THE ORTHOGRAPHIC CONVENTIONS OF MAYA HIEROGLYPHIC WRITING

BEING A CONTRIBUTION TO THE PHONEMIC RECONSTRUCTION OF CLASSIC MAYAN

SUBMITTED BY

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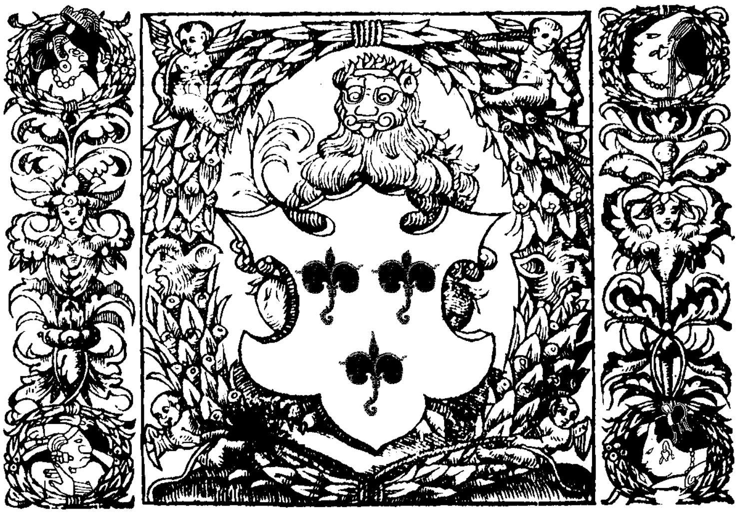

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Signature of candidate:

Sven Gronemeyer Melbourne, the 10th Day of October in the Year of 2014

SUMMARY

This ſtudy inveſtigates the orthography of Maya writing on an empirical and ſtatiſtical baſis. It reſtricts itſelf to the realiſation of certain grammatical morphemes that are ſelected as repreſentative ſhowcaſes. Furthermore, the queſtion of ſpelling alternations at the morphemic boundary between the root and grammatical ſuffixes are inveſtigated. The process of re-tranſferring the epigraphically atteſted grapheme ſtring back into a phoneme ſtring has proven to be an ambiguous process.

A ſtatiſtical aſſeſſment of the underlying repreſentational rules for grammatical ſuffixes needs to conſider both phonology and function. The epigraphic evidence is therefore firſt viewed againſt the linguiſtic data of relevant Mayan languages and before the background of hiſtorical linguiſtics. Baſed on previous epigraphic reſearch, hypotheſes can be formulated, how theſe grammatical forms can be repreſented in writing.

With this knowledge, ſamples are gathered from the hieroglyphic corpus. Theſe ſamples are ſubject to a three-tier analytical process: (1) linguiſtic analyſis and attribution with analytical parameters in a data baſe, (2) ſignificance teſts for ſpelling patterns and other methods from quantitative linguiſtics, and (3) diſcuſſion of the teſt reſults againſt the linguiſtic hypotheſes.

The teſts largely confirm ſpecific orthographic rules in a variety of environments. The rules alſo provide an important contribution to the vocaliſation of grammatical ſuffixes and therefore to the pronunciation of the Claſſic Mayan language. The ſpecification of ſtandard patterns alſo enables a better explanations of deviations. Thus, more light can be ſhed on a large range of aſpects: (1) language genealogy and geography, (2) vernacular influences, (3) ſocio-linguiſtics, or (4) ſcribal ſchools, to name only a few.

More confidence in a ſtandardiſed Claſſic Mayan orthography alſo foſters increaſed truſt in the vocaliſation of the language and ultimately more confidence to more correctly read and interpret hieroglyphic texts. It is one ſtep towards a conſolidated grammar of Claſſic Mayan.

Ἀρχὴ μεγίστη τοῦ βίου τά γράμματα.

Ariſtoteles

Ri ab'aj man e mem taj
xa kakik'ol ri kich'awem.

Humberto Ak'ab'al

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PREFACE

"One might sum up the whole sense of the book with the following words: what can be said at all can be said clearly, and what we cannot talk about we must remain silent on."
Ludwig Wittgenstein, 1953: Logisch-philosophische Abhandlung, Preface (author's translation)

MY FIRST THOROUGH INTEREST IN Classic Mayan orthography and the pronunciation of the Classic Mayan language was sparked when writing my Master thesis on the inscriptions of Tortuguero, Tabasco, Mexico in 2004 at the Rheinische Friedrich-Wilhelms-Universität Bonn (Gronemeyer 2004). During the writing, I analysed the whole corpus of the site with some of the – at this time – latest theories and insights concerning Maya hieroglyphic linguistics. This allowed me to apply and test these against a closed inscriptional corpus and set the course for my future research interests.

In the summer semester 2004, I was invited to a research seminar entitled *Aktuelle Forschungen zu Schriftsystemen Mesoamerikas* (Recent Research on Mesoamerican Writing Systems), organised by Berthold Riese. There, I first presented further considerations on reconstruction models of the Classic Mayan pronunciation and hieroglyphic orthography, based on patterns from the inscriptions. These were (1) the use of acrophonic syllabograms as morphograms, (2) the integration of syllable-final vowels in spellings at morpheme boundaries, and (3) a critical assessment of the so-called morphosyllables (Houston, Robertson and Stuart 2001b).

I further elaborated the last aspect over time and presented my interpretation in a talk at the *XII Mesoamerikanisten-Tagung* (Mesoamericanist Meeting) in Bonn in February 2009. Fruitful discussions afterwards and a kind invitation by *Indiana* editor Gordon Whittaker (Georg-August-Universität Göttingen) yielded a publication (Gronemeyer 2011b) of my line of arguments. Criticising the morphosyllabic approach at the same time calls for a model that is driven by cenemic spellings as per my second consideration of hieroglyphic orthography.

With my application at La Trobe University and the acceptance of my candidature and scholarship offer in December 2010, I received the grateful opportunity to continue my research on the topic in splendid isolation, with many genuine 'Australian Grown' ideas to finalise the present thesis.

"It's been a long road,
Getting from there to here.
It's been a long time,
But my time is finally near.

And I will see my dream come alive at last,
I will touch the sky.
And they're not gonna hold me down no more,
No they're not gonna change my mind.

'Cause I've got faith of the heart,
I'm going where my heart will take me.
I've got faith to believe,
I can do anything.
I've got strength of the soul,
No one's gonna bend or break me.
I can reach any star, I've got faith,
I've got faith, faith of the heart.

It's been a long road."

Diane Warren, 1999: Faith of the Heart, performed by Russell Watson, 2001

READER'S ADVICE

"Repetition is the mother, not only of studying, but also of learning."
Jean Paul Friedrich Richter, 1807: Levana oder Erziehlehre, §7 (author's translation)

THE PRESENT THESIS IS THE RESULT of a task carried out over the course of several years. It is the outcome of an initial idea that had to be adapted over the course of the research, as knowledge deepened and the field developed. The content of the present work and its structure reflects this process. As it is the primary goal to present the research and its realisation as transparent as possible, some preliminary notes are in place.

Of course, the work follows a consistent, modular format that reflects the way of stringent scientific work: illustrate and analyse the problem based on the current research, formulate desiderata, define an apt methodology to approach the problem, formulate hypotheses and test the data against them before coming to a discussion, evaluation and conclusion. In the end, the outcome is new knowledge to advance the field.

The topic of the thesis is extremely complex, tangling a variety of subfields of Maya studies. The focus is primarily laid on epigraphy and comparative linguistics. But a better understanding is reached by including archaeology, ethnohistory, ethnography, sociolinguistics, linguistic typology, quantitative linguistics, graphematics, and even cross-cultural perspectives from disciplines like Egyptology or Assyriology.

In order to cope with the vast amount of information, this study makes intensive use of footnotes to provide in-depth details. As such observations are applicable in a variety of contexts, cross references are made wherever possible, also for remarks in the main body of text. This is made in order to reduce repetitions. However, some reiteration of thoughts and remarks is necessary. Tentative conclusions picking up certain points are an apt way to subsume interim results, reassure the further course and keep the overall objectives in mind, especially for the reader.

Both, intermediary summaries and cross references, are also used to break up the linear structure that is inherent to a thesis and provide some 'hypertextuality'. This should not be considered as a weakness in the argumentative flow. This study is also intended to be a compendium on the topics discussed, summarising repetitions will provide the reader seeking an overview with concise information, but at the same time guide those looking for detailed information into the right direction without the necessity of a linear reading. Therefore, the 'core' of the thesis, the hypotheses, analyses and discussion try to replicate a certain, repetitive structure for easier access to a specific topic, i.e. a specific showcase. Finally, this approach will also solidify certain arguments and support the aim of the thesis to be an extensive grammar (though still limited in scope) of Maya hieroglyphic writing, reflecting the complex nexus of language.

Best efforts have been undertaken to provide credit to whom credit is due. This above all concerns the citation of published sources, but also the acknowledgement of personal communications in whatever form, and the use of unpublished materials. No one can be aware of any argument, thought, decipherment, etc. – especially those that abstain from publication. Unless credit is provided, all thoughts remain my own, and they may occasionally result in conclusions independently arrived at, without knowingly neglecting the intellectual achievement of others. This also leaves all errors and fallacies in this study in the author's sole responsibility.

A final note concerns the credits for the line drawings of hieroglyphic examples, especially in Chapter 4. In order not to inflate the image captions, in-text citation of the source is regularly omitted. A proper attribution to a publication or the artist is nevertheless provided by the sample's data base entry in Appendix C3. In case the reference points to a photograph, the drawing is by the author.

Acknowledgements

> "[N]os esse quasi nanos, gigantium humeris insidentes, ut possimus plura eis et remotiora videre, non utique proprii visus acumine, aut eminentia corporis, sed quia in altum subvehimur et extollimur magnitudine gigantea."
> *John of Salisbury, c. 1159: Metalogicon, Book III, Chapter 4, 46-50*

Firstly, I would like to graciously reciprocate to my principal thesis supervisor and friend Professor Peter Mathews. He was ever helpful and supportive to my research and often encouraged me to carry on when there was case of doubt or the task seemed too overwhelming. Always having an open door, it was a great pleasure to participate in his incredible knowledge of Maya studies and his enthusiasm in Aussie rules football (yes, we are Geelong!). Peter, it was an honour to be your student and even more to be the last official PhD candidate in your extraordinary, long, and fruitful academic career. Thank you for having been a beacon at the starting point of mine.

I would also like to acknowledge Professors Tim Murray as my replacement principal supervisor, after Peter was conferred emeritus status, and David Frankel and Steven Falconer as my co-supervisors. All likewise encouraged me with my project. Especially Tim, as the faculty's Executive Dean, supported me against all odds of such a complex term research task. The staff of the Archaeology Program and the School and Faculty offices at La Trobe University also deserves credit for ever helpful support. Unneeded to say that without the gracious granting of the Australian Postgraduate Award, the La Trobe International Postgraduate Research Scholarship and a 'Top-up Award' of the Faculty of Humanities and Social Sciences, Melbourne might have remained the far side of the world to me. Professors Elizabeth Graham (University College London) and Harri Kettunen (Helsingin Yliopisto) kindly supported my application with letters of recommendation.

I am, besides my supervisors, also indebted to the reviewers of La Trobe University for my field research application that was accepted in December 2011. It enabled me a stay in Guatemala and Belize between May and July 2012, during which I was able to document additional hieroglyphic texts that became part of my database of spelling samples that I analyse in the present thesis. I also thank Tim Murray and acting Head of School Adrian Jones for endorsing my scholarship extension in January 2014 to take a bit of pressure from my chest on the last mile of completion.

I also specifically acknowledge my La Trobe University alumni colleagues Péter Bíró and Carl Callaway for their support. It was Carl who actually 'advertised' the candidature to me when we encountered in Guatemala City in May 2010. Both Carl and Péter were helpful with practical matters on and off campus, before and during my stay in Melbourne. Needless to say they were also valuable discussion partners for the thesis topic.

Many other specific thanks need to be uttered: for criticism, support, ideas, thought exchange and all the processes of an academic discourse that were somehow related to my thesis topic. Hopefully, this leaves all remaining errors and misunderstandings as mine. For their time to muse about my thoughts, or for being a deliberate or unaware donor of ideas and information, or an 'enabler' for materials (especially from archives and in the field), I acknowledge (in alphabetical order): Dmitri Beliaev, Erik Boot, Robert Carr, Rita Casas, Michael Coe, Luís Colmenares, Albert Davletshin, Markus Eberl, Andreas Fuls, Oswaldo Gómez, Jenny Guerra, Christophe Helmke, Nicholas Hopkins, Kerry Hull, Paul Johnson, Milan Kováč, Guido Krempel, Alfonso Lacadena, Barbara MacLeod, Sebastián Matteo, Karl Herbert Mayer, Raúl Noriega, Iken Paap, Carlos Pallan, Yuriy Polyukhovych, Christian Prager, Maríbel Ramírez, Dieter Richter, Frauke Sachse, Ivan Šprajc, Raphael Tunesi, Elisabeth Wagner, Gordon Whittaker, Søren Wichmann, Ulrich Wölfel, Marc Zender, and Jarosław Źrałka. From these persons, Ulrich Wölfel deserves a special recognition for his support with the mathematic model for the database and the significance test. In this respect, I was just a blind man in a dark room looking for a black cat which he found. Acknowledgements also need to be made to many people who have mentally supported me through three years of blood, toil, tears and sweat. How can I ever reward my coffee maker?

The most gracious gratitude is reserved to my parents, Karl-Heinz and Monika, who also made everything possible for living in a land down under and enable me a pleasant waltzing in Melbourne with more than just a Matilda. I honour their respect to my decision. I also shall not forget to remember my brother Jens and his wife Martina who hadn't seen me for long. And of course my nephew Nils Heinrich who was always curious about the doings of his 'explorer uncle' and whom I wasn't able to see growing up in the past three years or how he started school.

I remember André and Holger, my lifelong friends who formed the honour guard upon my leave at Frankfurt Airport back in March 2011 and other good friends (and sometimes more) I had to abandon for and during the candidature, some only temporarily, some forever: Andrea, Annamaria, Dirk, Edda, Florian, Jessica, Katarzyna, Natalie, and Wencke. But as we say in the Colognian Rhinelands: *Et es wie et es; et kütt wie kütt; watt fott es, es fott; denn nix bliev wie et wor – also watt wellste maache?* But above all, *echte Frönde in dr Nut* remained. Without those, I would have been Doctor Who without his TARDIS.

It is my parents that I bestow my thesis upon and that with its submission and the completion of my candidature I shall return victorious, happy, and glorious. After three years in Australia, I do with a tucker-bag full of memories, while a part of mine continues to camp under the shade of the coolibah tree that grew during my candidature.

Äävernu komm isch zo Hus, in ming Heimat, an dä Rhing, däm jraue Strom.

But… No matter how far or how wide I roam: I still call Australia home…

Melbourne / Halver / Bonn / Flores
August 2014

Meinen lieben Eltern in großer Dankbarkeit

1 – INTRODUCTION

"Is the Maya writing phonetic? … This statement I firmly believe I can maintain…"
Cyrus Thomas, 1892: Science, XX(505) p. 197

THE PRESENT STUDY WILL INVESTIGATE to what extent certain orthographic principles of Maya hieroglyphic writing can contribute to the reconstruction of the Classic Mayan language[1]. Above all, the focus of the thesis will be laid upon the spellings of grammatical morphemes suffixed to a root. The question is how vowel initial suffixes are realised in the hieroglyphic script and if there are orthographic rules to indicate a proper pronunciation and grammatical function of these suffixes. This may sound easier than expected. But in fact, recent orthographic hypotheses on vowel disharmony (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004, Robertson et al. 2007), morphosyllables (Gronemeyer 2011b, Houston, Robertson and Stuart 2001b) and the suffix domain (Lacadena and Wichmann 2005b, Mora-Marín 2003a) have produced numerous approaches. The thesis will critically review these approaches and propose a model of vowel integration at morphemic boundaries to be tested against the epigraphic data.

In the following, I will further outline the topic of this study and provide an overview of the current state of research. By comparison of our current knowledge with the thesis topic, I will be able to formulate the desiderata and therefore the aims of what the thesis intends to achieve.

1.1 – Topic Outline

DURING THE LATE PRE-CLASSIC PERIOD, the Maya were among the very few civilisations of the Americas to develop a writing system that was capable of phonemically denoting a language. Its roots (Justeson et al. 1985: 31-37) may reach back into the yet unclassified script of Kaminaljuyu (Mora-Marín 2005a) which is, according to some scholars (e.g. Kaufman and Justeson 2001: 30-31), a bridge between the Epi-Olmec script and the later Lowland Maya or more likely a predecessor or the same to the latter (Justeson and Mathews 1990, Mora-Marín 2005a: fig. 5, 80-83,

[1] The term 'Classic Mayan language' or 'Classic Mayan' for short will be used throughout the thesis as a *terminus technicus* to refer to the language(s) denoted by the hieroglyphic writing system. Houston, Robertson and Stuart (2000) have introduced the term "Classic Ch'olti'an" to characterise an ancestral form within the Eastern Ch'olan branch (2000: 327) to be represented in the inscriptions. However, criticism has been raised on this attribution (Mora-Marín 2005b, 2009, Wichmann 2002a, 2006a: 280-284). It also shades the influence of vernacular languages, such as from the Yukatekan and Tzeltalan branches (Lacadena and Wichmann 2002, 2005a, Wichmann 2006a: tab. 1) that exist in the inscriptions. As language is never static, the script must also represent different development stages of the language(s) written by the hieroglyphs over the course of more than 1,500 years, as it has been demonstrated for the verbal system (Houston, Robertson and Stuart 2000: 329-334). Although the general affiliation with the Ch'olan branch from its proto-Ch'olan ancestry (Kaufman and Norman 1984) over Colonial stages (e.g. Smailus 1973, 1975) until modern languages is beyond doubt, I will rather apply 'Classic Mayan' to neutrally subsume the totality of hieroglyphic language(s) in a diachronic perspective and acknowledge its permeability with vernacular influences. See also Chapter 1.2.2.3 for an overview.

Prem 1973: 48). There are traces in the Kaminaljuyu script that point to a precursor of the Ch'olan branch (Grube and Martin 2001: 26, Mora-Marín 2005a: 75-79), based on logo-syllabic readings; hence we find phonemic writing (of a still unconfirmed extent) here. Epi-Olmec (or Isthmian) writing (Justeson and Kaufman 1993, Kaufman and Justeson 2001, Mora-Marín 2010c) is denoted by a logo-syllabic system und supposed to represent a Proto-Sokean language which may be another precursor (cf. Lacadena 2010b). However, an application of the decipherment proposal by Kaufman and Justeson (2001) to a previously unknown text (Houston and Coe 2003) has failed to provide a valid reading, so Epi-Olmec writing, its system and language must remain unknown.

a b c d e

Figure 1: Examples of Maya writing through times. **a)** Pre-Classic: San Bartolo Las Pinturas Sub-V text (Reuters/Daniel LeClair), **b)** Early Classic: Tikal Stela 31, K1-L4 (Sven Gronemeyer), **c)** Late Classic: Palenque Temple XIX Pier, R1-R4 (Sven Gronemeyer), **d)** Post-Classic: Codex Dresden, p53 (Sächsische Staats- und Landesbibliothek Dresden), **e)** Colonial: The Landa-Alphabet from the *Relación de las cosas de Yucatán*, MS f. 45r (Biblioteca de la Real Academia de Historia Madrid).

Other Mesoamerican writing systems (Houston 2004), such as Teotihuacan (Berlo 1989, Cabrera Castro 1995, 1996a, b, Davletshin 2010, Nielsen and Helmke 2008, Taube 2000), Cacaxtla (Helmke and Nielsen 2011), Zapotec (Caso 1965, Marcus 1980, Urcid 1992, 1998, 2001, 2005, Whittaker 1992), Mixtec (Anders and Jansen 1988, Jansen and Pérez Jiménez 2000, Smith 1973, 1983, Troike 1978: 559-562), or Aztec (Aubin 1885, Lacadena 2008a, Nuttall 1888, Prem 1992, Whittaker 2009, Zender 2008) have not reached this level. Many have remained in a state of applying mnemonic and rebus principles or through pictorial information. The Aztec writing system is an interesting case in this respect, as its system of spelling anthroponyms and toponyms, but also other 'emblems' (Fedorova 2009: 260), has long been recognised (Aubin 1885). It has been termed a "restricted system" (Prem 1992: 54-55) and can be understood as a special semiotic case between ideography and phonography or a textogram as the combination of narration and description (Fedorova 2009: 259). The phoneticism of Aztec writing is still under debate (Lacadena 2008b: 17), but recently it has been proposed that there was an Aztec syllabary (Lacadena 2008a, b, c, Zender 2008), going back to an idea by Aubin[2]. Yet, we find morphograms and phonograms in Aztec writing (Whittaker 2009: 59), but of a far more complex and irregular structure than in Maya hieroglyphs (Whittaker 2009: 60-72). As in Maya epigraphy, a discussion is going on whether long vowels were represented in the script (Lacadena and Wichmann 2008) or not (Whittaker 2009: 59).

The probably earliest clear trace of writing we have from the Maya lowlands was recently discovered on a painted mural in the site of San Bartolo, Peten, Guatemala (Houston 2006, Saturno, Stuart and Beltrán 2006), dating to the 2nd or 3rd century BC. Of about the same time (ca. 450-350 BC [Mora-Marín 2005a: 64]) are a text from El Portón, Baja Verapaz, Guatemala (Sharer and Sedat 1987: 49-73) and an altar from Tak'alik Ab'aj (Schieber and Orrego 2009); a bit later, around 100 BC, an inscription from El Mirador, Peten, Guatemala (Hansen 1991). The script flourished in the Early and Late Classic, it survived the collapse in the Post-Classic codices and it was still known in Early Colonial Times (Landa 1959: 104-106). Likely, hieroglyphic codices were still produced in Colonial times (Chuchiak 2004), hieroglyphic knowledge was perpetuated, partly as a resilience strategy (Chuchiak 2010), before it slowly faded. Vestiges persisted in the *Chilam Balam* books written in Latin script (cf. Bricker 1989, Gunsenheimer 2009), with the example of the Chumayel[3] compiled in 1782 (Gunsenheimer 2002: tab. 1, Roys 1933: 7), just 29 years before the Mexican independency. This provides at least 1,500 years of use until the arrival of the Spaniards (cf. Houston, Baines and Cooper 2003: 463-464).

1.1.1 – Phoneticism in Maya Writing

As any phonemic writing system, Maya writing combines a graphemic lexicon (Weingarten 2011: 17) with graphemic rules (Weingarten 2011: 18), or graphotactics. These allow both the author and recipient to establish a correlation between a phonemic string and a graphemic string.

As per the current research, the underlying orthographic rules exhibit several cases of ambiguities for the epigrapher. This led to a number of reconstructions when a sign string is transferred into a phonemic string during the analytical processes of transliteration and transcription[4]. Recent studies have delivered further results concerning the orthographic indication of phonemics within a lexeme, for example consonant deletion and underspellings (Zender 1999: 130-142) or the differentiating func-

[2] The compilation done by Aubin (1885) was taken as a basis to decipher new signs in different contexts, similar as Knorozov (1952, 1955, 1965) used the Landa alphabet to give way to the phonetic approach of decipherment in Maya writing (Zender 2008: 31). It is thus interesting that the proposal of a greater influence of phonemic signs in Aztec writing and their ordering in a CV-based matrix comes from Maya scholars.

[3] The Chumayel plays with a morphographic rebus principle, where the Yukatek denotation for the Arabic numerals is used in a non-numerical context (Bricker 1985, 2000b: 92-93, Edmonson 1976: 714), e.g. <*2n*> for *can*, "four" for <*at.5*> as *a t[i]ho'*, "at Mérida" (f. 9r). This is similar to modern uses like "4 sale". Other examples are the vignettes of the *K'atun* wheels (e.g. f. 39r), where the original *Ajaw* signs (cf. Landa 1959: 103) are replaced by Europeanised faces. Needless to mention the perpetuation of Classic Maya calendrics (Roys 1933: 3).

[4] One example is whether sounds reconstructed (by historical linguistics or by orthographic rules) shall already be indicated in the step of transliteration or only afterwards in the transcription. This led to transliterations of **K'AK'** for *k'ak'* or *k'a[h]k'* or **K'AHK'** for *k'ahk'*. Per my understanding, complex sounds are absent from the sign itself, and may only get indicated by orthographic rules, thus they should only be represented in transcription, when the sign string gets transformed into a phoneme string (see Chapter 1.2.3).

tion of the velar [x] and glottal [h] spirants (Grube 2004d). The orthographic rules and spelling practices, as far as known from an epigraphic point of view, are functionally explainable, but have only recently moved into the focus of a phonemic research on an empirical data basis, as for example disharmonic spellings (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004) or the indication of grammatical morphemes (Houston, Robertson and Stuart 2001b, Lacadena and Wichmann 2005b, Mora-Marín 2003a, 2010a). Others were just a matter of understanding, as demonstrable with the reading order of complex signs (cf. Orejel 1996: 76, fn. 3, Zender 1999: 95-97).

The increasing efforts in Maya epigraphy to obtain a full phoneticism of Classic Mayan is similar to Egyptology. Since its beginnings, the discipline applied an artificial and conventionalised scholarly pronunciation (Peust 1999: 52-56) for daily use. But recent research also started to focus on the vocalisation of the purely consonantal hieroglyphic script (Peust 1999, Schenkel 1997: ch. 13). Similar to Maya epigraphy and historical linguistics, Egyptology needs phonological reconstruction from several sources, like Coptic as the latest developmental stage of the ancient Egyptian language or by spellings of Egyptian words in cuneiform texts (Gardiner 1957: 428-433, Peust 1999: 16, Ranke 1910, Sethe 1923).

The present thesis will further pursue the phonemic reconstruction of the Classic Mayan language, taking it further from the latest insights from epigraphy and linguistics (Houston 2000, Wichmann 2006a). With a number of contributions on the phonemics and orthography of lexemes, I will concentrate on the spellings of grammatical morphemes and their interdependency at morphemic boundaries (Lacadena and Wichmann 2005b, Mora-Marín 2003a, 2010a).

1.1.2 – Phonological and Morphological Structure

Without going to much into the details in the overview, I will provide some of the basic features of the Classic Mayan language and writing system to sketch the research intent of the thesis. The graphematic and linguistic premises for this follow in Chapter 1.2.

The majority of lexical roots follows a *CVC*[5] pattern. The nature of the central vowel (*V*, *VV*, *Vh*, *V'[V]*) is currently supposed to produce minimal pairs of contrasting meaning in Classic Mayan (e.g. *chak*, "red, great" vs. *chahk*, "Rain God" or *ba'k* , "child" vs. *baak*, "bone, captive"), complex nuclei are still preserved in some modern languages (e.g. MOP [Schumann Gálvez 1997: 57]).

The majority of grammatical morphemes is realised by syllabograms of a **CV** or **ʔV** structure that are affixed to the root, following the agglutinative morphology (von Humboldt 1836: § 14, 119) of Classic Mayan. Except aspect markers and the set of ergative pronouns (Bricker 1986: 21-23), all other bound morphemes are realised as suffixes. Therefore, by their quantitative and functional abundance, grammatical morphemes are specifically suited for an empirical study. Their phonological structure furthermore makes them an interesting and insightful research subject with respect to the reconstruction of their vocalisation by means of the orthography, because they mostly follow a *–VC* pattern.

[5] See Chapter 1.2.3 for the analytical conventions of Maya hieroglyphic graphemes.

Hence, a purely syllabically realised sign string of a root plus a suffix features the structure **CV-CV=CV**, whereas a mixed morpho-syllabic[6] morpheme string can graphotactically be analysed as **CVC=CV**. Both cases can be transcribed and morphologically segmented as *CVC-VC*[7]. The assumption is that the second sign in the purely syllabic string might deliberately be chosen to spell the initial vowel of the suffix (Bricker 1986: 133, Justeson 1989: 35). As two consonants follow each other graphematically in the mixed spelling, the vowel would need reconstruction by the function of the suffix indicated. Syllabic substitutions or phonemic complementation might provide a clue in these cases, especially when there are allomorphs for one suffix (e.g. *–ib* ~ *–ab* ~ *–ub* for the instrumental). Morphosyntax and the syntactic category might also play a role, as a different suffix vowel can also produce a functional distinct suffix (e.g. *–il* for the abstraction of nouns vs. *–al* for the nominalisation of derived intransitive verbs).

It might have been in the interest of a Maya scribe to orthographically distinguish such cases for the recipient and provide sufficient orthographic transparency (Weingarten 2011: 16) to avoid any ambiguities. In contrast to the modern epigrapher, the ancient recipient was of course fully literate and anticipating an 'ideal' vowel based on the context, syntactic category, part of speech, or type of derivation (Gronemeyer 2011b: fn. 27).

If orthographical guidance was indeed practiced by the ancient Maya, patterns should evolve from the epigraphic analysis in the cases where signs are spelled at morpheme boundaries. Potentially and specifically in the cases of mixed spellings, the selection of a certain syllable was made to at least indicate the absent initial vowel. All this must be considered against the normal spelling of the single root and the disharmonic principle considered to indicate complex vowels (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004, 2005b, Robertson et al. 2007).

With an empirical analysis and statistical methods and aided by comparative and historical linguistics, I will pursue this question in the present thesis. The exact outline will be detailed in Chapter 2. This thesis will hopefully contribute to an improved grammatological and typological understanding of the writing system, as well as a better phonological and morphological perception of Classic Mayan, its genetic affiliation to other Mayan languages and less ambiguity in future epigraphic studies.

1.2 – Current Research

THIS SYNTHESIS WILL NOT ONLY contain problems related to the thesis, but also a summary of the premises the study is based on. This chapter will already outline some of the debated approaches in Maya epigraphy and contrast the positions brought forward by numerous authors in order to formulate the aims of my research. Specific questions and aspects of our current under-

[6] Here, morpho-syllabic refers to the writing system typology and is not to be confused with the morphosyllabic sign class proposed by Houston, Robertson and Stuart (2001b). See Chapter 1.2.1.2 below.

[7] The final vowel of a syllabogram remains voiceless in transcription and reading unless it spells a *–V* / __# suffix, see Chapter 2.1.4 for some examples.

standing will be repeated, brought forward and elaborated in Chapter 2 to build the methodological skeleton.

To provide a consistent language throughout the thesis, I will first define a terminology and the formal and functional criteria (cf. Gronemeyer 2004). This will be done for graphematics and linguistics.

1.2.1 Grammatology

1.2.1.1 – Inscriptional Premises

The terminology applied here bases on Riese (1971, 1980) and Kubler (1973), and breaks down the epigraphic source material into hierarchical categories. Revisions have been made to better fit to the orthographic and linguistic purposes of this study.

The *corpus of hieroglyphic inscriptions* is the sum of all written sources known to date. In elaboration to Riese (1971: 37-38, 1980: 3), I will apply this term to all Maya inscriptions, whereas I refer to a *site corpus* as a sub-category that contains the written sources of a specific archaeological site, including those objects of unknown provenance which can be attributed to a site corpus by contextual criteria.

An inscription can be broken down into several hierarchical units. All hieroglyphs on an object are called *text* (Riese 1980: 3), whether in one or more fields. Perhaps, a text needs to be reconstructed by a critical analysis (Riese 1971: 145-149). The *paragraph* is a thematically coherent piece of information which can be within one field or distributed over several fields on the object (Riese 1971: 209). The part of a text introduced by a calendrical information (Riese 1980: 4) is called a *phrase* and can be ranked by starting with an Initial Series, Distance Number or Calendar Round. Calendrical information not only help to structure a text (Bricker 1986: 183, Gaida 1983: 4-5), they also indicate if the phrase is contemporary, prospective or bygone[8].

The *clause* is a syntactical unit that comprises of the constituting elements of a sentence and is therefore congruent with it but without applying the pragmatic layer of a sentence. This nucleus can be expanded with subordinate phrases. In contrast to Riese (1980: 4), recent research shows that a clause can very well combine calendrical and non-calendrical information. If there are clauses with unknown semantic or grammatical information, they cannot be further structured (Gaida 1983: 5)[9].

The physical unit of a group of signs in a mostly rectangular shape is called *glyph block* or *collocation*. It is divided by small spaces in between (Bricker 1986: 1, Zimmermann 1956: 8). Within a block (and often congruent with it), a *hieroglyph* or *glyph* is the graphical unit of one or more signs (Bricker 1986: 1, Riese 1980: 4). It can also be called a *sign string* as well, as on the linguistic level it denotes a

[8] This information is important for two reasons. The contemporaneity or anteriority of an event (less often its happening in the future) determines certain grammatical morphemes. Events from a distant past sometimes apply ancient forms in the script that need to be filtered in the analysis, hence dating of an event is important.

[9] For the thesis, it is important to know the syntactical function of a specific part of a clause, hence this can further determine the function or the phonemics of a grammatical morpheme.

morpheme string (a lexeme plus bound morphemes) and thus ultimately a *phoneme string* (the sequence of individual sounds)[10]. Beyer (1937) has shown the structural approach of how to define a glyph.

The *sign* or *grapheme* is the smallest graphical unit of information and therefore to carry meaning (Riese 1980: 4). Graphemes are distinguished by subgraphemic details (diagnostic attributes). Graphemes can be defined by two logically separated ways to be explained below.

1.2.1.2 – Graphematic Premises

Before coming to speak on the graphematics of Maya hieroglyphs, it is appropriate to clarify some general definitions first (Coulmas 1989: 37-39, Weingarten 2011: 12-17). It is spoken of a *script* when referring to a prototypical set of graphemes that are emanations of a typological *writing system*. For example an alphabet is a writing system, among the alphabets we find the Latin, Greek, Cyrillic, etc. scripts. The combination between a specific language and a specific script is also referred to as a *writing system* (Coulmas [1989: 39] refers to this as orthography, a term too narrow especially when speaking of non-alphabetic scripts).

Graphemes can be classified by formal criteria on a formal basis (Gates 1931: ix-x) by sign catalogues (Macri and Looper 2003b, Thompson 1962). The criteria emerge from the size and position of signs within a glyph (block), thus it is a *representational rule* (Weingarten 2011: 18).

Following Thompson (1962), *main signs* are those of a fairly quadrangular form (Riese 1971: 164, Thompson 1962: 10) and of a relative bigger size compared to *affixes*. These are usually more rectangular and are attached to the periphery of a main sign (Zender 1999: 92-93). According to their position (Riese 1971: 165), they are called *prefix*, *superfix*, *postfix* and *subfix*.

There are more complex graphotactic possibilities besides these affixation patterns to constitute sign strings. These are (1) *infixation* (embedding a sign into another [Zender 1999: 94]), (2) *conflation* (amalgamation of the diagnostic features of two signs [Zender 1999: 95]) and (3) *superimposition* (overlapping of a complex sign with another [Zender 1999: 95-97])[11].

There are no functional differences between main signs and affixes (Grube 1990a: 34). The sign catalogue by Macri and Looper (2003b) used in this study therefore abandoned this differentiation, but I will retain it whenever it is useful to describe the position of a sign in a glyph (block).

The graphotactic possibilities to form a sign chain from a single glyph to a whole text request the question of the reading order (Riese 1971: 25-27, Zender 1999: 83-91). Texts are usually read in double columns (Riese 1971: 27), deviations are to clarified by a structural analysis (Riese 1971: 28-31). The

[10] The glyph will therefore be the key unit of analysis in the study. Hopkins (1968) was among the first to propose a structural approach to correlate language with sign strings. By the process of transliteration, transcription, morphological segmentation and analysis, the data necessary for the testing of the hypotheses will be gained.

[11] In contrast to graphematics (Weingarten 2011: 18), a complex sign in Maya epigraphy consists of more than one part from which the affix portion can stand *pars pro toto* for the whole sign (Houston 1988: 130). I will retain this definition and otherwise refer to the combination of signs in the graphematic sense as a *relational unit* (Zender 1999: 74-75), see also Wald (2007: 141-147)and Knowlton (2002: 12-13) for a case study.

method of how to determine the reading order within a glyph (block) has been worked out by Riese (1971: 155-157, 158-160).

Another classificatory system for graphemes is functional and linguistically determined. The nature of the writing system defines three groups (Bricker 1986: 4, Grube 1990a: 7-8, 13) that are generally accepted. Two other groups are currently under debate. The three basic expressions of the Maya graphemic lexicon (Weingarten 2011: 17) are (1) *syllabic signs* or *syllabograms*, (2) *word signs* or *morphographs* (as free graphemes) and (3) *diacritics* (as affigated graphemes). The Maya script encoding the Classic Mayan language can thus be classified as a morpho-syllabic writing system (Weingarten 2011: 16-17). With script typologies becoming more granular (Weingarten 2011), some refinement also needs to be made for Maya writing (cf. Wald 2007: 34-40) together with some explanations according to the definition.

A syllabogram (Knorozov 1952) denotes the phoneme string **CV**, including the 'vowel signs' of the structure **ʔV**, thus syllabograms are always light[12], i.e. they have an onset, but are coda-less. Many syllabograms are apparently acrophonic derivations[13] of the signified (Campbell 1984: 12-13, Grube 1990a: 72-73, Justeson 1989: 32-34, Lacadena 2010b: 32-34, Mora-Marín 2003b: 202-216, Zender 1999: 38-41). They build up words and can have morphemic properties. They are the smallest indispensable unit in Maya writing and generally in phonology (Blevins 1995). Syllabic signs can also be used as redundant *phonemic complements* to indicate the reading of morphographs (Grube 1990a: 25-26, 63-69, 2010, Mora-Marín 2008: 198-200), especially polyvalent ones[14].

A morphograph denotes in a sometimes ideographic manner a lexeme and a phoneme string of the structure **CVC** (and the 'vowel initial' **ʔVC**), but also lexicalised derivations of the form **CVCVC**. In some cases, morphographs also spell bound morphemes[15] of the structure **CVC**.

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[12] Syllabograms have sometimes also erroneously been taken as moraic signs (Rogers 2005: 235), but syllable weight has not been recognised in Maya writing so far. Japanese in contrast has each grapheme to correspond to one mora, thus heavy (bimoraic) syllables are spelled by two graphemes (Honda 2007, Ratcliffe 2001: 5-6).

[13] In this sense, the Maya syllabary seems evolutional similar to Japanese (see below). Japanese chose not to introduce graphemes for heavy syllables (Ratcliffe 2001: 10), and a similar approach for Maya writing (Wichmann 2002b) has not found acceptance.

[14] Picking up a suggestion by Whittaker (2009: 56-57), syllabograms to distinguish polyvalent readings should consequently be termed *phonemic indicators*. This is also in congruence with other writing system descriptions (e.g. Foxvog 2010: 10).

[15] Stuart (Stuart, Houston and Robertson 1999, II: 70) was the first to suggest the term *morphograph* for this sign class instead of the traditional *logogram* (cf. Zender [1999: 34-35] for a discussion). In contrast to the traditional view (Gelb 1952: 250), I also follow recent definitions that emphasise the semantic component of a morphograph superior to the pronunciation (Daniels and Bright 1996: xlii, Taylor and Taylor 1983: 20-21). A morphograph furthermore acknowledges that a morpheme does not necessarily need to be congruent with a lexeme, as implied by the term logogram (Gnanadesikan 2009: 7). When referring to morphographic systems, Chinese (Coulmas 1989: 91-110, DeFrancis 1989) and Japanese (Coulmas 1989: 122-133, Joyce 2011) are often cited and an excursus to Japanese might be appropriate to rectify the shift in terminology. Japanese is adequate, as it knows a syllabary (五十音 *gojū on*) of the 平仮名 / ひらがな *hiragana* and 片仮名 / カタカナ *katakana* forms along the morphographic 漢字 *kanji*. With the application of 振り仮名 / ふりがな *furigana*, a principle similar to phonemic complements for entire words is used. In Chinese writing (DeFrancis 1989: 98, 115-116), from which the *kanji* are borrowed, one sign class combines a phonetic determiner and a radical (部首 *bù shǒu/bushu*) as a semantic determiner. Chinese refers to this as 形聲 *xíng shēng*, "form and sound", Japanese as 形声文字 *keisei moji*, "phonetic compounds" (Joyce 2011: 61). In Japanese, the sign 寺 <ji>, "temple" serves as the phonetic part to spell 時, "hour", 持, "to have, own" or 侍 "to serve, attend on" (Joyce 2011: tab. 1). Both determiners form an

indispensable unit to uniquely represent a pleremic unit or morpheme and are thus a morphograph. *Kanji* is morphographic, because "the orthographic units represent morphemes, the minimal units of meaning in the language" (Joyce 2011: 69). More than 90% of all Japanese (and Chinese [DeFrancis 1989: 100]) lexemes belong to the class of phonetic compounds. Of course, meaning itself does not derive from a semantic indicator, so Mayan still can be described as morphographic despite the fact it lacks classifiers and determinatives (see below). As Japanese is an agglutinating language like Classic Mayan, we can observe similar evolution. With the 万葉仮名 *man'yōgana*, *kanji* were used as purely phonemic signs (借音 *shaku on*, "borrowed sound"), before the cenemic *hiragana* were developed out of simplified *man'yōgana*. The *hiragana* have two important functions. One is as 送り仮名 *okurigana* to spell the affixes of a lexical root (Joyce 2011: 70, fn. 7), as in 高くなかった <takai-ku-na-ka-CL-ta> for *taka-una-katta*, "it was not high", or as a phonemic indicator for polyvalent *kanji*. The other use is similar, here *hiragana* are used to indicate whether a *kanji* is used in a Sino-Japanese (音読み *on yomi*) or genuine Japanese (訓読み *kun yomi*) pronunciation (Joyce 2011: 62-63). In these general terms, Japanese shows a clear distinction between its pleremic and cenemic components which nevertheless complement each other in the overall system (Joyce 2011: 74). *Man'yōgana* came out of use and full phonemic spellings by *kana* with or instead of *kanji* are only made with rare morphographs or foreign words or names (e.g. ヨハン・ゼバスティアン・バッハ <yo-ha-n ze-ba-su-te-i-a-n ba-CL-ha> for *Yohan Zebasuteian Bahha*, "Johann Sebastian Bach"). Japanese has thus quite similar abilities as Mayan, but is more restricted in the application where Mayan is more versatile in mixing morphographic with syllabic spellings. The parallel between the Japanese and the Maya system is also interesting from a general point of view on script formation. As Daniels (1996: 585) suggested, the emergence of writing in Sumer, China and the Maya area was because most lexemes are monosyllabic. Criticism (Joyce 2011: fn. 6) has been raised that the unit to consider should be the morpheme, not a phonological unit. This is true with respect to Chinese (DeFrancis 1989: 116, Hannas 1997: 176) as an isolating language where no cenemic signs are needed. Sumerian (Edzard 2003, Poebel 1923: 35, § 98) and Classic Mayan are both agglutinative. The necessity to indicate grammatical morphemes forced the development of a syllabary out of morphographic signs, as did Japanese via the *man'yōgana*. Also, the assumption that Chinese, Sumerian and Maya have a much higher percentage of homonyms (Joyce 2011: fn. 6) is not necessarily true (for Chinese cf. Hannas 1997: 181-182), and in fact the problem is avoided by semantic indicators to avoid homographs. This also argues against the application of the morphosyllabic principle of Chinese in Maya writing (Gronemeyer 2011b: fn. 4), if a morphosyllable (as a grapheme) would have meaning (i.e. indicate a function), it would need to be distinguished from homophonous signs. In contrast to at least Japanese with its clear *kanji/kana* separation for free and bound morphemes, Maya writing got one step further towards a full phonographic system at least in the Late Classic by also using morphographs to write bound morphemes. Currently, only one morphographically realised inflectional morpheme is known (**TAK** as a plural marker [Stuart, Houston and Robertson 1999, II: 25]), possibly a second one (**OB** as another plural marker [Stuart 2005c: 54, Stuart, Houston and Robertson 1999, II: 26]), although the latter's existence is speculative and functionally difficult (Gronemeyer 2011b: 325). Too little is known about plural marking in Classic Mayan (e.g. count nouns vs. mass nouns, animate vs. inanimate nouns, inclusive vs. exclusive [Campbell, Kaufman and Smith-Stark 1986: 550, Frankle 1985, Vázquez Alvarez 2002: 74-85]), thus the meaning (i.e. functional use) may not be specified by the sign itself (Gronemeyer 2011b: fn. 4). The sign ZS5 **TAK** is also seldom used as a homograph in nominal phrases (e.g. CNC P. 1, J1, J10, K9, O8 in *Itzam Ahk Wi' Takin? Chay* [Guenter 2003b: 11, Kistler 2004: tab. 1], and PAL T19B-W, N1 in *Yax Takin?* [Stuart 2005b: 131-133]). The phonemic complementation with **ki** proves the reading, the **na** might be used to spell *takin*, "dry" (cf. Wald 2007: 137). Another well known example of a morphographically spelled morpheme is **NAL** as the locative suffix *–nal* (cf. Stuart [1998: 380] for a possible etymology, Stuart and Houston 1994: 21-23). Lexicalised derivations of a fossilised meaning as **BALAM** add another level of complexity, but were obviously not morphologically segmented as such by the Maya scribes (Zender 1999: 34-35). Another phenomenon might also argue for a more phonographic use: The admittedly rare phonemic use of morphographs within a morpheme (often called 'rebus' in emphasising the system's morpho-syllabic nature). Good examples are **chi-LAM** < *chi[h]lam*, "interpreter" (SBP HS. 1 II, B66a), **K'UH-tzi** < *k'uhtz*, "tobacco" (C Dr. 15a), where the morphograph is likely used to denote the aspirated vowel, although this question still needs to be clarified (Lacadena and Wichmann 2004: 147, Robertson et al. 2007: 35, 45), as well as with **UH-ti=ya** < *uht-Ø=iy*, "it happened" (TRT Mon. 6, I2 [Stuart and Houston 1994: 45]). Another instance may be **NAH-wa=ja** < *na<h>w-aj-Ø*, "it was adorned" (PAL T18S, A5) where the morphograph (if not used acrophonically as **na**) may indicate the passive infix (Lacadena 2004b: fig. 7.5b, Wichmann 2004b: 80). There are occasions where a morphograph overspells one or more (grammatical) morphemes, as in **AK'=TAJ**$^{\text{ja}}$ < *a[h]k't-aj-Ø*, "he dances" (DPL HS. 4 Step I, I2), **K'UH=HUL** < *k'uh-ul* (e.g. SBL St. 8, A5a) or in **IL=NAH** < *il-n-a[j]-Ø*, "it was seen" (MQL St. 3, G3b), likely with the distinction of the spirants already lost (Grube 2004d: 79-81). See also the footnotes about homophony and polyphony below.

Diacritics, often referred to as semantic determinatives[16] in the older literature (Riese 1971: 23), are markings or signs attached to another grapheme to indicate a separate phonetic feature (Zender 1999: 41-45, 99-100).

The first of the currently debated classes are the *morphosyllabic signs* (Houston, Robertson and Stuart 2001b: 14). Their basic principle is the inversion of the syllabic phoneme string to **VC** to denote rather than indicate grammatical morphemes, being a hybrid of syllabograms and the traditional logograms (Houston 2004: 305). However, their concept is based on a misplaced transposition from the Chinese morphosyllables (DeFrancis 1989: 115-116)[17], accepting an artificial phonemic split in the smallest unit of Maya writing, the syllable (Gronemeyer 2011b: 320, fn. 4, Wichmann 2006a: 286-287)[18]. Morphosyllabic signs will not be applied in this study, specific critique (Gronemeyer 2011b, Wald 2007: 153-176) will be risen in the methodology and where appropriate in the analysis.

Recently, *semantic classifiers* and *semantic determinatives* have received a limited reappraisal in the literature (Mora-Marín 2008). Semantic classifiers, realised as subgraphemic details (Mora-Marín 2008: fig. 3), shall classify a sign into a semantic domain with an otherwise unambiguous reading. This idea has some appeal, although some more research needs to be done to further proof their existence and their patterns[19]. Semantic determinatives (Mora-Marín 2008: 201-207) are considered to be signs (or subgraphemic details) that semantically disambiguate homophonous phoneme or sign strings[20],

[16] Bricker (1986: 11) considered semantic determinatives to provide a pronunciation aid to polyvalent morphographs, which is rather the function of phonemic indicators. Following Zender's definition, diacritics determine less the semantics but rather actively indicate a phonemic value.

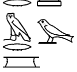
[17] As stated above, most Chinese morphemes are monosyllabic, and Chinese themselves refer to those signs that have a radical as the 形聲 *xíng shēng*, "form and sound". If form (i.e. the semantic part) gets replaced by 'meaning', it describes a morphosyllable.

[18] Morphosyllables were later (Robertson 2004b: 32-33) also considered as "iconic" markers for phonemically variable morphemes to under-represent their pronunciation. This again would require a phonemic inversion for a syllabogram (Houston, Robertson and Stuart 2001b: 14-15) and ignore the silent vowel of the final syllabogram. Also, if e.g. 2S2 **wa** would also be ****AW**, it should also function like that in other contexts (e.g. for 2SG.ERG *aw-*), the sign would become polyvalent. This is not the case. The same would be true for all allographs of a sign.

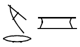
[19] The circular and the double-notched elements as human and animal markers have also been interpreted by Grube (personal communication, January 2003) as a marker for the absolutive status (especially for body parts [Zender 2004b]). The double-notched element is also problematic, as only a couple of species are marked with that element, and even in these cases not constantly. It has also to be pointed out that if a semantic classifier is to place the sign into a semantic domain (Mora-Marín 2008: 200), it should refer to the signified, as the signifier is detached in a morphograph.

[20] In this case, Egyptian writing is often utilised as a parallel. However, the nature of the Egyptian writing system with a much bigger influence of ideographic signs (Gardiner 1957: §§ 22, 25, Schenkel 1997: 38-40) is not entirely suited for comparison, as well as it was a logo-consonantal script omitting vowels. Different signs with the same set of radicals may point out the etymology, but ignore vocalisation (Sethe 1908: 37-39). I restrict to nouns, as semantically related verbs often have an underspelled weak consonant at the end (Gardiner 1957: § 20, Schenkel 1997: 81), e.g. *prj*, "come out" from *pr*, "house" (*verba ultimae infirmae*). I will use the two-radical noun *mr* that has four basic 'homophonic' meanings (translations by the author):

 "pyramid" (Erman and Grapow 1926-63, II: 94), *[mắr] (Schenkel 1997: 328)

 "to be ill, painful, illness" (Erman and Grapow 1926-63, II: 95-96)

 "weaving mill" (Erman and Grapow 1926-63, II: 96)

 "moat, channel, pond" (Erman and Grapow 1926-63, II: 97)

In the first two cases the word is spelled by the consonantal signs *m* and *r*, the meaning is easily recognised by the PYRAMID determinative in the first example, and by the EVIL.BIRD used for everything bad in the second. The third prevent polyphony[21] or otherwise determine a reading[22]. Because the arguments brought forward are considered as weak and misguided, I will abandon the use of at least semantic determinatives (leaving open the existence of semantic classifiers) and stick to Zender's (1999: 41-45, 99-100) observations.

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example uses the graphic representation of a channel as the two-radical sign *mr* (later reinterpreted as a weaver's reed [Spiegelberg 1908]) with the IRRIGATION and STROKE determinatives. The last example is another *mr* sign (with the complement *r*), but the same sign as in the third example is used here as the determinative BODY.OF.WATER. Zender (1999: 42) exemplified by the verb *ḫtj* as

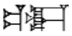
  "to cut, to engrave" (KNIFE) and "to retreat, to neglect, in a land" (FORWARD.MOTION) (Erman and Grapow 1926-63, III: 342, 347).

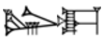
In the case of *mr*, all examples except "weaving mill" are already testified since the Old Kingdom and are therefore contemporaneous, *ḫtj* as "retreat" is known from the Middle Kingdom on, while "cut" only emerged in the 19th dynasty. A diachronic perspective is also helpful for Egyptian to disambiguate meanings. However, the case of distinguishing homophonous spellings is not transferable to the Maya script, as it does not exclude vowels from the script.

21 In contrast to Egyptian hieroglyphs, Sumerian cuneiform does not require semantic determinatives (or classifiers, rather) for homophones (as heterography is involved, see below), but for polyvalency. The sign <APIN> can take a couple of readings and meanings (after Foxvog 2010: 11):

 "plow" <apin>, "to plow" <uru$_4$>, "farmer" <engar>, "furrow" <absin$_3$> (Rosengarten 1967: 55).

To distinguish the readings, an optional sign can be added in front of the basic sign:

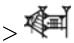
 "plow" (WOOD) $<{}^{\text{ĝeš}}\text{apin}>$

 "farmer" (PERSON) $<{}^{\text{lú}}\text{engar}>$

For <uru$_4$> and <absin$_3$>, no determinatives are known, the verbal use can however be made accessible by the syntax that usually places the verb to the end. It is also interesting to note that when spoken Sumerian became extinct, the determinatives became mandatory (e.g. in Akkadian cuneiform [Foxvog 2010: 11]). For Maya writing, Mora-Marín (2008: fig. 7a-b) gives the example of the sign AL8, the polyvalent 'up-ended frog' glyph as **SIH** and **hu**. In the first case, a band of circular elements around the snout shall indicate the value **SIH**, while its absence signifies **hu**. He admits that this determinative is sometimes absent with **SIH** (2008: 206), but fails to provide evidence how it shall be distinguished then from its syllabic counterpart other than context. Indeed, polyvalence seems to be the key to deny the necessity of semantic determinatives. There is never more than one syllabic value for one grapheme (Zender 1999: 56) and a determinative is not needed, as a syllabogram is cenemic. Otherwise, morphographic readings (and thus meanings) are distinguished by phonemic indicators rather. Another counterargument are the signs that have been termed as *relational units* by Zender (1999: 70-83), a combination of two or more signs with a distinctive reading each to form a sign of a new phonemic content and meaning. In the case of the signs of the male head 32P(2) as the head variant for **TI'**, "mouth", another glyph placed above the mouth shall act as a semantic determinative (Mora-Marín 2008: fig. 7c-f, 206) to distinguish the basic meaning **TI'** from the other ones (i.e. PM4 **UK'**, PM5 **WE'** and PM2 **NUN**). Consequently, other relational units, such as ZX2 **PAS** should also include some determinative. But as these units are unequivocally distinguishable from their source signs, no determinative would be needed. Zender (1999: 74-75) exemplified the formation of a relational unit by Uruk IV-III proto-cuneiform (the same in Early Dynastic IIIb cuneiform). Besides the merging of two distinct signs, the specification of a base sign was here additionally reached by the *gunû* or *šeššig* method (Foxvog 2010: 9) to heterographically enhance it by the addition of small strokes. Further specification was reached by a phonemic indicator, thus getting multiple meanings out of a polyphonic base sign, for example in the case of <SAĜ>:

 "head" <saĝ> + *gunû*

>  "mouth" <ka/kag$_2$> +  <ME> >  "tongue" <eme>

\+  <NUN> >  "lip" <nundum>

Note that the *gunû* and *šeššig* strokes are not determinatives or classifiers, as these are always placed before or seldom after a sign (Foxvog 2010: 13). The semantic classifier <$^{\text{uzu}}$> for body parts was apparently not in use for such cases, as it might have been redundant. In the case of the <KA> sign, Sumerian cuneiform was apparently quite close to the Maya case to use phonemic indicators rather than determinatives.

22 Here, the cart can be put before the horse. In the case of the relational units MOUTH.ACTIONS, the object in the mouth indicates the action: XE2 **HA'**, "water" becomes PM4 **UK'**, "drink" within the relational unit (Zender 1999: 74-75). Thus, the male head should rather be a semantic classifier for actions done with the mouth, as per Mora-Marín's (2008: 200) definition these sign groups all have a different reading, thus no determinative would

Much has already been told about certain *sign features* that are determined as another facet by the functional classification. Hereby, *allography* is the use of more than one sign for a phoneme (cf. Grube [1990a] for an overview of the development of the syllabary)[23]. *Homophony* describes the use of different or identical spellings for an identical phonemic value with different semantics (Boot 2010a: 263-266, Grube 1990a: 26-27, 70-75, Houston 1984, Lounsbury 1984)[24], and is often not distinguished from *heterophony*, a different (yet similar) pronunciation (also as a problem of vowel complexity reconstruction). In contrast, *polyphony*[25] or *polyvalence* (Boot 2010a: 266-269, Fox and Justeson 1984b,

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be needed. The same disqualifying problem arises with the sign group of OBJECT.EATING.ANIMALS (Gronemeyer 2013: fn. 4) that all name different species (AT4 **KOJ**, "puma [*Puma concolor*]", B00 **WAKOH**, "laughing falcon [*Herpetotheres cachinnans*]").

[23] Some older works (cf. Grube 1990a: 8) do not distinguish between allography and homophony and subsume both phenomena under the latter. One prime example for allographic sign substitution is **u** in the context of the directional count glyphs (Stuart 1990a: 219-221).

[24] Homophony can graphemically thus be realised as homography (same spelling, thus always a *homonym*) or heterography (different spelling). Often in the epigraphic literature, it has just been reduced to the latter. The paradigmatic case study (Houston 1984) shows how homophonous lexemes have different graphemes and how the scribe was able to 'playfully' interchange them in a rebus (Robertson 2004b: 23). 004, SN4 (as the numeric head variant, otherwise polyphonic **K'IN**), AC6 "snake" and XH3 "sky" all have the phonemic value **CHAN** (Zender 1999: 50-51) and there are instances where they freely substitute, as in the name of *Tiwol Chan Mat* of Palenque (Houston 1984: fig. 2, Schele and Mathews 1979: nos. 406, 456). Such cases are also known from other writing systems (e.g. Sumerian [Foxvog 2010: 11]), but are rare in Maya writing. Most heterographs never interchange, as with XG8 "black" and XQ6 "wind" as **IK'** (Boot 2010a: fn. 15). Homonyms in contrast are more frequent as free morphemes, and these seem to be always polysemic (e.g. bah as "first < head > self" [Boot 2010a: 269-277], see also below on polyphony). While it is true that 1G2 **NAH** is used both in the meanings "first" and "house", they may be heteronyms as *nah* "first" and *naah* "house". More interesting with respect to morphographs are those homonyms used for bound *CVC* morphemes. Others than **TAK** and **NAL** are used and are exclusively numeral classifiers (Macri 2000, Thompson 1972b), carrying a semantic meaning as a compositional bound morpheme. Examples are **TE'** < *–te'* (e.g. TRT Mon. 6, F11b) for numerical and calendrical counts (Prager 2003), otherwise "tree, staff, stick" or **TAL** < *–tal* (e.g. YAX Lnt. 11, A1) for ordinal counts, otherwise "to come". Some of them also seem to be polysemes, e.g. **PET** < *–pet* (e.g. AGT St. 1, D8b) for sections or lots of land, *milpa*, otherwise "round thing, island, province, region". Other classifiers are constantly realised by syllabic signs, as no morphograph of the same phonemic value is known (e.g. **la-ta** < *–lat*, TAM HS. 2, Step III, A1) or they are disyllabic (e.g. *–tikil* as **ti-ki-li**, CRN P. 1, J1 [Houston 2009: 159]). The same applies for other non-*VC* suffixes, as the positional *–wan* and *–laj* or the optative *–na'ik*. This also clearly shows that morphographs were phonographically used when applicable and the sign itself is without any proper meaning. It was only added by the phonemic content and by its morphemic embedding and semantic context. If no morphograph was in the sign inventory, syllabic spellings were taken. We can here take up the question of semantic determinatives again to disambiguate homophones (Mora-Marín 2008: 201-207). As with the Egyptian example of *ḫtj* above, we cannot claim that the two meanings were really homophonous with respect to the omittance of vowels in the script. Secondly, the Egyptian spellings are also not entirely homographic, as the determinative distinguishes them (and as the determinative is mandatory, these spellings are comparable to the indispensable radical in Chinese and *kanji*). Closer to the Maya case seems to be the Sumerian writing system, where homophonous words were represented by distinct cuneiforms (Foxvog 2010: 4), as with <du>:

 "come, go" <du> (Rosengarten 1967: 68)

 "build, make, do, perform, plant, erect" <du$_3$> (Rosengarten 1967: 30)

 "push, thrust, gore" <du$_7$> (Rosengarten 1967: 12)

We could suggest for Maya writing (by an impression, but pending an empiric survey) that homophones are usually distinguished on a graphemic level by heterographs, while homonyms apparently do not require a semantic disambiguation because they have the same etymology and share similar semantic environments.

[25] Polyphony necessarily requires homography. It adds another aspect of functional sign properties that cannot be pursued here in full detail. As a showcase, I take the GOPHER.HEAD sign AP9 which is known to spell the Late Classic syllabogram **ba** (Grube 1990a: 72-73) as an acrophonic reduction from the word *bah* (Houston, Robertson and Stuart 2000: 328, Mora-Marín 2008: 200-201) to name the pocket gopher (*Orthogeomys sp.* [Rätsch and Probst 1985: 237-238]). Homophonous to this meaning are as well "first" and "image, face, counte-

Jones 1996, Zender 1999: 54-69) defines different phonemic notions for one sign which also may lead to converging sign classes. *Polysemy* refers to different, yet related meanings, as they evolved from the same etymology (Boot 2010a: 269-277).

The notion of vowel quantity is a principle first described by Houston, Stuart and Robertson (1998). It is a graphematic criterion, as graphotactic rules – the combination of certain disharmonic signs – are the reflection of spoken language and script contrariwise does not determine language. The principle of *vowel harmony* (**CV_1-CV_1** < *CV(h)C*) was first introduced by Knorozov (1952, 1965: 174-175) and was for a long time accepted for syllabic spellings and phonemic complementation. Justeson (1989) further defined **C_1V_1-C_1V_1** < *$C_1V(h)C_1$* and **CV_1-ʔV_1** < *CV'*. Although exceptions from the 'rule' where recognised (Knorozov 1965: 183), they were initially not yet interpreted[26]. When the final vowel is not congruent with the root vowel, we accordingly speak of *vowel disharmony* (**CV_1-CV_2** < *CV({', h, :})C*). This is today mostly considered as the principle to indicate the root vowel quantity[27].

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nance" (Houston and Stuart 1998: 73-77, Proskouriakoff 1968: 247, Schele 1990a). In the *bah kab*, "countenance of the earth" title (Gronemeyer 2012: 32-33, Houston, Taube and Stuart 2006: 7, 61, 62-63) for example, the word *bah* is represented by AP9 alone (e.g. NAR St. 24, E18). Substitutions with XE1 **ba** in this position or AP9 in the spelling **ka-ba** at the same time (e.g. MQL St. 7, E2b) suggest that this grapheme is polyphonic **ba** and **BAH**. Historically, it simply may have been **BAH** only, and no contention arises about its nature: it spells a lexeme and is morphographic. Especially Early and some Late Classic spellings show just **u=BAH** < *u-bah*, "his image" (e.g. TIK St. 31, I1, YAX Lnt. 25, F4). At least for the Late Classic, another view would be to just consider the sign as the syllabogram **ba** with the final weak consonant (Zender 1999: 38-41, 131-132, 135-142) underspelled and to be mentally added by the recipient as *ba[h]*. The frequent affixation with **hi** especially in *u-bah* expressions (e.g. DPL P. 19, J1) does not help to answer the question of the functional class in this context: It could either work as another syllabogram in a full syllabic spelling **ba-hi** or as a phonemic complement in **BAH^{hi}**. In Dos Pilas, XE1 **ba**, one of the allographs to AP9, underspells both *bah* (e.g. DPL HS. 2 East, Step II, F2) and *baj* "hammer" (Prager et al. 2010: 75, Zender 2010) in the nominal phrase of *Bajlaj Chan K'awil* (e.g. DPL HS. 2 East, Step II, E1). If a syllabic sign in an underspelled context like **ba ka-ba** is assumed, then even a syllabogram is able to convey semantic meaning and act as a word sign. This is also true for some prepositions and particles (**ti** < *ti*, "in, for, by, with"). When it is said above that a syllabogram can have morphemic properties, this is reflecting the current understanding (or definition) that such a signs indicates or denotes a bound morpheme rather than a free morpheme. But where exactly are then the borders between syllabograms as phonographs or morphographs? One might still think what the Late Classic scribe had in mind – or if the distinction outlined here is the theoretical reflection from a scholarly point of view. Eventually, we might be able to work out an autochthonous language and writing description, if sign applications and orthography are carefully investigated. In the end, one might wonder if the syllabogram/morphograph separation must be considered more fluid as the understanding of functional sign classes and the orthography develops. One model might be the Egyptological way to count the radicals of a sign (Gardiner 1957: §§ 17-18, 32, 42), thus Maya epigraphy could simply speak of 2-, 3- or 5-value phonographs that can take a morphographic function (hence morpho-phonemic might be an even apter description than morpho-syllabic). I will not abandon the morpho-syllabic classification though, as it is the closest approximation to describe the Maya writing system, as exemplified by the Japanese system. To restate the critique by Weingarten (2011: 13), such a proto-typical typology may not adequately account all linguistic parameters. With the above examples, I would like to vote for a more versatile view on grapheme use in Maya writing. The thesis topic might shed more light on this question, but in the end, the Maya writing system would need a thorough comparison with other logo-syllabic/morpho-syllabic scripts and peculiar features such as the indication and distinction of vowel length.

[26] As synharmony is today basically considered equal to a short root vowel, it has already been pointed out (Houston, Stuart and Robertson 1998: 287) that these spellings are unmarked and may also reflect a complex vowel (e.g. **k'a-k'a** < *k'a[h]k'*). However, in 67 % of all cases, synharmonic spellings reflect a regular vowel.

[27] Interestingly, disharmony previously had been considered as an explanation for "the initial vowel of the suffix" (Justeson 1989: 35), an idea also initially pursued by Houston and Stuart (Houston, Stuart and Robertson 1998: 276) for certain spellings. This has also been picked up (Lacadena and Wichmann 2004: 116-119) for some unusual spelling patterns. In agreement with Houston, Stuart and Robertson (1998: 276) who were also likely already thinking of morphosyllables (Houston, Robertson and Stuart 2001b) at that time, this explanation is

Two models have evolved in the meantime. The original description of the disharmonic principle (Houston, Stuart and Robertson 1998) retains a deeper analysis of the data patterns and bases on comparison with the proto-Ch'olan (Kaufman and Norman 1984) lexicon (which denies at least long vowels) and further methods of historical linguistics[28] to determine the complex vowel. In summary, some percentages from the data gathered are given to indicate how often disharmony is indeed expected to indicate complex vowels[29] of any kind.

Lacadena and Wichmann (2004) further developed the disharmonic principle and suspect a systematic connection between the silent, disharmonic vowel and the root vowel, implying an unambiguous quantity of the latter. They accept the same unmarkedness for synharmonic spellings (Lacadena and Wichmann 2004: 104-108), as their first harmony rule. In addition to the original proposal, two supplementary rules shall indicate the specific complex vowel by a certain disharmonic pattern, e.g. **C{a, i}(C)-Cu** < *CV'(V)C* . In this sense, syllabograms would even more contribute to distinguish minimal pairs (see Chapter 1.1.2).

The harmony rule approach has been broadened in a subsequent paper to also apply it to grammatical morphemes[30] (Lacadena and Wichmann 2005b). These defined relationships have been

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abandoned for a couple of reasons. The main argument with respect to the indication of complex vowels is that disharmony necessarily has to ignore morpheme boundaries in order to work (Houston, Stuart and Robertson 1998: 277). A typical indicative transitive spelling **u=chu-ku=wa** < *u-chuk-u(w)* is synharmonic for the root *chuk*, "to capture", but disharmonic for the suffix. The opposite is the common corresponding passive spelling **chu-ka=aj** < *chu<h>k-aj* where the root is spelled disharmonic (with the <h> being a linguistically reconstructed derivational morpheme [Bricker 1986: 128-129, 138, Lacadena 2004b, MacLeod 1990: 280-289] and not a complex vowel), but the suffix is synharmonic. See also below on disharmony in the suffix domain.

[28] However, some of the examples remain methodologically unexplained: **CVCVC** roots (e.g. **mi-ya-tzi** which is given as *miyaatz*, where the complex vowel is given for the last two disharmonic spellings only) and suffixed forms (e.g. **u-to=ma** as *u[h]t-oom*, although the suffix is considered as "puzzling" by the authors). Houston, Stuart and Robertson (1998) give most of their disharmonic and disyllabic examples with the complex vowel reconstructed in the second syllable. Any potential vowel complexity given for the final syllable likely correlates with phonological syllabification (as a reflection of spoken language, see below), but has not yet tested against these premises, a desideratum this thesis is also not able to accomplish.

[29] In the cases of a primary root vowel (/a, i, u/), the mean percentage of an anticipated spelling (i.e. synharmonic for short and disharmonic for complex vowels) is 76.7% (calculated after the figures in Houston, Stuart and Robertson [1998: 287-288]). But this is just a relative frequency, and the figures have not been undergone a statistical significance test (see Chapter 2.5.2). The percentage still seems to be too small for a rule implied, but being a strong argument that disharmony had an indicating purpose of any kind (see the review in Chapter 4.2.3). In that sense, disharmonic spellings were also considered as a form of heterography (Robertson 2004b: 31-32) for phonemic distinction.

[30] Lacadena and Wichmann (2005b: 1) speak of *word*-final syllables, thus extending the principle to suffixes as well (2005b: 2). A question thus far never raised for the consideration of disharmonic spellings at morpheme boundaries and within the suffix domain is the phonologic syllabification (Ulrich Wölfel, written communication, February 28, 2009) within an inflected polysyllabic word, also including lexicalised disyllabic words. In a typical [CVCVC] lexeme, e.g. *winik*, "man, person", it could either be [wi.nik] or [win.ik]. Hence Mayan syllables require an onset, but not necessarily a coda (Brown and Wichmann 2004: fn. 2, also cf. Schumann Gálvez 1973: 35, Schumann Gálvez 1997: 51, 60-61), the second possibility must be rejected, otherwise it needs to be **[win.ʔik]. The same rule (Mora-Marín 2004a: 1) would also apply for any √*-VC* spelling (e.g. *ch'ah-om*, "scatterer" as [t͡ʃ'a.hom] or *tzu<Ø>tz-j-om*, "it will be closed" as [t͡sut͡s.xom], see Chapter 4.1.1 for the <Ø> passive alloform). We can see that in the case of grammatical suffixes, the syllabification does not necessarily coincide with the morphosyntax (as e.g. attested for CHL [Attinasi 1973: 46]). This may also be true for *winik* and *ixik* as lexicalised forms of a theoretical **-ik* 'person' suffix (Attinasi 1973: 112, also Knowles 1984: 171), as *ix-* is also known from the epigraphic record (cf. Wagner 2003). That may be an explanation why sometimes grammatical morphemes are overspelled, as in the examples from above (**IL=NAH** < *il-n-a[j]* as [ʔil.nah] or **K'UH=HUL** <

responded with a harsh critique (Robertson et al. 2007) and 'counter-rules', while the entire disharmonic approach as well has received deviating reviews in favour an *affixation conventionalisation hypothesis* (Mora-Marín 2003a, 2004a, 2010a), also disregarding morphosyllables. As the question of the harmony rules is also of importance for the present thesis, I will refer to the issues later more from a linguistic point of view in the methodology and the analysis of the epigraphic data. Apart from the question whether harmony rules are the graphotactic emanation of an underlying linguistic phenomenon, synharmony and disharmony can be used as technical terms to describe a certain spelling pattern.

1.2.1.3 – Decipherment Premises

Some criteria for a consistent treatment need to be provided for the determination of the content of a hieroglyph, i.e. the linguistic extraction of the signified. Following Riese (1987: 13), a *decipherment* will only be considered secure when (1) all signs are fully legible, (2) the glyph represents a lexicalised, meaningful and translatable word of a Mayan language, and (3), the glyph fulfils a semantic role on the syntagma.

For those cases, where only the first and possibly the third criteria are fulfilled, I will speak of a *reading*, also when I refer to the phonemic content of a deciphered glyph. When only the third condition is realised, an *interpretation* can be given. If any of the three criteria are merely matched, I will consider it as a *proposal* (e.g. reading proposal).

I will not cite the source(s) for every reading or interpretation of the glyphs and expressions discussed in the thesis or recap their correctness, as this would exceed the limitations. Only in case of necessity, I will discuss alternatives.

1.2.2 – Linguistics

1.2.2.1 – Phonetic and Phonologic Premises

Some phonetic and phonologic features of Classic Mayan have already been mentioned in the previous chapter. I would like to elaborate the *articulatory phonetics* and *phonology* a bit further, but restrict both to a tabular overview. The reconstruction of the phonetics of an extinct language is hardly manageable and might be negligible for the present study. Thus, features like palatalised consonants are neglected and allophones omitted, and I restrict myself to present a general phonetic inventory together with the phonemes used in transliterating and transcribing Maya hieroglyphs (Tables 1 and 2). This also leads to spelling suggestions that are based on phonological premises rather than

k'uh-ul as [k'u.hul]). The general pattern of (root) [CV({h, ʔ})(C).CVC] syllabification (see also Chapter 1.2.2.1) is for example described for the following languages: pWa (Norcliffe 2003: 16-17), pTz (Kaufman 1972: 29), CHN (Smailus 1975: 186), CHL (Attinasi 1973: 46-51, Schumann Gálvez 1973: 12-16, Vázquez Alvarez 2002: 4-5), CHR (Fought 1967: 85), MOP (Schumann Gálvez 1997: 59-60), ITZ (Schumann Gálvez 1971: 31-33) and LAK (Bruce 1968: 28-33), so it is reasonable to suppose it also for ClM.

morphosyntax (Table 3). The question of the phoneme inventory is also biased by the question of the genetic affiliation of Classic Mayan (see Chapter 1.2.2.3).

The phonology of Classic Mayan, its relatives and antecedents, is a vast topic, also interfering with the question of the genetic affiliation of the language. I refer to the a selection of the common literature on the topic (Bricker 1986: 17-19, Campbell 1984: fig. 1, tabs. 1, 9-15, Grube 2004d, Houston, Robertson and Stuart 2000: 327-334, Houston, Stuart and Robertson 1998, Justeson 1985, Justeson et al. 1985: 57-62, Kaufman 1972, Kaufman and Norman 1984: 83-89, Lacadena 2001, Lacadena and Wichmann 2004, 2005a, Mora-Marín 2010a, Wichmann 2002a, 2006a: 284-286) and return to it further below.

	Bilabial		**Alveolar**		**Alveopalatal**		**Palatal**		**Velar**		**Glottal**
	plain	implosive	plain	ejective	plain	ejective	plain	ejective	plain	ejective	plain
Stops	[p] /p/	[b’] /b/	[t] /t/	[t’] /t’/					[k] /k/	[k’] /k’/	[ʔ] /’/
Affricates			[t͡s] /tz/	[t͡s’] /tz’/	[t͡ʃ] /ch/	[t͡ʃ’] /ch’/					
Fricatives			[s] /s/		[ʃ] /x/				[x] /j/		[h] /h/
Nasals	[m] /m/		[n] /n/								
Liquids			[l] /l/								
Glides	[w] /w/						[j] /y/				

Table 1: Classic Mayan consonants. Compiled after several sources (Campbell 1984: tab. 2, Dürr and Schlobinski 1994: fig. 1.2, Kettunen and Helmke 2010: tab. XV).

The question of Classic Mayan *syllabification* has already been tangled above (footnote 30) with respect to the hypotheses of disharmonic spellings. Based on that and by comparative linguistics, a tabulation of canonical stem forms can be given (Table 3).

	Front	**Central**	**Back**
High	[i], [iː]? /i/, /ii/?		[u], [uː]? /u/, /uu/?
Mid	[e], [eː]? /e/, /ee/?	[ə]? /a/?	[o], [oː]? /o/, /oo/?
Low		[a], [aː]? /a/, /aa/?	

Table 2: Classic Mayan vowels. Compiled after several sources (Campbell 1984: tab. 3, Dürr and Schlobinski 1994: fig. 1.3, Kettunen and Helmke 2010: tab. XVI).

By the types of spellings for the 3SG.ERG / #__V (Table 3, ex. 3a), we can assume that the initial glottal (V > [ʔV] / #__) disappears upon affixation, as noted for other Mayan languages (Kaufman 2003: 27-28, Schumann Gálvez 1971: 35, 1997: 61-62). Because it is inherent in ‘vowel-initial’ lexemes, it is usually not written in transliteration and transcription[31]. The case of weak consonant underspellings in [C.C] environments (Table 3, exx. 4, 5, 6) has also been detailed by Zender (1999: 135-142)[32]. By the types of canonical stem forms (Table 3), we can formulate four basic spelling rules[33] that, as a rough guess, apply for almost all (uninflected/lexicalised) root spellings[34]:

(1) Monosyllabic [CV]: simple **CV** spellings and restricted to particles and prepositions (Wald 2007: 48-49), sometimes with contracted and fused other morphemes.

(2) Monosyllabic [CV(h)C]: synharmonic $\mathbf{CV_1\text{-}CV_1}$ or disharmonic $\mathbf{CV_1\text{-}CV_2}$.

(3) Bisyllabic [CV.CVC]: first syllable always $\mathbf{CV_1}$, second syllable synharmonic $\mathbf{CV_{1/2}\text{-}CV_{1/2}}$ or disharmonic $\mathbf{CV_2\text{-}CV_3}$, while any glottals normally remain underspelled (with exceptions e.g. on K1728, I'1-I'2 as **chi-ji-la-ma** < *chihlam* and K7786, F1 as **che-e-bu** < *che'eb*).

(4) Bisyllabic [CVC.CVC]: as per rule 3, while the coda of the first syllable normally remains underspelled.

(5) Trisyllabic [CV.CV.CVC]: as per rule 3, while any internal glottal onset normally remains underspelled (with exceptions e.g. on CRN HS. 2 XIV, C2 as **ko-o-ha-wa** < *ko'ohaw* and CPN Alt. W, D2 as **ko-xo-o-pa** < *koxo'op*).

(6) Trisyllabic [CV.CVC.CVC]: as per rule 3, while the coda of the second syllable normally remains underspelled (an exception e.g. on K2796, Q8 as **ja-wa-na-TE'** < *jawante'*).

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[31] As on a phonological level, there are also instances on a graphematic level, where a **ʔV** syllabogram has to elide the inherent onset glottal in order to represent the initial vowel of a suffix, e.g. in **IL-li=a-ja** < *il-aj* [ʔi.lax], "he saw it" (NTN Dwg. 66, B1, NTN Dwg. 70, B1), otherwise ***il-'aj* and **[ʔil.ʔax]. A special case is e.g. **ya=a-la=ni** < *y-al-an* [ja.lan], "his said (words)" (K8885, B2b [Grube and Gaida 2006: fig. 37.1]). The additional **a** sign is an overspelling and does not indicate ***y-a'(a)l-an*, as we have pCh **äl* (Kaufman and Norman 1984: 116).

[32] Interestingly, the environments for underspellings of weak consonants in Egyptian hieroglyphic writing are also determined by syllabification (Kahl 1992).

[33] If at all an indicator, disharmony may only affect the last syllable of a word (as a morphological unit), because it is most often a closed syllable of a [CVC] structure, while the preceding one(s) can be. The only exceptions for the last syllable as [(C)V] are inflected forms: (1) the imperative $-V_1$ suffix (Beliaev and Davletshin 2006: 25), (2) the causative *–bu* (cf. Lacadena 2000a: fn. 11) and (3) possibly the *–i* completive status marker for intransitive verbs (Houston, Robertson and Stuart 2000: 329, Mora-Marín 2003a: 5). For all other phonological syllables before the last one, reconstruction of complex vowels is needed from historical linguistics. Often, this complex vowel will turn the [CV] syllable into [CV(h)] anyway (Table ex. 3a **yi=tz'i-na** < *y-i[h]tz'in* [jih.t͡s'in]). The syllabification with focus on the last syllable thus also explains underspellings in [C.C] environments (Zender 1999: 135-142), Table 3 ex. 6 **u=ja-wa-TE'** < *u-jawa[n]te'* [ʔu.xa.wan.teʔ]. And because the final closed syllable in a word often contains a grammatical morpheme, this assumption might be taken as an argument for the practicability of disharmonic spellings for the suffix domain. Despite some preliminary caveats in Chapter 3.2, this will be a subject of review during the analyses in Chapter 3.3 and discussion in Chapter 4.1. Another aspect never raised in connection with disharmonic spellings (see Chapter 3.2.2, section 3d) is stress put on the last syllable in a word in most Mayan languages (cf. Fox 1978: 37-46, Schumann Gálvez 1971: 35, 1997: 54-55).

[34] There may be some rare forms not considered in the scheme of canonical forms, which is meant as a general sketch of morpheme syllabification. This includes compounds as well, e.g. *jawante'*. Also, the exceptions of underspellings are not very frequent, and the coda within bi- or trisyllabic words is rarely realised by an overspelling (e.g. **chi-ji-la-ma** > *chihlam*, "interpreter" [Wichmann 2004b: 79] on K1728), evoking the principle of spelling economics (Gelb 1952: 72), although I would broaden it to be intrinsic to a writing system.

(1) CV	*ti*	> **ti**	in, at, by, for, …	AGT St. 1, B12
(2) CVC	*ch'ok*	> **ch'o-ko**	youth	YAX St. 7, pD5
a) ʔVC	*ul*	> **u-lu**	atole	K2730, F1
b) CVʔ	*tz'i'*	> **tz'i-i**	dog	TNA Mon. 89, A1
c) CVhC	*bu[h]k*	> **bu-ku**	clothing	NAR K1398, L1
(3) CV.CVC	*pakal*	> **u=pa-ka-la**	shield	DPL HS. 4 V, F2
a) ʔV.CVC	*-otot*	> **o-to-ti**	house	CHN ADz, G2
b) ʔVh.CVC	*-i[h]tz'in*	> **yi=tz'i-na**	younger brother	CRC St. 6, C22
c) CVh.CVC	*ba[h]lam*	> **ba-la-ma**	jaguar	CAY St. 1, Dp9
d) CV.ʔVC	*bu['u]l*	> **ka=bu-la**	bean	K2914, Z
(4) CVC.CVC	*xo[l]te'*	> **xo-TE'**	staff	K2774, F1
(5) CV.CV.CVC	*-ate[j]aj*	> **ya=TE'-AJ**	companion-one	TZB Mon. 14, Bp3
a) CV.ʔV.CVC	*ko['o]haw*	> **u=ko-ha-wa**	helmet	PNG COL2, A3
b) CV.CV.ʔVC	*koxo['o]p*	> **ko-xo-pa**	a CPN toponym	CPN Str. 9N-82, J1a
(6) CV.CVC.CVC	*jawa[n]te'*	> **ja-wa-TE'**	plate	K4669, B3

Table 3: Canonical forms of Classic Mayan (lexicalised) stems with subtypes and examples. Compiled after Lacadena (2001), Kaufman and Norman (1984), Houston, Stuart and Robertson (1998), Lacadena and Wichmann (2004) and Boot (2009b).

These examples also show why the Maya writing system cannot be considered as moraic, in contrast to Japanese (Ratcliffe 2001: 5-6). Maya writing has no heavy open syllabograms. The script mostly underspells open heavy syllables and uses one **CVC** or two **CV** signs for closed syllables (unless word-internal)[35], possibly with disharmony as a suprasegmental graphematic rule to indicate vowel complexity instead of vowel gemination (also see Chapter 3.2.2).

The spelling rules for inflected stems following a *√-VC* pattern will be the central part of investigation in the thesis. Details on the patterns and the mode of their linguistic and graphematic analysis are the topic of Chapter 2.1.

Mayan languages underwent a number of *sound changes* through time and while branching into the different families. Two apparent cases are pCh *[i] < pM *[eː] and pCh * [ʧ/ʧ'] < pM *[k/k'], so we have pCh **chij* and ClM *chih* contrasted with pM **kehj*, YUK *kéeh*, "deer" (Campbell 1984: tab. 2,

[35] I therefore conclude the following ClM syllable types: open light [ʔV] and [CV] = one mora, open heavy [ʔVh] and [CVh] = two morae, closed light [CVC] = two mora and closed heavy [CVhC] = three morae. The distinction into open heavy syllables is possible because ClM maintained the distinction between [h] and [x]. The canonical forms in Table 3 also omit any forms with [Vʔ], such as a theoretical closed heavy [CVʔC], these appear to be non-existent in ClM. Such forms base on pM and are also used by Lacadena and Wichmann (2004: tab. 6.3), e.g. **ba-tz'u** < *ba'tz'*, while pCh **b'atz'* < pM **b'aʔtz'* (Kaufman and Norman 1984: 116). The forms reconstructed for pCh only feature [VʔV] as a pM reflex, so we can also infer that pM [Vʔ] > pCh [V] (see footnote 502), as it was already reconstructed by Kaufman and Norman (1984: tab. 6). While [VʔV] can be a lexical nucleus, it syllabifies a lexeme into a bisyllabic form, e.g. *bu'ul* [bu.ʔul]. Therefore, a glottal stop can never be part of a syllable nucleus, but very well the glottal fricative [h]. While we can syllabify a word like *bu'ul*, lexemes like the glyphically attested *uht* [ʔuht] or *buhk* [buhk] cannot be syllabified without resulting in an impossible CC syllable, e.g. **[bu.hk]. Any CVC lexeme with a complex vowel is either mono- or bisyllabic. Also see Chapter 3.2.1, section 1. I also consider a spelling like **ko-o-ha-wa** not to result in ***ko'haw* (e.g. Boot 2009b: 96). The rule that **CV-V** < *CV'* (Table 3 ex. 3b) is only applicable in word-final spellings. In a medial position, the **ʔV** sign is no overspelling to provide the glottal stop with a muted vowel, as this would contradict the non-existence of [Vʔ] in pCh and likely also ClM (although a syllabification **[koʔ.haw] would not necessarily violate the canonical forms). Finally, transcriptions like ***to[o]'[h]k* (for pCh **tok'*), ***tu[u]'[h]p* (for ClM *tup*), ***ne'[h]n* (for pCh **nehn*) done by Lacadena and Wichmann (2004: 136-162, tabs. 6.2-6.3) as ClM reconstructions seem to be overly carried out, combining both historical linguistics and their harmony rules (Lacadena and Wichmann 2004: 123-126). The result are 'hyper-heavy' closed syllables (matching up to three morae for just the nucleus!) that find no equivalent in any existing language.

11, 14, Fox 1978: 77-90, fig. 13, tab. 21, Houston, Robertson and Stuart 2000: 327-328, Kaufman and Norman 1984: 118). I will not further discuss the general phonemic processes here, but refer to some specific cases for the genetic language affiliation in Chapter 1.2.2.3 and throughout the methodology and the hypothesis examples to be analysed. The analysis of the phonological processes has also implications for Mayan glottochronological dates (Campbell 1984: fig. 1, tab. 1). Sound changes are also apparent when foreign loanwords are mayanised (Macri and Looper 2003a, Pallán and Meléndez 2010, Whittaker 1986), but these cases are generally negligible for the scope of the present study[36].

Another aspect of Classic Mayan phonology tackles *morphophonemics* as the description of allomorphic sound changes and upon morphological alterations (Trubetskoy 1929). While morphophonological processes have generally been described for all modern Mayan languages, Classic Mayan has received rather little attention. Reconstructions exist, but have not systematically tested against epigraphic evidence.

A well known case are two sets of ergative pronouns (Law 2006: 32-35, 2009: tab. 1, 224-230, Robertson 1977a, 1983a), as with 3SG.ERG *u*– / #__C and *y*– / #__V, but changes are also evident with the 1SG.ABS at the independent pronoun (Hull, Carrasco and Wald 2009). The infix of /h/ into the nucleus of a transitive verbal root to derive a passive form has been described by several authors (Bricker 1986: 128-129, 138, Lacadena 2004b, MacLeod 1990: 280-289). Vowel syncopation at morpheme boundaries[37] has only recently moved into the focus (Gronemeyer 2011b: 321, Mora-Marín

[36] Mayanised spellings of foreign words are nevertheless worth a crosscheck for the predictability of syllabification, e.g. for the Nahuatl names of the Venus Gods in the Dresden Codex (Macri and Looper 2003a: 287-288, Taube and Bade 1991, Whittaker 1986). The name of *Tlāhuizcalpantēcuhtli* [tɬaː.wis.kal.pan.teːkʷ.tɬi] is spelled as **ta-wi-si-ka-la** < *ta[a]wiskal* [taː.wis.kal] (C Dr. 48b2, A2). The Nahuatl [tɬ] sound is reduced to simply [t] with [t'] being more appropriate (Davletshin 2010: 31), although a **t'a** sign is likely existent in the syllabary (where Stuart suggested that on IKL Lnt. 1, A1 we find a syllabic substitution **t'a-ba=yi** > *t'ab-ay-i-Ø* [Bíró 2003: 2, Lacadena and Wichmann 2005a: fn. 1], also see Chapter 4.1.1 and Figure 51a for a productive substitution). The second case **CHAK xi-wi-te-k'i?** < *chak xiwtek'i* [t͡ʃak ʃiw.teː.k'i] (C Dr. 49b2, A2) comes from *Xīuhtēcuhtli* [ʃiːw.teːkʷ.tɬi], where **k'i** is likely used to render an equivalent to the [kʷ.tɬi] cluster (Albert Davletshin, written communication, April 23, 2012) of sounds not existing in Mayan languages. Whittaker (1986: 58) first saw a **lu** here, while **k'i** was proposed by Davletshin (written communication, May 31, 2011). The third god name *Kaktōnal* [kak.tuː.nal] is overspelled as **ka-ka-tu-na-la** < *kaktunal* [kak.tu.nal] (C Dr. 50b2, A2), either reflecting the Nahuatl [u] value for /ō/ (Karttunen 1983: xx) or a sound shift [u] < [o] (Davletshin, written communication, May 31, 2011). Another interesting case is **ko-sa-ka** < *koska* [kos.ka] < *cōzcatl* [kus.katɬ] (Pallán and Meléndez 2010: 18, 21) on TIK St. 31, L2, where we can explain the use of **sa** instead of **si** by historical linguistics (Davletshin 2010: 28), but may wonder about the use of **ko** instead of **ku**, which may indicate that no [o] / [u] distinction was yet made (Gordon Whittaker, personal communication, April 15, 2012). The case of *ko'ohaw* (Davletshin 2010: 32, Macri and Looper 2003a: 290-291, Pallán and Meléndez 2010: 21-22) has already been mentioned above. As it is apparent, the syllabic patterns differ from the genuine Mayan ones, but do not violate them.

[37] As Mora-Marín (2003a: 27, 29) suggested, spelling-neutral, synharmonic syllabograms are used to indicate syncopated forms as the shift from **o-ki=bi** < *ok-ib* as 'foot-INSTR' to **yo=ko=bi=li** < *y-ok-b-il* as '3SG.ERG-foot-INSTR-POSS' (PAL T19B-W, A3) might demonstrate. Further support comes from **e-ke=li=bi** < *ek-l-ib*, 'place-INTRS-INSTR' (CRN P. 2, O8 [Wichmann 2002a: 8-10]), ^{2}**tzu=jo=ma** < *tzu<Ø>tz-j-om* 'complete<PASS>-THEM-FUT' (TRT Mon. 6, O2) and possibly **u=ti-mi=je=la** < *u-tim-(i)j-e(')l* '3SG.ERG-appease-ANTIP-NMLS' (?), semantically first interpreted by MacLeod (Lacadena 2009: fn. 9, MacLeod 1999, Tokovinine 2006: fn. 11). Additional evidence are genuine [C.C] boundaries spelled synharmonically, such as **i e-ke=wa-ni=ya** < *i['] ek-wan*, 'FOC place-POS' (TRT Mon. 9, D6). In contrast to underspellings at [C.C] boundaries within roots of lexicalised compounds, synharmonic overspellings may be a regularity to orthographically signal syncopations. This is also in accordance with Knorozov's original postulate later restated by Lounsbury (1973: 100) that synharmony is the result of morphophonemic processes. There are also mixed spellings like **TZUTZ=jo=ma** (e.g. CPN St. A, B12,

2003a: 27, 29). There are many other interesting cases that also have not been pursued so far, e.g. the possibility of ablaut variations upon derivation (DuBois 1985) that may be traceable by shifting harmony patterns.

A central question of morphophonemics are allomorphs with a variable vowel, as the *–Vb* instrumental suffix (MacLeod 1990: 314-316, 337-338, Wichmann 2002a: 6, tab. 1) or the *–V₁w* modal marker for the indicative of transitive verbs (Bricker 1986: 126-128). While the latter's vowel reflects the root vowel, the first case seems to be irregular. The two cases will be part of the hypotheses this thesis is examining, so I will just refer to Chapters 2.1 and 3. 1.

1.2.2.2 – Morphosyntactic Premises

For a long time, it was assumed that Maya writing is not reflecting spoken language, and *parts of speech* and *syntax* are absent (Thompson 1950: 50-51). With Knorozov's works (1952, 1955, 1965), the contrary was attested, and the attribution of certain hieroglyphs to *lexical classes* was firstly achieved by structural methods of functional categorisation (cf. Berlin 1958, Gaida 1983: 8-12, Kelley 1976: 249-288, Proskouriakoff 1960, Zimmermann 1956: 18-27). Only later, morphological analyses (e.g. Bricker 1986, Schele 1982) were applied. Several parts of speech (Baker 2003, Dürr and Schlobinski 1994: 117-118, Lehmann 2008) can be recognised in Classic Mayan[38]: *pronouns*, *verbs*, *nouns*, *adjectives*, *numerals*, *prepositions*, *particles* and *adverbs*. All Mayan languages conduct word-formation by an *agglutinative type*, which was first described and labelled as such by von Humboldt (1836: § 14)[39]. These languages (Dürr and Schlobinski 1994: 84-85) attach *bound morphemes* with a distinctive meaning each to a *lexical root* to express categories like person, grammatical number, voice, tense, etc. Several of these bound morphemes can/must be attached to the lexeme to express grammatical categories.

Analogue to the syntax at a sentence level, the rules for the formation of a morpheme chain are subsumed under *morphosyntax* and basically oblige to the same requirements, e.g. by valency. In fact,

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YAX Lnt. 31, K5 [Grube 1990a: 17]) which may actually signify syncopation as well. This is not necessary always the case with disharmonic complementation, as for example with **BAJ**^{ji}**=la-ja** < *baj-laj* (CHL Frg. 1, Ap1). See also Chapter 2.2.2 for more details.

[38] The characteristics of the different parts of speech were already described in the literature, so I will just give a brief overview with the most important features. Some selected references will accompany the overview.

[39] Von Humboldt (p. 119) first characterises the three types of word formation: "[…] muß ich eine Eigenschaft der Sprachen erwähnen, welche sich zugleich über diese Beziehungen und über einen Theil der Wortbildung selbst verbreitet […] welche man unter den Ausdrücken: Isolirung der Wörter, Flexion und Agglutination zusammenzubegreifen pflegt." Agglutination happens by the attachment of affixes (p. 126-127). As most grammatical morphemes in Classic Mayan are suffixes, it is also interesting to hear that von Humboldt attributes meaning to them (pp. 126-127): "Das Suffix deutet die Beziehung an, in welcher das Wort genommen werden soll; es ist also in diesem Sinne keineswegs bedeutungslos." In an evolutionary classification, agglutination is considered as a mechanical process, a hybrid between isolating languages and true inflection as the paramount of an organic word formation (p. 130): "Zwischen dem Mangel aller Andeutung der Kategorieen der Wörter, wie er sich im Chinesischen zeigt, und der wahren Flexion kann es kein mit reiner Organisation der Sprachen verträgliches Drittes geben. Das einzige dazwischen Denkbare ist als Beugung gebrauchte Zusammensetzung, also beabsichtigte, aber nicht zur Vollkommenheit gediehene Flexion, mehr oder minder mechanische Anfügung, nicht rein organische Anbildung. Dies, nicht immer leicht zu erkennende, Zwitterwesen hat man in neuerer Zeit Agglutination genannt." Emphasis is original.

already one word (as a morphemic unit) can thus make a whole sentence (e.g. *a-winak-en*, '2SG.ERG-servant-1SG.ABS' as "I [am] your servant", PNG P. 3, G''1-G''2)[40]. The position of bound morphemes is also not arbitrary but has to concur with a certain paradigm for each part of speech. Although a concise outline is still pending for Classic Mayan, the ranking has been described for several Mayan languages and parts of speech (e.g. CHR [Fought 1967: 186], Ch [Kaufman and Norman 1984: 95], CHN [Smailus 1975: 189, 204, 210, 213], YUK [Smailus 1989: 20]).

Likewise, the *syntax* governing the sentence structure (Dürr and Schlobinski 1994: 102-106, 109-116) is very strict in Mayan languages (Campbell, Kaufman and Smith-Stark 1986: 547, England 1991) and determined by the verbal arguments (cf. DuBois 1987, Josserand 1988). Transitive sentences (Bricker 1986: 170-173) in Classic Mayan feature *V-O-S*[41]. The arguments are morphologically obligatory, but facultative in the syntax (by ellipsis). In intransitive sentences (Bricker 1986: 173-174), the basic word order is *V-S*. Stative sentences (Bricker 1986: 179-183) replace the verb by a non-verbal predicate that is mandatorily suffixed by an absolutive pronoun as the subject. Oblique arguments can be added, like adverbial or prepositional phrases, or arguments can be expanded by possessive phrases (e.g. Bricker 1981: 95, Macri 1991, 1997).

The most relevant parts of speech[42] we find in Classic Mayan are the following:

(1) *Pronouns*

- (a) *Dependent* (Bricker 1986: 51-91, Stuart 2005c: 43-52, Stuart, Houston and Robertson 1999, II: 17-21): divided into a set of prefixed ergative and suffixed absolutive pronouns (cf. Dixon [1994] on ergativity).
- (b) *Independent* (Hull, Carrasco and Wald 2009, Stuart 2005c: 52-53, Stuart, Houston and Robertson 1999, II: 24): in agent-focusing constructions and as demonstratives, formed by a demonstrative particle suffixed by the absolutive pronoun.

(2) *Verbs*

- (a) *Intransitives*
  - (i) *Root intransitives* (Bricker 1986: 150-160, Stuart 2005b, Wald 2007: 241-267): verbs to genuinely bind one argument (agent) by the absolutive pronoun and an optional nominal phrase. A special feature of intransitives (in general) is noun-incorporation

[40] Cases like these are facilitated by the fact that Mayan languages are copula-less in equational constructions (stative sentences) with a nominal or adjectival predicate plus the pronominal copula (Campbell, Kaufman and Smith-Stark 1986: 552-553). This feature, among many others, is shared with most languages of the linguistic area (or *Sprachbund* [Campbell 2006, Trubetskoy 1930]) of Mesoamerica (cf. Campbell, Kaufman and Smith-Stark 1986).

[41] V = verb, O = object, S = subject. Instead of using these syntactic argument terms, Mayan linguistics (and this study) rather applies semantic argument terms, thus the subject is often referred to as the *agent*, the (direct) object as the *patient*. Especially for copula-less stative sentences, the term *predicate* is apter than speaking of the verb.

[42] Although the present study restricts itself to some exemplary morphemes, some of them are homophonous but functionally different and thus appear with different parts of speech. The examples chosen for this study are detailed more in Chapter 2.1 and 3.1, and this overview provides selected further readings. Also, not all aspects of the morphology and morphosyntax can be considered, as Mayan languages are generally very productive, for an overview of a majority of modal and status as well as derivational affixes, see Lacadena (2001: 4-6), Wichmann (2004c: 451-452), Lacadena and Wichmann (2005b: tab. 3) and Kettunen and Helmke (2010: 65-71).

(Campbell, Kaufman and Smith-Stark 1986: 550-551, Grube 2004d: 74-75, Lacadena 2000a: 156-157, MacLeod 1990: 283-285). The mediopassive (Houston 1997: 295-296, Houston, Robertson and Stuart 2000: 330, Kaufman and Norman 1984: 103, Mora-Marín 2009: 138-145, Stuart, Houston and Robertson 1999, II: 30, Wald 2007: 268-311) is not totally understood, but seems to delete the agent to describe impersonal actions of a change of state or where the "agent acts by or upon himself" (Fought 1967: 206).

(ii) *Positionals* (Bricker 1986: 160-165, Houston, Robertson and Stuart 2000: 332-333, Hruby and Child 2004, MacLeod 1984: 241-249, Stuart 2005c: 73-74): a specially marked class of derived intransitives to describe the spatial position or orientation of the syntactic subject (cf. Knowles [1984: 361] for CHN root semantics).

(iii) *Derived intransitives* (Stuart 2005b: 69-73): verbs that have been formed by diathesis from root transitives. The passive (Bricker 1986: 155-160, Houston, Robertson and Stuart 2000: 332-333, Lacadena 2004b, MacLeod 1984: 238-241, 1990: 280-289) looses the active agent and makes the patient the intransitive agent. The antipassive (Lacadena 2000a, MacLeod 1984: 249, Martin 1997: 855-856) turns the transitive into the intransitive agent and deletes the patient (cf. Silverstein 1972: 357). Other derived intransitives can be formed out of other parts of speech, e.g. inchoatives from nouns or adjectives (Houston, Robertson and Stuart 2001b: 39-42, MacLeod 1987: 64-65, 2004: 312, Wald 2007: 375-377) to describe the becoming of something.

(b) *Transitives*

(i) *Root transitives* (Bricker 1986: 126-149, Stuart 2005c: 75, Wald 1994, 2007: 216-225): verbs to genuinely bind two arguments (agent/patient) by both sets of dependent pronouns and optional nominal phrases.

(ii) *Derived transitives* (Bricker 1986: 149-150, MacLeod 2004, Stuart 2005b: 76, Wald 2007: 216-225): verbs that have been formed by affixation out of other parts of speech, e.g. causatives (Lacadena 2000a: 166-167) from intransitives to express how the agent makes something happen to the patient (cf. Dixon 2000).

(3) *Nouns*

(a) *Primary* (Bricker 1986: 36-45, 92-120, Macri 1997, Stuart 2005c: 42-43): those lexemes that genuinely are a noun by semantic categories (cf. Rijkhoff 2008), e.g. names, appellatives, concrete and abstract. This categorisation (as well applicable to the secondary ones) also requires certain suffixes depending on their morphosyntax (Houston, Robertson and Stuart 2001b, Houston and Stuart 1998: 76, Stuart 1987: 25-28, 36, Zender 2004b), e.g. in the case of possession (Campbell, Kaufman and Smith-Stark 1986: 545-546, 549-550).

(b) *Secondary* (Stuart 2005c: 57-61): derived from other nouns or other parts of speech, e.g. abstractives (Bricker 1986: 43-44, Houston, Robertson and Stuart 2001b: 7-13, 25-46) or instrumentals (MacLeod 1990: 314-316, 337-338, Wichmann 2002a: 6, tab. 1). Derivation as well includes the nominal use of verbs (but e.g. cf. the problem of nominalised antipassives [MacLeod 2004: 317-322, Wald 2007: 314]).

(4) *Adjectives*

(a) *Primary* (Bricker 1986: 38-39, 120-123, Kelley 1976: 187-188): genuine word to provide quality to a noun or nominal phrase or qualify a state of being.

(b) *Secondary* (Bricker 1986: 123, Houston, Robertson and Stuart 2001b): derived from other parts of speech, such as nouns (Houston, Robertson and Stuart 2001b: 32-42, Stuart, Houston and Robertson 1999, II: 42) or as the participle of verbs (Bricker 1986: 125-126, MacLeod 1987: 60).

(5) *Numerals*

(a) *Proper* (Rafinesque-Schmaltz 1832: 44, Thompson 1950: 51-54): used as cardinal numbers in a vigesimal system including zero, as ordinal numbers with the 3SG.ERG (Bricker 1986: 109-110). There are also collective numerals for undetermined quantities.

(b) *Numeral classifiers* (Macri 2000, Miram 1983, Prager 2003, Thompson 1950: 54-57, 1972b): suffixed to numerals as counting units, exhibiting a semantic categorisation of the counted[43] (also compare Rijkhoff [2008] on classifiers as a noun class).

(6) *Prepositions* (Bricker 1986, Josserand, Schele and Hopkins 1985, López Oliva 2012, Macri 1991: 59-61, Stuart 2005c: 56-57): to introduce a prepositional phrase of special, temporal, comparative relation or content.

(7) *Adverbs* (Stuart, Houston and Robertson 1999, II: 33-35): the definition of adverbs in Classic Mayan is still somehow blurred, but I generally consider all qualifiers preceding a verb as an adverb[44].

(8) *Particles*: all other words that do not belong to the prepositions or adverbs, like the focal marker *i[']* (Houston 1997: 296, Law 2006: 47).

The fuzzy definition of adverbs also calls for another important aspect to be tangled: the representation of temporality in Classic Mayan. We can contrast *tense* as a deictic system and *aspect* as a non-deictic system (Houston 1997). It has become common sense to consider aspect as the system of

[43] The closest parallel from Indo-Germanic languages that otherwise have only a very restricted and optional use as in "one staple of wood" are physical units. When their quantity is given, the unit must necessarily be given to avoid confusion: "the length is 100 kilometres" (and not meters, yards, stadions, zhàng or kellicam).

[44] As adverbs belong to the class of particles, there are often definitional overlaps in the literature. I classify *ma'* (Gronemeyer 2004: 49, Looper 1991), "not", as an adverb as it modifies the quality of a verb. Problematic are those cases that have been considered as aspect markers (Stuart 2005b: 67, Stuart, Houston and Robertson 1999, II: 33-35), as it also interferes with the question of temporal marking of Classic Mayan. Consider the case of a preposed **xa**, instead of being a future marker *x–* / __#a (which it certainly is in some contexts, see footnote 290), *xa[']* could also be transcribed as the adverb "already, sometimes, again" (Gronemeyer 2004, II: 92, Gronemeyer and MacLeod 2010: 55) based on CHL *xʌ'* (Aulie and de Aulie 1978: 113): "de vez en cuando". In this sense, the aspect system in Classic Mayan is expressed by time adverbs (cf. Bricker 1986: 170). It is also to question whether calendrical information (Long Count, Distance Numbers, Calendar Round) can be considered as adverbials of time. They consist of a numeral and a numeral classifier (often neglected in writing, thus it could be considered a "zero grapheme" [Prager 2003: 6]). The Distance Number furthermore may take a temporal deictic adverbial enclitic (Wald 2000, 2004b, 2007: 522-712).

choice (Robertson 1992: 51-52, 63-72) in Classic Mayan. Various works outlined the verbal morphology and considered temporal markings (e.g. Bricker 1986: 125, MacLeod 1984).

Houston, Stuart and Robertson (Houston 1997, Robertson, Houston and Stuart 2004) assumed that texts are generally written in an incompletive aspect (**Ci** / __# < *√-Ø* [Houston 1997: 293-294]) and earlier or terminated actions are marked by a completive suffix (**Ci=ya** / __# < *√-iy-Ø* [Houston 1997: 293-294, Stuart 1987: fn. 6, Stuart, Houston and Robertson 1999, II: 28-30, 34])[45]. The alternative model (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999) basically considers all texts to be written in the completive aspect (**Ci** / __# < *√-i-Ø*)[46]. Anteriority or futurity relative to the completive aspect are marked with temporal deictic enclitics (=**ji** / __# < *√=[i]j-Ø* for later and =**ji-ya** / __# < *√=[i]j=iy-Ø* for anterior events)[47], also applicable to Distance Numbers. There was apparently no aspect contrast made for transitive verbs (MacLeod 2004: 298, 324). Some =**ji(-ya)** spellings will be part of the hypotheses this thesis is examining, so I will just refer to Chapters 2.1.5 and 3.1.7.

1.2.2.3 – Classic Mayan Language Affiliation

It is almost impossible to provide an extensive coverage of all arguments concerning the proper affiliation of Classic Mayan and its relatives in terms of genetics and position in the family tree as well as language geography (Bricker 1986, 2007, Brown and Wichmann 2004, Campbell 1984, England 1988, Fisher 1973, Fox 1978, Grube 2004d, Houston, Robertson and Stuart 2000, Houston, Stuart and Robertson 1998, Justeson 1985, Justeson and Campbell 1984, 1997, Justeson et al. 1985, Kaufman 1972, 1976, 2003, Kaufman and Norman 1984, Lacadena 2001, Lacadena and Wichmann 2002, 2004, 2005a, McQuown 1956, 1971, Mora-Marín 2005b, 2010a, Osborne 1989, Robertson 1977b, Storniolo 2008, Stuart, Houston and Robertson 1999, Wald 2007: 802-969, Wichmann 2002a, 2006a) in this introduction. I will restrict myself to outline certain theories and features. Specific arguments will again be considered when appropriate and necessary in the following chapters and for the conclusions.

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[45] The transcription *–i:y* should hereby reflect the pCh completive status marker *–*i* (Kaufman and Norman 1984: 102-104). It is alternatively taken as a declarative (indicative) suffix (Houston, Robertson and Stuart 2000: 329) for single argument verbs said to be retained from pM *–*ik*. It may be confused with the thematic *–i* of ECh (Kaufman and Norman 1984: 104) of derived intransitives, for which analyses as the antipassives **CH'AM=wi** < *ch'am-w-i* (QRG St. F, B5 [Lacadena 2000a: 163-164]) or **pa-ka=xi** < *pak-x-i* (NTN Dwg. 48, A1 [MacLeod and Stone 1994: 178]) have been proposed. These observations would concur with the alternative view of temporal marking. However, some languages (e.g. CHN [Knowles 1984: 72], ITZ [Schumann Gálvez 1971: 44], MOP Schumann Gálvez 1997: 108, 120]) have completive *√-i*-3SG.ABS only, otherwise *√*-ABS among root intransitives and positionals. Also see Chapter 3.1.1.1 and footnote 127 for further discussion.

[46] It was also proposed that it may explain the abundant =**yi** / __# spellings for the so-called mediopassive (Houston 1997: 296, Houston, Robertson and Stuart 2000: 329) as $–V_1y$-*i*. However, $–V_1y$ is known as a completive marker for ECh of a specific set of root intransitives (Fought 1984: 53, Kaufman and Norman 1984: 103-104, tab. 13). For example, Houston (1997: 296) denies this possibility for Classic Mayan, arguing by disharmonic spellings and split ergativity. This exemplifies the still poor understanding of the so-called mediopassive where the **yi** spelling might indeed just be the indication of an allomorphic status suffix $–V_1y$ mutually exclusive to *–i*. Testing these possibilities will be one case of the hypotheses (Chapters 2.1.2.2 and 3.1.4.1).

[47] The =**ji** / __# spelling in these cases was also considered to mark nominalised antipassives (Robertson, Houston and Stuart 2004: 284-287) or to mark derived intransitives (Robertson, Houston and Stuart 2004: 283-284). While the latter is accepted by MacLeod, she broadens the spelling to indicate a *–V(V)j* resultative (perfect) suffix, questioning the thematic suffix for nominalised antipassives (MacLeod 2004: 317-322).

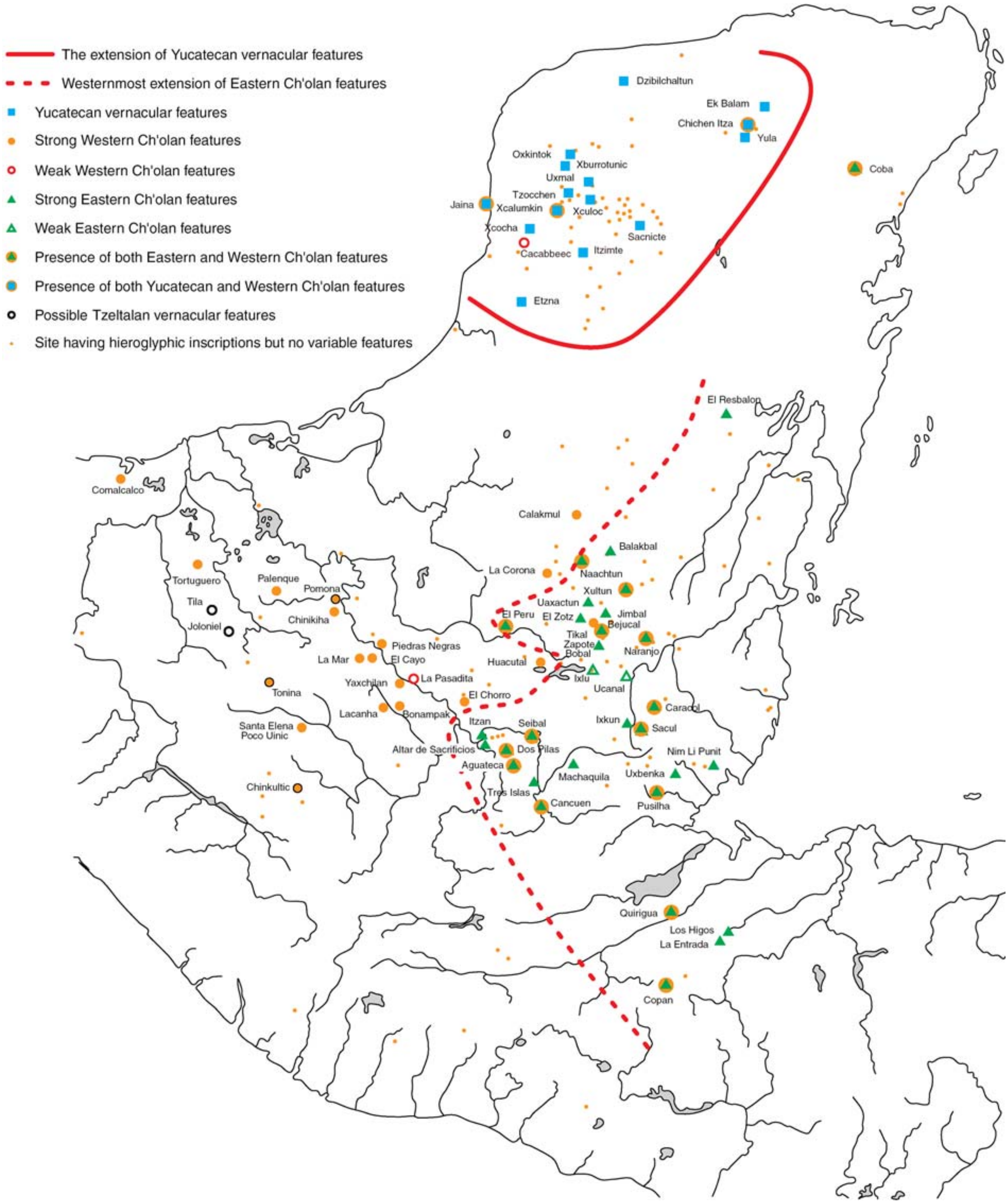


Figure 2: The assumed distribution of Lowland Mayan languages in Classic times, summarised by current epigraphic evidence. After Wichmann (2006a: fig. 1).

Proposals for the affiliation of Classic Mayan basically rely on geographical, lexical and morphological arguments (cf. Houston, Robertson and Stuart [2000: 323-325, tab. 1] for an overview). We can still agree with Schele (1982: 9) that "some form of early Ch'olan is […] the language of the Classic inscriptions", as confirmed by a number of subsequent studies. The nature of the ancestral stage (Riese 1971: 213) has ramifications for its positioning within the Ch'olan branch, as well as the influence of other Mayan languages.

Figure 3: The assumed distribution of Mayan languages in Colonial times, 16th century. Height relief by Shuttle Radar Topography Mission (SRTM), PIA03364, courtesy NASA/JPL-Caltech. Sven Gronemeyer, after MacLeod (1987: 225).

Houston, Robertson and Stuart (2000) operate with *Classic Ch'olti'an* as a predecessor of recent Ch'orti' via extinct Ch'olti' (Robertson 1998). It contains distinct morphological characteristics only featured in Eastern Ch'olan languages (Houston, Robertson and Stuart 2000: 327, fig. 1). Despite the existence of vernacular languages (possibly visible in different genres), Classic Ch'olti'an is thought to represent a prestige language for writing only (Houston, Robertson and Stuart 2000: 322)[48].

This view was, in part, shaped by the concentration on the verbal morphology (also cf. Hruby and Robertson 2001). By the use of free and bound morphemes[49], Wichmann (2002a) found patterns to be the same in Classic Mayan and Ch'orti', but not in Ch'olti'. This counterview was taken up by Robertson (Robertson 2004a). Mora-Marín (2005b, 2009) also opposes the Classic Ch'olti'an approach by tracing the development of three grammatical suffixes[50].

A far greater importance of vernaculars in the script is admitted by Lacadena and Wichmann (Lacadena 2000b, Lacadena and Wichmann 2002, 2005a). Wichmann (2006a: 280-284) summarises how certain suffixes are indeed at least of proto-Ch'olan ancestry, and Eastern Ch'olan innovations remain in the eastern parts of the Mayan area (e.g. a mediopassive suffix retained in Ch'orti' [Beliaev and Davletshin 2003]). Besides genuine innovations, those of Western Ch'olan percolated to eastern regions, but not vice versa (e.g. the distribution patterns of positional suffixes [Hruby 2002, Hruby and Child 2004]).

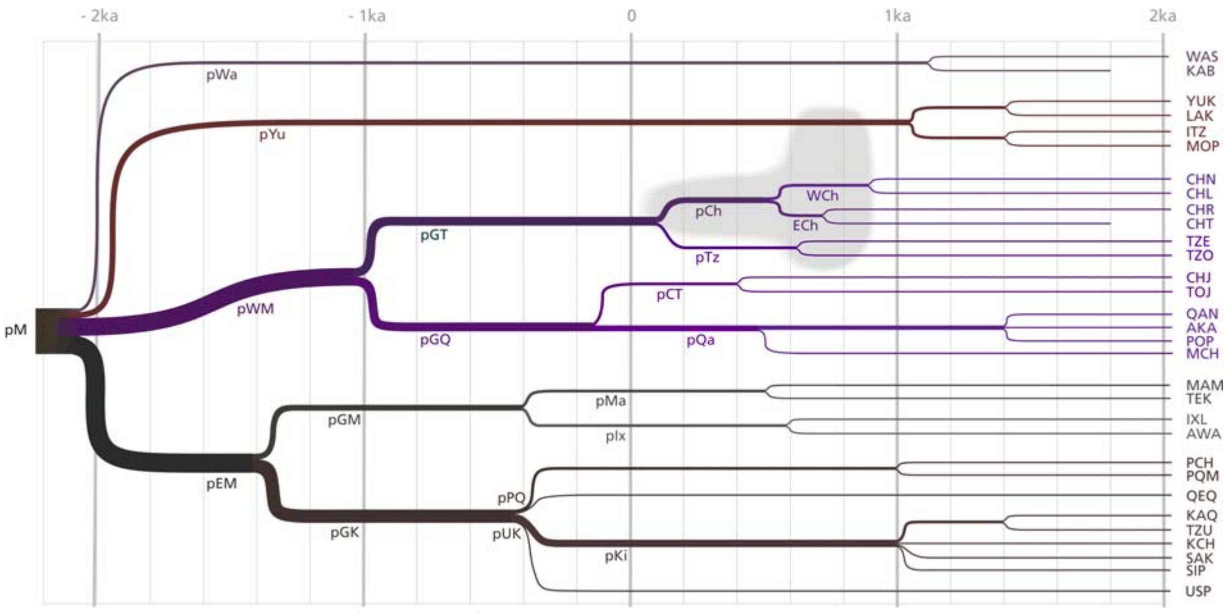


Figure 4: Phylogenetic classification of Mayan languages with chronology. Grey area indicates the Classic Mayan sphere including proven vernaculars (see Figure 2). Sven Gronemeyer, after several sources (Brown 1991: tab. 1, Campbell 1984: figs. 1, 2, tab. 1, England and Elliott 1990: xviii, Houston, Robertson and Stuart 2000: fig. 1, Kaufman 1976: fig. 1, tab. 1, Lacadena and Wichmann 2002).

[48] As visible in the general use of grammatical and lexical morphemes in the inscriptions of Yucatan (Houston, Robertson and Stuart 2000: 335) and the codices. However, Yukatekan vernaculars are rather frequent in the texts, but do not comply with the regions where languages of this family are spoken today (Figure 2). Also refer to other studies that testify a major Ch'olan influence (Bricker 2000b, Wald 2004a) for 'Yucatec' sources.

[49] Wichmann investigated the cases of the *–l-ib* instrumental of positional verbs, the 1SG.ERG dependent pronoun, and the words *sus*, "to scrape" and *chahuk*, "lightning".

[50] These are the *–bu* causative suffix for positional verbs, the *<h>…-aj* passive of CVC transitives and the *–V_1y* mediopassive suffix. Mora-Marín (2005b: 23) also offers proto-Eastern Ch'olan for Classic Mayan.

As a summary, a map (Figure 2) of the expansion of Western and Eastern Ch'olan evidence together with Yukatekan and Tzeltalan vernaculars can be given, regardless of distinctive diachronic considerations. This map can be compared with the reconstructed borders of Mayan languages (Figure 3) during the Early Colonial period.

Also see Law (2011: 62-77) for a more granular reconstruction of the language geography of the Mayan languages. He specifically provides a diachronic perspective from the Pre-Classic period to modern times. Specifically, we must acknowledge that much of the lowlands were inhabited by Yukatekan speaking people until about 100 AD (Josserand 1975). Fox and Justeson (1982) even proposed a persisting influence, a view that was objected by Lacadena and Wichmann (2002: 289-291). A considerable Yukatekan substrate might still be distillable from the hieroglyphic inscriptions (e.g. see footnotes 404 and 459).

As there are still caveats against the Classic Ch'olti'an hypothesis, I will also follow older phylogenetic models of the Mayan languages (Figure 4) that discriminate Eastern and Western Ch'olan[51].

1.2.3 – Analytical Premises

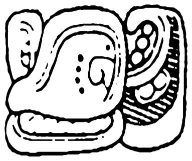
When analysing Maya hieroglyphs, the epigrapher usually applies a multi-tier, interlinear description (Figure 5) to cover all steps necessary for a successful decipherment, although with each subsequent step, confidence may get lost because of unknown readings or unclear morphological segmentation.

Without necessarily providing an image of the glyph(s) analysed, the inscriptional source of the sample will be give. The provenance is given by a three-letter code (Graham 1975, Riese 2004), following by the inscription type and designation (Graham 1975). Other specific abbreviations may apply (e.g. Kerr numbers for ceramics and portable objects [1997, 2000, 1989, 1990, 1992, 1994], specific abbreviations for certain texts [e.g. Ringle and Smith-Stark 1996: 17-32], museum inventory numbers, etc.). If possible, the position in the block matrix follows.

[51] Although I am aware of the fact, that Acalán CHN (Smailus 1973, 1975), traditionally assigned to the WCh branch is more closer to the eastern CHT (Houston, Robertson and Stuart 2000: fn. 2). To what degree the high innovativeness of CHL leads to its 'outlier' role hasn't yet been satisfactorily answered. Furthermore, the dates given for the furcation of the different language families are based on traditional methods of glottochronology and historical linguistics. These however must still be considered with care and the premises chosen. Compare with the automated date calculation by a Levenshtein distance based algorithm (Holman et al. 2011) with a set of 40 words out of the Swadesh list. For Mayan, the dates of the divergence into daughter languages are way too late (Holman et al. 2011: tabs. 1, 6), e.g. for Ch'olan by almost 40%. But the calibration value (split into ECh and WCh by about 400 AD [Holman et al. 2011: 846]) also seems far too early, judging by the epigraphic evidence. The phylogenetic tree of this algorithm also shows quite a diverging picture for the Mayan languages (Müller et al. 2013) when compared to Figure 4, and certainly more refined data are needed for a computational approach.

a 

TRT Mon. 6, O2
(1) 22A:MRB.ZUF:33K
(2) **^{2}tzu=jo=ma**
(3) *tzu<Ø>tz-j-om-Ø*
(4) complete<PASS>-THEM-FUT$_{PRED}$-3SG.ABS$_{AGENT}$
(5) it will be completed

b 

YAX HS. 3, Step I Tread, D1
(1) ZY9’ZC1:AA1.ZU1
(2) **chu-ku=ka=ja**
(3) *chuk-k-aj-Ø*
(4) capture-PASS-THEM$_{PRED}$-3SG.ABS$_{AGENT}$
(5) he was captured

c 

K2777, J1
(1) AM7:32M.3M6
(2) **WAY^{ya}=si**
(3) *way-[i]s*
(4) spirit.companion-ABSL
(5) spirit companion

Figure 5: Examples of epigraphic analysis standards applied in the thesis. **a)** After Gronemeyer and MacLeod (2010: 8), **b)** after Lacadena (2004b: fn. 101), **c)** after Zender (2004b: fig. 8.2a).

(1) is the *classification* of all discrete graphemes, i.e. the attribution of a unique identifier to a sign by a catalogue. The thesis will exclusively make use of the “New Catalog” (Macri and Looper 2003b, Macri and Vail 2009)[52], except where other catalogues need to be cited for historical reasons (Grube 1990a, Ringle and Smith-Stark 1996, Thompson 1962, Zimmermann 1956). The physical position of each grapheme in the block and its relation to other signs is indicated by a couple of separators (Gronemeyer 2006b: 69, Thompson 1962). In contrast to linguistics, grapheme strings are not put into angle brackets.

(2) is the *transliteration*[53], i.e. the step of attributing a phonemic value to a sign and converting it into a Latin alphabet equivalent, as per graphematic premises. In the sense of a broad transliteration, no reconstructed sounds are indicated (cf. Lacadena and Wichmann 2004: 132-134). The guidelines are based upon the proposals by Fox and Justeson (1984a) and G. Stuart (1988). Several innovations stimulated by Whittaker (2009, personal communications in December 2009 and January 2010) are made. Diacritics will be placed superscript in front: ^{2} for the doubler, $^{\#}$ for the day sign cartouche. A sign that is primarily used as a phonemic complement or indicator is also placed superscript. Words are separated by a blank space,

[52] Signs not included in the “New Catalog” will approximate the classification scheme as much as possible. For example, any animal sign that is not identifiable will receive the code A00, while any feline would be coded with AT0. The classification on this level remains unique, as the first volume (Macri and Looper 2003b) left lacunae that were closed with additional signs from the codices in the second volume (Macri and Vail 2009). In case graphical variants of a sign need to be distinguished, the index is put in brackets, e.g. ZZ1(1) as **CH’ICH’** ~ **K’IK’** and ZZ1(2) as **DAY.SIGN.CARTOUCHE**. The indices follow the first volume only, for two reasons: (1) the second volume inserted codical variants to the beginning, rather than the end, thus shuffling the indices from the first volume, (2) the variants from the codices are often just the difference between carved and painted style, rather than being a new variant (as the first volume also neglects to a large extent painted variants from portable objects). Closest approximation to an indexed variant is always sought, otherwise, unclassified variants receive a zero index, e.g. ZX6(0).

[53] Historically, the analytical steps of transliteration and transcription have always been labelled in reversed order in Maya epigraphy. I will concur with general linguistics (Crystal 2008: 490, 494) in the thesis.

signs within a morpheme string by hyphens, morphemic boundaries are indicated by an equal sign[54]. Aliases are put in small caps. No angle brackets are used here as well, but bold face is applied.

(3) is the *transcription*, i.e. the step of representing the sounds for a morpheme string in Classic Mayan language. In the sense of a narrow transcription, reconstructed and analysed phonemes are inserted, as well as separators (Comrie, Haspelmath and Bickel 2004) for a *morphological segmentation*. In contrast to linguistics, the phoneme string is not put into slashes, but formatted in italics.

(4) is the *morphological analysis*, i.e. the grammatical description of all morphemes represented in any morpheme string (or 'word' in a broader sense). It might be necessary to also indicate the syntactic role of a morpheme or word in the analysis, these are given in subscript behind the last part of each morphosyntactic unit. The abbreviations for the analysis are given in Appendix A.

(5) is the *translation* into English, trying to be as verbatim as possible.

1.3 – Source Materials

SEVERAL TYPES OF SOURCES NEED to be consulted for an epigraphic analysis with a linguistic background. Obviously, the primary sources are the hieroglyphic inscriptions as the pool for all samples appropriate for the orthographic, grammatical and linguistic analysis. To retrieve a data sample as extensive as possible and to increase the chances to include rare and unusual spelling varieties, the thesis aims to make use of all available texts.

The total number of inscriptions as a hieroglyphic corpus has never been fully assessed, although there are estimations. Riese (2004) lists a totality of 431 archaeological sites, from which 415 are reported to feature hieroglyphic texts on any kind of medium and any kind of quantity. In the best case, we have an – at least at the time of publishing – (more or less) exhaustive documentation in photos or drawings for an individual site or geographic region or a selected category of its textual witnesses (e.g. Beetz and Satterthwaite 1981, Graham 1967, Graham 1972, Graña-Behrens 2002, Gronemeyer 2006b, 2013, Grube 2008, Jones and Satterthwaite 1982, Maler 1903, 1908a, b, Maudslay 1974, Morley 1938,

[54] I am aware of the fact that a certain degree of interpretation is influencing the transliteration and may not always comply in a one-to-one relation, e.g. when a phonemic complement integrates into a spelling at a morphemic boundary. In such cases, a hierarchy needs to be found after a thorough determination of the graphemes most likely function (see also Chapter 2.2.1). Hence the **CV/CVC** structure also sometimes makes a distinction difficult, segmentation is indicated after the sign in question (as a graphematic segmentation rather than a morphosyntactic). The challenge of an interpretational transliteration is also given for other writing systems, especially for cuneiform texts (Reiner 1973: 4, 23, 57-58, fn. 2, 29) with their high degree of polysemy and polyphony (Glassner 2003: 2). Maya epigraphy has reached a level of understanding, where alterations in transliteration practices actually may contribute to comprehend the epigrapher's analytical rational without being *per se* wrong. In case no reasonable segmentation for morphemes on the graphematic level can be achieved, the standard hyphen is used as the fallback solution. Refer to Figure 5 for examples.

Nalda 2004, Prager 2002a, Teufel 2004), at which most notably the *Corpus of Maya Hieroglyphic Inscriptions* (Graham 1978, 1979, 1980, 1982, 1986, 1992, 1996, Graham and Henderson 2006, Graham and Mathews 1996, 1999, Graham and von Euw 1975, 1977, 1992, 1997, Mathews 1983, Stuart and Graham 2003, von Euw 1977, 1978, von Euw and Graham 1984) is aiming at.

The corpus of ceramic vessels does not feature hieroglyphs on every example, but the most notable collection (Kerr and Kerr 1997, 2000, Kerr 1989, 1990, 1992, 1994) has nearly 1,900 pieces, with many other pieces published elsewhere (e.g. Reents-Budet 1994, Robicsek and Hales 1982). A lot of ceramic object lack provenance, a problem also true for other types of artefacts, including monumental inscriptions (e.g. Mayer 1978, 1980, 1984, 1987, 1989, 1991, 1995). We can add the codices to the corpus, the Dresden (Anders and Deckert 1975, Förstemann 1880), Madrid (Anders 1967), Paris (Anders 1968, Love 1994) and possibly the Grolier (Coe 1973); as well as numerous other pieces from museum collections, bodegas, archives (e.g. Schele and Mathews 1979); published or unpublished.

Not all of these texts might be useful for the analysis, as erosion may prevent a reading of the texts or the inscription might not contain any spelling example appropriate for the data base.

In order to be classify the epigraphic data, the analysis needs to be complemented by linguistic data as the secondary source of information for the relevant Mayan languages (see Chapter 2.5.1 for a detailed overview). These are lexicons to determine the part of speech of any given lexeme and to semantically identify it and grammars to functionally determine the morphosyntax, i.e. the combination of a lexical class with a particular suffix. All lexicons (e.g. Boot 2009b), grammars (e.g. Bricker 1986) and studies on specific morphosyntactic premises of Classic Mayan not only base on epigraphic data, but also from reconstructions of a multitude of Colonial and modern sources that complement each other. In specific cases, ethnohistorical and modern text collections (e.g. Arzápolo Marín 1987, Fought 1972, Hofling 1991, Miram 1988, Smailus 1975) may also be consulted to see how certain patterns of suffixation function within a certain semantic, syntactic or genre-specific environment and to transpose them to the epigraphic data (cf. Houston, Robertson and Stuart 2001b: 9, Miram 1994)[55].

1.4 – Desiderata

By the description of the current state of research, five main areas connected to the thesis topic can be identified that require a more thorough investigation in terms of grammatology and linguistics[56]. To all in intents and purposes, these areas are more or less interdependent. When the thesis aims at the study of spelling patterns at morpheme boundaries, it cannot be

[55] Caution must however been taken in applying these linguistic data. We may encounter innovations, functional shifts or other phenomena that need to be filtered by historical linguistics. The discussion of the linguistic foundations for each showcase in Chapter 3.1 detail these issues, also refer to Chapter 2.5.1 for a broader methodological outlook.

[56] This chapter cannot be a thorough review of the open fields in Maya epigraphy and linguistics and each and every of the areas discussed could be enriched with various examples and further decided argumentations. Other

done without considering other areas. While the focus is clear, results from the analyses that contribute to such neighbouring aspects will not be neglected. This overview is a brief deductive summary of the current state of research.

(1) *Writing system typology*: An unambiguous understanding of the nature and functioning of the writing system is key for any study that does not simply utilise epigraphy as an auxiliary science. Following Weingarten's critique (2011), typologies have to become more granular by comparative approaches. In finding the differences to other morphographic, syllabic and mixed systems, we are able to better recognise the similarities and narrow down the nature of Maya writing. Due to the relevance, some initial thoughts by comparison with Japanese and Sumerian are already given in the introduction.

(2) *Sign properties*: There is no proper writing system typology without a definition of the properties of the graphemic lexicon. While a basic pleremic-cenemic dichotomy is beyond doubt, we still lack concise studies on a number of questions. Some of the issues have already rectified in the review of the current research, as functionally determined sign properties influence all other orthographic conventions and our attempts of reading reconstruction – another key prerequisite for the present study. Further clarification is needed to what orthographic depth the two sign classes of morphographs and syllabograms can merge or overlap and have developed towards a phonographic system. How can other sign classes be identified to contribute to or alter the typology? While morphosyllables (Houston, Robertson and Stuart 2001b) and semantic determiners (Mora-Marín 2008) are discarded, semantic classifiers might be worth further investigation.

(3) *Harmony rules*: The question of orthographic depth not only tackles the graphemic lexicon and principles like underspellings, but also the much debated mechanisms if and how complex vowels are indicated. Both models proposed (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004) are still debated, but above all lack a statistical relevant foundation. Both articles provide the data analysed, but it is not overly clear whether the data set is exhaustive and includes all lexemes known from hieroglyphic inscriptions and how many examples for each lexeme have been analysed. The subsequent enlargement of the harmony rules to other use cases (Lacadena and Wichmann 2005b) is as well not ultimately answered and is connected to the next area.

(4) *Affixation patterns*: This question, as the core topic of the present thesis, at the same time is probably the most affected by all other mentioned desiderata. Sign properties, harmony rules and the morphosyllabic approach necessarily affect not only the spelling of (single) lexical morphemes, but even more the affixation patterns. It would make a difference in the

problems related to grammatology, phonology or grammar are not even tangled here as they are more loosely tied to the core question of the thesis. The advantage of having the desiderata open in form and content is to point all general directions for further research, as the present study will surely not take care of all of them. At least the desideratum complex of the affixation patterns will recurrently be rendered more precisely throughout the thesis. The data compiled for the study may also help other researchers in closing further gaps.

orthography if affixes would be spelled by morphosyllabic signs or not or whether harmony rules are suspended at morpheme boundaries or not. The spelling rules may not only be governed by these factors, as Mora-Marín (2003a, 2004a, 2010a) elaborated with the 'affixation conventionalisation hypothesis'. Consequent underspellings of weak-consonant suffixes are a possible explanation. Dogmatic where necessary and dynamic were possible might be one economic rule of the hieroglyphic orthography, owed to the agglutinative Classic Mayan language and its allomorphs. With the research on sign properties and harmony rules evolving and changing, it is even harder to at the same time define affixation patterns on *this* basis.

(5) *Language affiliation*: The proposal of 'Classic Ch'olti'an' as a static elite *lingua franca* has much appeal in comparison with fossilised Middle Egyptian as the sacral language of the New Kingdom (Baines 1983: 584, fig. 2) as a vernacular in a true diglossia situation (cf. Callender 1984: 197-198) or with Classical 'Ciceronian' Latin as the high language of the Roman Empire[57] and one antetype for later occidental intelligentsia (cf. DellaNeva 2007). However, it is quite unlikely. Not only in terms of its problematic genetic affiliation (Mora-Marín 2005b, 2009, Wichmann 2002a), but also by its assumed graduation into the Ch'olan branches and interference with non-Ch'olan and absorption of Ch'olan vernaculars. As the epigraphic data demonstrate, the language situation was much more diverse and away from a standard language, depending on the text genre and purpose, much closer to a *sermo vulgaris* in some respect[58]. While evidence is found in the inscriptions (cf. Figure 2), it has not yet put under a more granular review to combine time and space and eventually trace moving isoglosses[59]. – The prominence of a particular Mayan language will also affect considerations like the representation of the aspect system or allomorphs or cognates. This again should be echoed in the spelling practices under the assumption that the orthography was deep enough to do so.

[57] Marcus Tullius Cicero's style is considered as one of the hallmarks for a Roman orator (Quintilianus I.O.: X.1, 105ff.): "Oratores vero vel praecipue Latinam eloquentiam parem facere Graecae possunt: nam Ciceronem cuicumque eorum fortiter opposuerim. […]Quorum ego virtutes plerasque arbitror similes, consilium, ordinem, dividendi praeparandi probandi rationem, omnia denique quae sunt inventionis. In eloquendo est aliqua diversitas: densior ille, hic copiosior, ille concludit adstrictius, hic latius, pugnat ille acumine semper, hic frequenter et pondere, illic nihil detrahi potest, hic nihil adici, curae plus in illo, in hoc naturae." But more authors are added to the 'Golden Age' of Classic Philology (Teuffel 1870: 216), defined between 83 BC (death [sic!] of dictator Lucius Cornelius Sulla Felix) and 14 AD (death of emperor Gaius Iulius Caesar Augustus).

[58] Though on official monuments a more formal speech and discourse was chosen (Josserand and Hopkins 2002: 358-360). But again it was not as close to a standard language by dialectal and regional differentiation. Compare the case of the word January (Kluge 1899: 187) with Central German *Januar* (from High Latin *ianuarius*), as the standard word in Germany and Switzerland, with the Upper German *Jänner* (from Late Latin variant *ienuario*), as the official form in Austria and South Tyrol (but regionally spoken in southern Bavaria and Baden-Württemberg, as well as among Schwyzerdütsch, which by itself is an interesting case of diglossia).

[59] One might speculate, if the Classic Maya collapse and the ceasing to erected inscribed monuments as the binder of a more formalised language across the Maya area actually fostered the furcation of the languages of the Greater Tzeltalan branch. The actual glottochronological dates (Figure 2) do not necessarily suggest this.

1.5 – Objectives and Scope

WITH THE DESIDERATA OUTLINED, I can now narrow down the aims for the present thesis according to its scope of being a contribution to the spelling practices and phonology of Classic Mayan. I broadly allocate my objectives to (1) a thorough methodology for the investigation and explanation of hieroglyphic spelling practices and their implications for pronunciation, (2) the formulation of selected hypotheses and their methodological analysis and (3) the discussion of the results and their review against the state of research sketched in this introduction.

1.5.1 – Methodology

An almost unavoidable detriment in the review of many studies dealing with Classic Mayan grammatology and linguistics is their condensed epistemic value. It is sometimes hard to judge how differentiated the outcome of a study might be, how many examples were used to arrive at a certain result, or what premises were taken. This is often due to space restrictions and a critical review is often required by a good knowledge of the data themselves. However, as indicated above, the corpus of inscriptions is extensive, and sometimes one must wonder whether any result from an epigraphic study is just a fragmentarily presentation of a fuller data sample or indeed an 'impressionistic' conclusion. Furthermore, the result of a hypothesis or analysis may (and certainly will) be biased by the intuitive beliefs of an epigrapher, preconditions from a certain school, as the harmony rules or aspect system of Classic Mayan demonstrate. A format as the present thesis is thus an apter place to unfurl a thorough methodology and investigate and present a broad basis of data. Nevertheless, even the best methodology and most substantial data base cannot prevail personal beliefs to a certain degree (see Chapter 3).

The thesis aims to conduct a full survey of the hieroglyphic corpus as it was outlined in Chapter 1.3 to obtain a data base of a significant number of samples for analysis. Each sample will also be filed with a number of meta data to allow distributional analyses of the specific feature at any time at any locality[60]. As per the topic outline of Chapter 1.1.2, grammatical affixes (specifically suffixes) and their spellings are these features. The different orthographic renderings and their morphosyntactic and semantic role also need to be reflected on a lexical and grammatical basis before the language geographical and diachronic attribution. The selection of graphematic affixation patterns as a method for this thesis is 'to put the cart before the horse' in a positive connotation for an extinct language. The empirically guided investigation of the spelling patterns yields results for two purposes. It will approach sign properties and harmony rules without prejudice, instead of seeking a way to apply existing models on that question. And it will thus serve as a tool in reconstructing the phonemics of Classic Mayan.

[60] These aims are, at least in parts, inspired by the empirical and statistical approach chosen by Colas (2004) to analyse the structure and distribution of Classic Maya name phrases.

1.5.2 – Hypotheses and Results

A preliminary model for the vowel integration of spellings at morpheme boundaries has already been given (Gronemeyer 2011b), rethinking the morphosyllabic approach (Houston, Robertson and Stuart 2001b). Guided by the methodological framework, four specific showcases (see Chapter 2.1) will exemplify the spelling practices from the hieroglyphic corpus and be tested against the working hypotheses (Chapter 3.1) of the thesis.

To comply with the methodological imperative of an all-encompassing approach, several tiers of analyses will be applied. The purpose is to organise the amount of data at a granular level at first and to arrive at intermediate results. The analyses therefore start lexeme-based at a micro-level before the results are merged together and compared within one of the four showcases. The parameterisation of the samples with (if possible) a date and provenance allows to establish a matrix for the language geographical and spatial distribution. In the macro-perspective, the data and results of all four showcases are taken together.

The results are expected to have an open outcome with respect to the thesis topic. Being in favour of a model that considers orthographic patterns to change upon affixation to reflect an as close as possible phonemic rendition of the spoken word does not necessarily mean that the analyses are to prove the hypothesis. Scientific progress can also be achieved by negative results: it is evidence that some other model has to be the correct one. And as the second face of the same coin, the data sample of this thesis might support further research in pursuing this question.

1.5.3 – Discussion and Critical Review

The methodology will also ensure a control mechanism for the four defined showcases. For three of them, a control group of an analogue suffix is defined. In the discussion of the results from the analysis proper, these cases and their results gathered in an independent workstream can be provided to the main analyses and be discussed with them. The significance of the overall outcome will increase and benefit by this cross-check.

The main focus of the discussion is the interpretation of the results against the desiderata formulated. First of all, it has to be dedicated to the principal thesis topic, the orthographic conventions to spell grammatical morphemes. Secondly, the question can be pursued of how these spelling practices indeed are capable of being a contribution to the phonemic reconstruction of the Classic Mayan language. And finally, the course set by these arguments will bring further answers for the questions of sign properties and language affiliation. More precise than before, these problems can be addressed with respect to language geography in a diachronic perspective. Out of the data base, a number of models can be generated to apply to specific questions, such as single-feature synchronous mapping, a correspondence analysis or ultimately in a multivariate, three-dimensional scatter plot.

Furthermore, the results of the analyses and their discussion can be contrasted with and evaluated against the current state of research. This includes not only the areas defined for the desiderata, but also the comparison with other studies related to the topic. Several works (Hruby 2002, Hruby and Child 2004, Hruby and Robertson 2001) examined the distribution (both over time and space) of positional suffixes. Finally, the results of the thesis allow the prospect to potential impacts on future Maya epigraphy.

2 – METHODOLOGY

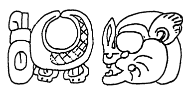
> "Language is a labyrinth of paths. You approach it from *one* side and are familiar with it, you arrive at the same place from a different one and you are not familiar with it."
> *Ludwig Wittgenstein, 1921: Philosophische Abhandlungen, §203 (author's translation)*

TO STRICTLY FOLLOW A CONSISTENT approach in the thesis, the methodology elaborated in this chapter will serve as its red fleece thread. Its consequent implementation in the analyses is to minimise or at best prevent to arrive from different places at the spelling practices at morpheme boundaries, to pass the labyrinth and defeat the Minotaur of piecemeal epigraphic study.

The methodology is basically divided into the definition of and rationale for (1) the showcases and corresponding control groups, (2) a classification of spelling schemes, (3) the data compilation, (4) the analytical work flow and premises, and (5) the interpretational framework.

2.1 – Analytical Showcases

LIKE THE OTHER MAYAN IDIOMS, Classic Mayan is very productive as an agglutinative language. That means that it exhibits a large number of affixes[61] to mark morphosyntactic complements, semantics, parts of speech, and for derivation (see Chapter 1.2.2.2). Productivity also means that several derivations are possible with a root, including the necessary status or aspect markers or pronouns for the word. Thus, it is not untypical for Mayan morpheme strings to enumerate several suffixes in a row or even bring back a derivation to the original lexical class, as for example:


YAX Lnt. 60, C6-D6

SAK=ja=la SUTZ' > *sak-j-al sutz'*
white-INCH-ADJS bat
whitened bat

This feature inherent to the language calls for two methodological premises. Firstly, the investigation of the thesis topic, where the analyses need to be adequately and numerically restricted for a reasonable and manageable complexity. Secondly, the analyses must be aware that suffixes may affect each other in their spellings and a filter (Chapter 2.5.3.2) is needed to handle these cases. To examine patterns of the orthographic realisation, it is necessary to gather epigraphic data for the spellings of an affixed lexeme, ideally in all possible derivations and syntactic functions that are subject to the restrictions made.

The suffixes of Classic Mayan can phonemically and morphologically be classified into four distinct types: (1) invariable vowel, (2) root vowel-harmonic, (3) variable vowel and (4) non-VC. As the

[61] See Lacadena (2001: 4-6), Wichmann (2004c: 451-452), Lacadena and Wichmann (2005b: tab. 3) and Kettunen and Helmke (2010: 65-71) for concise, but not exhaustive listings of affixes.

latter exhibits no initial vowel by following a general *CV(C)* pattern, it will not be dealt with in the present study, but discussed for the sake of completeness. Another case is the 'temporal' *–Vj* suffix that as per the current state of research can be analysed in two different grammatical ways. It would thus be an intriguing case to test and examine whether the spelling practices may support one or the other model.

In the following, I will characterise each of the suffix classifications and present one example that will serve as the main analytical showcase in the thesis, totalling in three. Each of these will be complemented by another suffix presumed to be of the same phonological shape to serve as a cross-check for the analyses made for the main types. Both selections, showcases and control groups, are supposed to provide transposable results for any suffix that belongs to the same type. The thesis will therefore effectively deal with seven suffix forms, two from each *–VC* type plus the 'temporal' suffix.

The selection for each type bases on the current state of research (Chapter 1.2.2.2) with subject to revision, and the methodology will only provide the rationale for choosing it. The showcase definition is rather considered to be a guideline along which the gathering of the linguistic data can commence. Therefore, this task (Chapter 3.1) may and likely will arrive at different results for certain showcases or aspects thereof.

It should also be noted that a number of suffixes are homophonous, but functionally different. The thesis can take advantage of this circumstance to investigate whether this has any effect on the spelling practices. This prompts for the functional determination of a suffix by comparison with lexicons and grammars (Chapter 2.3.2). In what way identical spellings can indicate morphemes of different functions and how divergences need to be isolated was pointed out by Beliaev (2004). Based on the showcase selection and morphosyntactic function, each suffix will linguistically be discussed in more detail prior to the analyses (Chapter 3.1), confirming, complementing or refusing the current state of research.

The decision to discuss specific morphemes more by their phonological structure rather than by their function causes the issue that eventually only one allomorph of a suffix may be analysed. Other alloforms may be out of scope and no internal comparison is possible within one functional group. However, the results of the seven showcases should be broad enough to be transposed to cases not considered.

2.1.1 – Invariable Vowel Suffixes

2.1.1.1 – Test Group 1: Suffix *–aj*

The suffix *–aj* is primarily known as the thematic suffix for the passive voice (Bricker 1986: 155-160, Houston, Robertson and Stuart 2000: 332-333, Lacadena 2004b: 166-171, MacLeod 1984: 238-241, 1990: 280-289), but generally serves as a thematic marker for certain derived intransitives (Wichmann 2004c: 451). Many verbs in the corpus appear in a passive derivation, hence there should be a sufficient number of data for a statistical significant examination. As transitive verbs (Test Group 2) will also be analysed, the discussion of spelling practices can directly compare potential orthographic shifts for different affixation with specific lexemes. Here, spelling variations can be observed for the attested regular *CV<h>C-aj* and *√-k-aj* of CVC and *√-{n, w}-aj* of non-CVC transitives.

Some very few mediopassive derivations from the Eastern Ch'olan branch are proposed to appear in the epigraphic record, which are *√-k'-aj*, discussed by Beliaev and Davletshin (2003), and *√-p-aj*, as proposed by Lacadena (2004b: fn. 101), possibly among others (Chapter 3.1.1.1). These feature the thematic *–aj* as well, in contrast to the mediopassive described in Control Group 2.

Some very few examples of the *–aj* suffix are relicts of a Pre-Classic pGT and Early Classic pCh and Late Classic vernacular GTz **<h>…-aj* intransitive positional marking (Houston, Robertson and Stuart 2000: 333, tab. 5, fig. 4, Lacadena 2004b: 169-170). The same morpheme is also retained in pTz (Kaufman 1972: 141) and especially modern TZE (Kaufman 1971: 53), thus some vernaculars of this form are epigraphically known (Lacadena 2004b: fn. 90, Lacadena and Wichmann 2005a: 35). The *–aj* is also found in the pCh and ClM completive aspect suffix of positionals with *–l-aj* (see Chapter 2.1.4).

The third morphosyntactic environment for *–aj* to mark derived intransitives is the inchoative of nouns and adjectives (Boot 2002: 15, Houston, Robertson and Stuart 2001b: 39-42, MacLeod 1987: 64-65, 2004: 312, Wald 2007: 375-377). It has sometimes been confused with a passive (Lacadena 2009: 42) and also seldom been considered to be ~ **–Vj* (Guenter 2003a: 27, Lacadena 2003: 852-854, 2009: 42, Zender 2004b: fn. 130). A side observation for these examples might touch the question of orthographic differences for the mere root spelling.

The same suffix is also used as a marker for quantifiable unpossessed/absolutive nouns (Houston, Robertson and Stuart 2001b: 42-46, Houston and Stuart 1998: 76, Stuart, Houston and Robertson 1999). Zender (2004b: 195, 199-200) specifically attributes this suffix to "items of personal property", contrasted to *–is* for body parts and *–Ø* for kinship terms. Houston, Robertson and Stuart (2001b: 43) suggest an ~ **–Vj* for Classic Mayan based on pM and retained in EM cognates. The thesis opts for an invariable *–aj* as a significant number of spellings actually prompts for this interpretation.

There are thus four cases of a homophonous suffix (with the last two likely without any allomorphs) to be compared for their orthographic realisation which is commonly **Ca=ja / __#**. The first three cases also often interfere with the temporal deictic enclitic (cf. Wald 2007: 648-652), but otherwise only feature a *–Ø* status marker for the completive (Kaufman and Norman 1984: tab. 13). Although not included among the showcases, it would be interesting to observe spelling alterations for the fourth case upon possession. It is also important to keep in mind those cases of nominalised passive forms with a possible underspelled possessive *–Vl* morpheme (Lacadena 2004b: 188-190). A couple of cases are also known to likely represent vowel syncopation (see footnote 37) when followed by another suffix.

Not considered is the supposed *–Vj* nominalising (cf. MacLeod 2004: 317-322, Robertson, Houston and Stuart 2004: 284-287) suffix and its *–aj* allomorph (cf. Lacadena 2004b: 178, Tokovinine 2007: 18-19). This is for a couple of reasons. The allomorphs are unclear in their vocalisation and function. Ch'olan languages also know a *–yaj ~ –ya* suffix for transitives (cf. MacLeod 2004: 322-324, Robertson, Houston and Stuart 2004: 285-286), whose relationship to *–aj* is unsafe. The interpretation of some of these cases also interferes with test group 4 (Chapter 2.1.5). The apparent *–Vj* nominaliser found with positional roots also far from being resolved when comparing forms like *u-tz'ak-aj* (e.g. PAL T18S, 255) with *tz'ak-b-uj* (PAL T18S, 264a). A discussion of such forms will nevertheless appear where appropriate.

2.1.1.2 – Control Group 1: Suffix *–el*

Although not overly common, the suffix *–el* has some interesting implications. It is used for part/whole possession of inherent (and autonomous) body parts (Bricker 1986: 105-106, Houston, Robertson and Stuart 2001b: 9, 30-32, 42-43), i.e. when being part of the possessor (Blair 1964: 50, Schumann Gálvez 1997: 95). The absolutive body parts with *–is* take *–Ø* upon possession (Zender 2004b: fig. 8.2), and *–el* has never been discussed in context with them. Apparently, those body parts marked with *–el* take *–Ø* as an absolutive marker (thus it may not only be retained to kinship terms).

The same form is also sometimes regarded as an allomorph of a *–Vl* abstractive suffix (Houston, Robertson and Stuart 2001b: 7-8)[62]. However, as far as its affixation with the word *ajaw* is concerned (Stuart 2005c: 58-59), Zender (1999: 108-111) has convincingly demonstrated that the underlying form is in fact *–lel* (following Harris [1993: ix]), and that frequent underspellings simply render a **le** / __# in these cases. Other cases of an *–el* suffix appear outside a possessed context, for which they also have been taken as abstractive suffixes (e.g. Lacadena 2004b: fn. 126), but *te'-el* (also cf. Beliaev, Davletshin and Tokovinine 2009: 257-258, Stuart 2005a: 135-136) may either suggest an allomorph of the –V_1l attributive marker (Houston, Robertson and Stuart 2001b: 12-13, 32-36); or in fact rather an intimate possession (Houston, Robertson and Stuart 2001b: 31, fig. 14) expressed by a nominal compound instead of a possessive phrase[63]. The latter can as well be suggested for the cases of *bak-el way-w-al*, otherwise also assumed to be abstractive (Stuart 2005c: 58-59)[64]. Indeed, ethnohistoric evidence advocates that 'co-essences' can be considered as body parts[65].

[62] Interestingly, Morán (1685-95) who is cited as evidence for the use of the suffix in CHT lists all other allomorphs as examples except *–el*.

[63] The same may be true for those cases of CHL suffixed numeral classifiers (Attinasi 1973: 155) to express a part/whole relationship of the counted (e.g. fingers on a hand, days of a month). Also see Bricker (1986: 104) for another explanation.

[64] The reading *way-w-al* bases on the spellings **u=WAY=wa=la** on K3395 (Bruder 1981: fig. 7) and **BAK=le** $^{\mathbf{wa}}$**WAY=wa=la** on PAL 96G, I2 and is supposed to involve a syncopated *–Vw* nominaliser (Boot 2009b: fn. 285) to apply to the morphograph PE4 (otherwise the *way* form of the Tikal emblem glyph, Grube and Martin [2000, II: 75], Schele [1985a: 62, fig. 5]). While 'preposed' phonemic complements (Mora-Marín 2008: 198-200) sometimes appear after the morphograph, the case from PAL 96G makes it clear that the suffixed **wa** is often underspelled, compare to **BAK=le** $^{\mathbf{wa}}$**WAY** on PAL PNFS, F1 and **BAK=le WAY=la** on PAL TFLD, A3.

[65] Compare to the episode in the *Poopol Wuuj*, where the Hero Twins send out a mosquito to bite the Lords of the Underworld to learn their names. As the text (f. 24v) explains (cf. Schultze-Jena 1944: 74), the mosquito is a hair from the shin of *Hunahpu*: *<mahabi hunoc xquizach v bi quiz quibijh quibi conohel ta xeti rumal rizmalvvach vchec hunahpu xumich vbic mana quitzih xan rixetiovic>*. – "Not one of their names was missed until all of the names were named when they were bitten by a hair that Hunahpu had plucked from the front of his knee. It

While there might be more than one grammatical function to examine and compare, the spelling patterns of partitive possession have already been considered significant for further investigation as an argument against morphosyllables (Boot 2009b: 5, Gronemeyer 2011b: 331-332) and a good test case for harmony rules in the suffix domain (cf. Lacadena and Wichmann 2005b: tab. 3). The spellings of lexemes marked by the suffix can also be compared with those taking a zero morpheme. The examples might also further clarify on the semantics of part/whole possession and their manageable amount chiefly from object tags and dedication formulae (Houston and Taube 1987, Stuart 2005a) is suited for a control case.

2.1.2 – Root Vowel-harmonic Suffixes

2.1.2.1 – Test Group 2: Suffix –V_1*w*

Analogue to the *–aj* passive thematic suffix, an abundance of examples comes from the modal marker –V_1*w* for the indicative of transitive CVC verbs (Bricker 1986: 126-128, MacLeod 2004: 296-297, Stuart 2005c: 75, Wald 1994, 2007: 216-225), although the pCh evidence argues for –V_1 rather (Kaufman and Norman 1984: tab. 12), which could be an allomorph. The importance of the distinction between CVC and non-CVC (derived) roots was already indicated for the passive thematic suffix and is also true for transitives. Non-CVC and derived transitives have thus far only received attention when appearing in a non-initial position. Here, they rather seem to take a *–V(V)j* suffix (see footnote 46), considered as a resultative 'perfect' suffix (MacLeod 2004, Robertson, Houston and Stuart 2004: 283-284). The latter case is outlined in more detail in Chapter 2.1.5. To what extent non-CVC and derived transitives appear in the indicative in the inscriptions has only received little attention (MacLeod 2004: 311), but these rather seem to apply certain *–V* and *–CV* suffixes (also see Chapter 2.1.4).

Antipassive derivations might also result in a –V_1*w* derivational suffix (Wichmann 2004c: 452), as some spellings suggest (Lacadena 2000a: 165-166, fn. 16). However, the literature (Lacadena 2000b: 342, 351-352, Mora-Marín 2004b) also generally refers to the morpheme as a general *√-Vw* pattern without a root harmonic vowel, and it is possible that in many instances there is just a syncopated form *√-w* (and also ~ *√-n* [Lacadena 2000a, MacLeod 1984: 249], ~ *√-x* [MacLeod and Stone 1994: 178]). The latter is likely if any **Ci** / __# spelling is considered to imply the completive marker of intransitives (see Chapter 1.2.2.2 and footnote 45) or here specifically the thematic *–i* of derived intransitives. Antipassives on *√-*V_1*w* are therefore analysed as well to investigate their phonology further with implications for other antipassives, and eventually compare them with the transitive suffix.

wasn't really a mosquito that had bitten them." (Christenson 2003: ll. 3706-3711). Although physically separated, the *way* is still connected to *Hunahpu* by senses (Gronemeyer 2001: 26), and even as a body part of voluntary control. Compare to CHR *u-nawal-ir*, "its *nawal*" (Wichmann 1999: 129).

While the transitive marker never seems to co-occur with the temporal deictic enclitic (MacLeod 2004: 298, 324), its orthographic interaction needs to be factored in with the antipassive (cf. Wald 2007: 655-660). Because of the supposed general **CV_1=wa** / __# spelling for transitives and **CV_1=wi** / __# for the antipassive, the effect of the harmony rules in the suffix domain (cf. Lacadena and Wichmann 2005b: tab. 3) for potential complex vowel allomorphs can be tested as well. Cases of *–V* derived transitives are also included to better understand if they also follow a specific **CV=wa** / __# spelling pattern like CVC transitives and to compare their spellings with the 'temporal' suffix.

2.1.2.2 – Control Group 2: Suffix $–V_1y$

The case of $–V_1y$ for root intransitives and the so-called mediopassive (Houston 1997: 295-296, Houston, Robertson and Stuart 2000: 330, Kaufman and Norman 1984: 103, Mora-Marín 2009: 138-145, Stuart, Houston and Robertson 1999, II: 30, Wald 2007: 268-311) at first seems to be orthographically closer to the antipassive spelling (with a likely root vowel reflex) from the main group than to the transitive marker. Yet, it is not clear whether the completive status marker adheres to those intransitives realised by **CV_1=yi** / __# spellings or not (see footnote 45), as $\sqrt{}$-V_1y intransitives are opposed to $\sqrt{}$-*i* (Kaufman and Norman [1984: 103, tab. 13] who again follow Smailus [1975]) in Eastern Ch'olan, where $\sqrt{}$-V_1y first innovated (Kaufman and Justeson 2009: 228). They seem to be mutually exclusive, but grammars suggest that lexemes can take either one or the other (Chapter 3.1.4.1). Thus, the case of the mediopassive could be related to the common **CV_1=wa** / __# spelling for completive CVC transitives.

Like the main group, harmony rules are ought to effect the suffix (cf. Lacadena and Wichmann 2005b: tab. 3). Their potential influence becomes especially interesting when considering the completive status marker actually been written or not and how this linguistically driven choice for a syllabogram would impose disharmony on a spelling where it might not be intended. Also, the temporal deictic enclitic needs consideration (cf. Wald 2007: 653-654).

Only very little epigraphic attention has been paid to the possibility of $*–V_1y$ as an Early Classic pCh (Houston, Robertson and Stuart 2000: tab. 5) and vernacular pTz intransitive positional marker (Wichmann 2006a: tab. 1), the latter still productive in TZE (Kaufman 1972: 142). Some proposed vernaculars in Tonina and Pomona (Lacadena and Wichmann 2005a: 35-36) do not have strong evidence with their =**ji-ya** / __# spellings for this group. Other examples[66] might be found to further investigate this epigraphic postulate, as well as an inchoative derivation still productive in TZE.

[66] There might be one case on TRT Jd. 1, A6 with **PAT=ya** < ***pat-[a]y-Ø* (Gronemeyer 2006b: 97), also interpretable as a mediopassive (see footnote 395). Early Classic examples that still might reflect a (pre-)pCh stage are thus far not discussed in the literature.

2.1.3 – Variable Vowel Suffixes

2.1.3.1 – Test Group 3: Suffix –*Vb*

The suffix –*Vb* is known to indicate the instrumental (Grube 1991: 230, MacLeod 1990: 314-316, 337-338, Wichmann 2002a: 6, tab. 1) of both irreducible and derived nouns. Its vowel is considered unpredictable (Houston, Robertson and Stuart 2001b: 16), and attestations from modern languages (see Chapter 3.1.5) might provide a clue. Nevertheless, the Classic Mayan instrumental is often simply transcribed as –*ib* (Grube and MacLeod 1990: 177, Houston, Robertson and Stuart 2001b: 17, fns. 6, 7) because of the abundance of **CV_1=bi / __#** spellings, yet there are other possibilities (Gronemeyer 2011b: 331) attested. As linguistics suggests, different vowels might semantically be determined (Houston, Robertson and Stuart 2001b: 16), but also phonologically by the root to which the suffix is attached. While certain spelling patterns are indicative for a specific vowel, other factors would need to be considered as well. The vowel might be conditioned by phonological premises (Gronemeyer 2011b: fn. 3), and one possible explanation – although never investigated – is sonority hierarchy (Selkirk 1984: 110-119, Sievers 1881: §§ 518-519, 528-536) and its impact on the morphophonemics of a Mayan morpheme (cf. Fought 1967: 51-72, 85-136, Storniolo 2008: 31-32), and distinctive features like height (Attinasi 1973: 29). There might be a relationship between (1) the lexical syllabic nucleus to be mirrored or inverted in sonority, (2) the root coda or (3) the root rime and the vowel of the suffix.

Again, an underspelled morpheme to follow (most likely a –*Vl* suffix) might as well interfere with any spelling. The irregular suffix vowel makes this type especially interesting to test the harmony rule application in the suffix domain (cf. Lacadena and Wichmann 2005b: tab. 3).

2.1.3.2 – Control Group 3: Suffix –*Vl*

The type of a generic –*Vl* suffix is especially common among Mayan nouns as a nominaliser or derivational suffix of root nouns and status marker (e.g. abstraction, possession [Lacadena and Wichmann 2005b: tab. 3]). To restrict the choice with regards to both any proposed vowel complexity and syntactic/semantic function for a manageable control group, the –*Vl* nominaliser of verbs is chosen.

There are several forms considered, based on the part of speech to be derived. For Classic Mayan, they have been suggested to be specific with respect of the suffix vowel, as –*e'l* of intransitives and –*o'l* of transitives (Lacadena and Wichmann 2005b: tab. 3). While each of them could thus be considered as a group 1 invariable vowel suffix, I will take them together as one group of variable vowel suffixes. There are examples (see Chapter 3.1.6) for an intransitive –*el* by **Ce=la / __#** spellings, but this also attested for transitives[67]. In contrast, the transitive –*ol* has been suggested to be just an allomorph

[67] Compare intransitive basis **yo=che=la** < *y-och-el* (TIK MT. 176, T2) vs. transitive basis **ti JOY-ye=la** < *ti jo<'>y-el* (YAX Lnt. 26, T1). Note that the latter can likely be analyses as an intermediate passivation, thus providing an intransitive form to explain –*el*.

of a *–V₁'l* (Lacadena and Wichmann 2005b: 28) nominaliser of root transitives. The alterations observable in the epigraphic record advocate that variable vowel allomorphs exist, and that these do not necessarily need to reflect the root vowel or are restricted to a specific verb type.

Besides the benefit to investigate the question of the vowel value, the control group can also test the harmony rules (cf. Lacadena and Wichmann 2005b: tab. 3) and investigate to what extent a complex vowel is existent. Spelling interferences with other suffixes to follow may also occur.

2.1.4 – Non-VC Suffixes

As per the thesis topic which is to investigate vowel integration of spellings at morpheme boundaries, the majority of non-VC suffixes will not be considered. They can roughly be divided into (1) *–CVC*, (2) *–CV*, (3) *–V*, (4) *–C*, (5) *–CVCVC* and (6) *–VCVC*.

The majority of the non-VC morphemes follow the CVC pattern, most prominent the ones to mark intransitive positionals, which are *–wan* and *–laj* (Bricker 1986: 160-165, Houston, Robertson and Stuart 2000: 332-333, Hruby and Child 2004, Hruby and Robertson 2001, MacLeod 1984: 241-249, Stuart 2005c: 73-74). They are almost invariably realised by **=wa-ni** and **=la-ja** / __# (Mora-Marín 2003b: 198) and feature no orthographic interaction with the root spelling by their **CV-CV** realisation[68]. Other CVC cases are the abstractional *–lel* (Zender 1999: 108-111, 141), best known for its use in the "affix cluster" (Mathews and Justeson 1984: 227-228) *ti ajaw-lel*, the plural marker *–tak* (see footnote 15), the Yukatek causative *–kun* (Lacadena and Wichmann 2005a: 32, Wichmann 2006a: tab. 1) or the toponymic *–nal* (Stuart 1998: 380, Stuart and Houston 1994). A recent suggestion was made for *–tzil* as an emphatic or reverential suffix[69]. The case of numeral classifiers has also been mentioned

[68] This is actually a little simplifying summary. From language internal arguments (Kaufman and Norman 1984: 106-107), we may segment *–l-aj* with the *–l* intransitiviser of positional roots (compare to positional instrumentals in Chapter 3.1.5) and *–aj* as a completive aspect marker (also see Chapter 3.1.1.2 for alternatives). The case of *–wan* is more complicated. According to Kaufman and Norman, *–wan* derived from **–(a)w-an*, with *–w* as an intransitiviser and *–an* as a cognate to the CHL and CHR inchoative. However, GQa has *–an* as a positional stem formative (Table 14), but it is either not cognate or the Ch'olan inchoative is reflex of a pWM positional marking (see footnote 172). Also see Kaufman (1994, A 4b: 3) for a pM **–w* intransitiviser of positional roots, possibly as a specialisation of a generic **–w* suffix from which also the antipassive emerged. For ClM however, the case of **=wa-ni** has been considered to feature two distinct characteristics. Its disharmonic spelling should be the result of a complex suffix vowel ***–waan* as a logical consequence of the Lacadena and Wichmann rule set (2004: 130-131, 2005b) and secondly, the **ni** should include the *–i* status marker (Houston, Robertson and Stuart 2000: 329). It is considered absent from *–laj* (as it is spelled by a final **ja**), although Kaufman and Norman reconstruct **–la(j)-i*, because it is presumed to have historically developed out of the adjectival (stative) positional suffix *–V₁l* and the root positional **<h>…-aj* featuring the *–aj* thematic in pCh, GTz and Pre-Classic ClM (Houston, Robertson and Stuart 2000: 333, tab. 5, fig. 4). The spelling for ***–wan-i* would concur with the other considerations on **Ci** / __# spellings, but the long vowel is not considered in this study based on the linguistic comparison with cognate forms from other Mayan languages. In the case of *–laj*, the spelling can change to **=la-ji** when followed by the temporal deictic enclitic (cf. Wald 2007: 660-661). In any case, especially *–wan* shows that the intransitive positional marking was perceived as an indispensable unit. Hence, *–wan* and *–laj* are considered as CVC suffixes and the underlying *–l-aj* is not considered among the test group 1 cases for analysis. As already mentioned, these suffixes feature no spelling interaction with the root and their orthographic analysis might not contribute to its internal vocalisation any further.

[69] Worked out between Péter Bíró, Albert Davletshin, Sven Gronemeyer, Guido Krempel, Christian Prager and Elisabeth Wagner on January 14, 2011 by **u=BAK=tzi-li** < *u-bak-tzil* on YAX Lnt. 10, F7. Also attested with **ya=na=ba=tzi-li** < *y-a[h]n-ab-tzil* (YAX St. 31, A2, note the synharmonic spelling change from the regular

(see footnote 24). At this point, those for counting days deserve a special mention, particularly *–hen ~ –hew* (Lacadena and Wichmann 2005a: 33, tab. 1, Wald 2004b: 238) and *–bij*[70] in Distance Numbers.

Suffixes of CV-type are very rare. The major one is the causative suffix *–bu* of intransitive positionals (Houston, Robertson and Stuart 2000: tab. 5, Kaufman and Norman 1984: 106, Lacadena 2000a: 166). It is usually realised by =**bu** / __# spellings, but occasionally followed by other verbal suffixes. Otherwise, only *–ma* (Lacadena 2001: 6) has been attested as an antipassive derivational morpheme in Ch'olan[71].

Pure vowel suffixes will also not be considered in the thesis, except three cases: (1) $-V_1$ as a possible allomorph of the $-V_1w$ root transitive marker, (2) *–V* 'applicative' and 'factive' suffixes (MacLeod 2004: 312) of non-CVC and derived transitives (see footnote 83 and Chapters 3.1.3.1 and 3.1.7), and (3) those test group spellings where we may act on the assumption that an intransitive =**Ci** / __# spelling was chosen to include the *–i* suffix, but only because the preceding suffix is a syncopated showcase (like the antipassive). A good case of another *–V* suffix also in terms of orthographic practices is the imperative $-V_1$ suffix (Beliaev and Davletshin 2006: 25), provided by **CV$_1$-CV$_1$** spellings, but only a few cases are known.

In case of the simple consonant suffixes, at least the thematic *–aj* and antipassive $-V_1w$ brought forward in the test groups are syncopations and have an underlying VC form, thus they are not *sui generis* purely consonantal. On the other hand, some derivational morphemes, such as the already mentioned *√-{n, w, k}-aj* passivation, may always represent purely consonantal forms because of their [C.C] embedding, although the they may historically have been VC as well.

The only case of a CVCVC suffix is the optative *–na'ik* (Lacadena 2009: 44, MacLeod 1999, Tokovinine 2006: fn. 11) ~ *–ik* (Beliaev and Davletshin 2006: fn. 26), see footnote 164 for a possible derivation. The form VCVC is attested for the temporal deictic enclitic *=ijiy* (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999), but which can be analysed as *=ij=iy ~ =iy*.

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a-na=**bi** at the C.C morphemic boundary). Compare these with the use of *–tzil* in YUK, e.g. in the terms *yumtsil* and *yumtsilob* for "díos, señores-dignos-o-merecedores" (Barrera Vásquez 1993: 983) or *pektsil* "fama, buena o mala" (Barrera Vásquez 1993: 645) and ITZ honorific *–(in)tzil* (Hofling and Tesucún 2000: 115).

[70] The case of *–bij* deserves some more explanation. By the spelling of **2=bi-ji** < *cha'-bij* as "two days later" on TRT Bx. 1, A1 it has been assumed that *–bij* can be analysed as *–b=ij*, –ADV-TEMP (Wald 2000: fn. 7, tab. 1, 2004b: 235-237, fig. 9.14), compared to pCh **chab'-ij* < pM **kaʔb'-eej*, "pasado mañana // day after tomorrow" (Kaufman and Norman 1984: 138). Stuart (2005c: 64-65) considers /b/ to be a transitional consonant. While these analyses all operate with the temporal deictic enclitic, there may be another explanation (although the enclitic may have developed out of that, cf. Houston, Stuart and Robertson [1998: 292-293] for other examples). Fought (1967: 152-153) records the numeral classifiers *"?PII* as "Days ago" and *"?PIH* as "Days hence" as in the example *'TXAA"?PIH*, "[t]wo days from now". Thus, the glyphic *cha'-bij* could be analysed as 'two-CLF'.

[71] No hieroglyphic examples have been provided for this instance. However, I suspect that **ma-a to-sa**=**ma** on CPN Alt. Z, C3 is not to provide the proper name (Lacadena 2000a: fn. 12) of the altar, but a negated antipassive *ma' tos-m-a[j]*. The meaning of *tos* is unknown, however YUK has "polvorear" (Barrera Vásquez 1993: 808-809) and the context is about the altar dedication. Storniolo (2008: 189, 214-217) reconstructs **TZUTZ**=**jo**=**ma** as an ECh antipassive ***tzu<j>tz-ma* which seems dubious. This spelling is (1) also attested in WCh contexts (e.g. TRT Mon. 6, O2, YAX Lnt. 31, K5) as well, and (2) in all cases it occurs with future dates, also complying with other **Co**=**ma** future participle spellings among root intransitive verbs (see footnote 84).

2.1.5 – Test Group 4: Temporal Suffix *–Vj*

As indicated above in Chapter 1.2.2.2, a number of interfering views on aspect marking have been developed. Generally accepting the model proposed by Wald and MacLeod (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999), **=ji(=ya)** / __# spellings are considered to represent *√=[i]j(=iy)-Ø* temporal deictic enclitics. To delimit the amount of analytical samples and to compare with one alternative approach on these hieroglyphic spellings, only CVC and non-CVC root and derived transitives[72] are taken into account. For these, MacLeod (2004) has proposed the predominant **=ji(=ya)** / __# spelling to represent a *√-Vj(=iy)* < * *√-V-ej(=iy)* perfective suffix[73] to indicate anteriority with a continuing result. It is supposed to have developed from an original perfect participle. In support of a verbal phrase, Wald (2007: 312-433) considers these forms more specifically to be transitives in the resultative aspect[74].

Interestingly, while both root (in this case likely loosing *–V_1w*) and derived transitives do appear with **=ji(-ya)** suffixation, the opposite is supposed not to be true (cf. MacLeod 2004: 296-297): non-CVC and derived transitives should not occur with a plain status marker *–V_1w* in the inscriptions, as they are supposed to take a *–V* marker (see Chapter 2.1.2.1)[75]. Therefore, only a limited, but methodologically well manageable, number of spellings actually can be investigated with respect to spelling alterations between *–V_1w* (and likely *–V*) and *–Vj*. The enclitic *√=[i]j(=iy)-Ø* will not be taken into account.

Among (predominantly derived) transitives, it can therefore be investigated whether the root (and derivation morpheme) spellings imply either a *–Vj* perfect or resultative realised by **=ji(-ya)** for this word type or if this case again is just the realisation of a simple *=[i]j(=iy)* temporal deictic enclitic. In any case, the spelling practices can be compared to other cases of the enclitic outside the test group.

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72 The majority of these active perfect status verbs are derived transitive stems (MacLeod 2004: 294) and appear as the predicate of a secondary clause following the main clause in plain indicative status, containing any verb either marked by a *–V_1w* (transitive) suffix or more commonly any *–i*, *–aj*, *–V_1y*, *–laj/wan*, etc. (intransitive) suffixes (MacLeod 2004: 194, 305-306). These pairings of sentences serve a specific discourse structure: the grammatical subject of the first clause is the object of the secondary clause (Wald 2007: 313-314). It is coherent with the preferred argument structure (cf. DuBois 1987: 811, 827-829) and to provide a new information of action.

73 Following the general line of the thesis, I suspend the long vowel *–VVj* here until clarification is reached on the applicability of harmony rules not only in the suffix domain or linguistic evidence otherwise proves a complex vowel (Chapter 3.1.7). Kaufman (1994, A 2b: 73) reconstructs a long suffix vowel for pM because of morphophonemic reasons, and only when the suffix derives out of a /V_1+$V_{1/2}$/ combination. Otherwise, a short suffix vowel seems preponderant.

74 Another interpretation as nominalised antipassives comes from Robertson, Houston and Stuart (2004: 284-287). I rather second MacLeod (2004: 317-322) and Wald (2007: 314) to reject this proposal because of grammatical issues. Sanz González (2006: 618-630) suggests derived nouns, which might be the fact for an apparent invariable vowel nominaliser *–ij* (cf. Bíró [2011c: 304], MacLeod [2004: 321-322], Robertson, Houston and Stuart [2004: 284], Sanz González [2006: 621-626] for further discussion). Similarly, Stuart (2011: 3-4) also sees a sometimes verbal or nominal use. If there was a nominaliser *–ij*, it is functionally different and will not be considered here.

75 However, as MacLeod (2004: 300) admits, we e.g. have spellings like **yi=li=wa** (CHN T4L-L2, D2) or **yi=IL=wa** (UXL St. 13, D6). She suggests that *il* may have been treated as a CVC, although it is attested with a root marker *–a* (see footnote 494) in dictionaries. For such an *il-a* form, a spelling like **yi=IL=a** (NTN Dwg. 29, A3) is quite suggestive. Moreover, the existence of a spelling like **u=KAB=wa** (e.g. QRG Alt. O', I'4a) with a verb that is usually regarded as a derived transitive (e.g. MacLeod 2004: 294), demands to review the indicative marker of non-CVC and derived transitives and check their compliance with a *–V_1w* or *–V* form.

2.1.6 – Showcase Codes

To facilitate the analysis, each sample of a test or control group is associated with a number-letter code to identify the function within each group. This code is entered with each sample in the data base (as parameter 1f, see Chapter 2.3.1.1). The codes used in the analysis are provided in Table 4.

Group	Supposed Root Base(s)	Suffix Function	Code
1 **Test**	VER.TR	passive	1PASS
1 **Test**	VER.TR	mediopassive	1MED
1 **Test**	POS	intransitive positional	1POS
1 **Test**	ADJ, NOUN	inchoative	1INCH
1 **Test**	NOUN	absolutive	1ABSL
1 **Control**	ADJ, NOUN	possession	1POSS
1 **Control**	NOUN	attribution	1ATTR
2 **Test**	VER.TR	indicative	2IND
2 **Test**	VER.TR	antipassive	2ANTIP
2 **Control**	VER.TR	mediopassive	2MED
2 **Control**	VER.INTR	completive	2COM
2 **Control**	POS	intransitive positional	2POS
2 **Control**	ADJ, NOUN	inchoative	2INCH
3 **Test**	VER.INTR, VER.TR, POS, ADJ, NOUN	instrumental	3INSTR
3 **Control**	VER.INTR, VER.TR	nominalisation	3NMLS
4 **Test**	VER.TR	temporal	4TEMP

Table 4: Summary of the suffix functions according to the analytical showcases.

2.2 – Analytical Groups

WITH THE LINGUISTIC SCOPE DEFINED in the showcases, the graphematic prerequisites of the analysis can now be dealt with. Instead of dealing with all orthographic renditions from the samples directly in the analysis, a classification scheme is developed to which all spellings universally adhere. As a sample attribute in the data base (parameter 1g, see Chapter 2.3.1.1), the spelling scheme facilitates the further analyses.

2.2.1 – Premises

At this point, it is important to recapitulate some views and assumptions from the current state of research. As per functional graphematics (see Chapter 1.2.1.2), vowel integration can only take place with *–VC* suffixes which have been selected as showcases (Chapter 2.1) for this purpose. Based on full syllabic spellings, there are two possibilities given considering complex vowels:

(1) The final root spelling vowel gets integrated into the pronunciation of the suffix to follow, i.e. spellings are analysed as a continuous string across morphemes by the scribe. This eventually requires the root spelling to change upon suffixation.

For synharmonic spellings: $\mathbf{CV_1\text{-}CV_1}$ $< CV_1(h)C$
$\mathbf{CV_1\text{-}CV_2{=}CV_2}$ $< CV_1(h)C\text{-}V_2C$
For disharmonic spellings: $\mathbf{CV_1\text{-}CV_2}$ $< CV_1(\{', h\})C$
$\mathbf{CV_1\text{-}CV_3{=}CV_3}$ $< CV_1(\{', h\})C\text{-}V_3C$

(2) The final vowel of the lexeme spelling remains silent and no change to the spelling of the root will occur, i.e. spellings are analysed as discrete for morphemes. This requires the eventual reconstruction of the initial suffix vowel(s).
For synharmonic spellings: $\mathbf{CV_1\text{-}CV_1}$ $< CV_1(h)C$
$\mathbf{CV_1\text{-}CV_1{=}CV_2}$ $< CV_1(h)C\text{-}[V_{1/2}]C$
For disharmonic spellings: $\mathbf{CV_1\text{-}CV_2}$ $< CV_1(\{', h\})C$
$\mathbf{CV_1\text{-}CV_2{=}CV_3}$ $< CV_1(\{', h\})C\text{-}[V_{2/3}]C$

This scheme is of course very simplified and does not consider applications that may be superimposed on it as an orthographic convention for special cases. This may be true for synharmonic root spellings to possibly indicate a syncopated suffix to follow (see footnote 37). Furthermore, none of the cases would be a valid assumption if morphosyllabic signs (Chapter 1.2.1.2) are considered to spell suffixes[76].

Morphographic root spellings would basically parallel the first possibility of any **CVC=CV** combination possible as $CV_1(\{', h\})C\text{-}[V_{1/2}]C$, unless the provision of an additional syllabogram decides for either one or the other suffix vowel. In these cases, the additional syllabogram can theoretically be interpreted in two ways:

(1) primarily as a root complement: $\mathbf{CV_1C^{CV_{1/2}}{=}CV_2}$ $< CV_1(\{', h\})C\text{-}[V_{1/2}]C$
(2) primarily as a suffix indicator: $\mathbf{CV_1C\text{-}CV_{1/2}{=}CV_2}$ $< CV_1(\{', h\})C\text{-}V_{1/2}C$

The hieroglyphic spelling may appear the same in both cases. However, this point of view may often be too analytical and not reflecting the actual versatility in the writing system in certain instances. In cases of suffixation, such a syllabogram can take a hybrid function, as the spelling of **BAK-ke=la** < *bak-el* (CML U. 26, Pdt. 15, B1) suggests. As long known, **BAK** usually takes the syllabogram **ki** as a phonemic complement (Fox and Justeson 1984b: 41-42, Stuart 1985a: 98) to provide the root coda and possibly indicate the root vowel quantity by the disharmonic complementation (as with its syllabic

76 On a first glance, unaltered root spellings from the first case seem supporting to apply to morphosyllabic signs, as syllabograms (or morphographs) would be restricted to lexical morphemes and morphosyllables to bound morphemes. This would also be in favour with the view that morphosyllables are supposed to underrepresent morphophonemics (Robertson 2004b: 32-33), where the English participle ending *–ed* < [{əd, d, t}] / __# is compared with the mediopassive **=yi** / __# < $-V_1y$. Apparently, morphosyllables are considered here according to what Venezky (2004: 146, 147-148) calls the "constancy principle", which however he primarily attributes to root morphemes. The <d> endings are specifically mentioned as a major exception, thus derogating this analogy. But ever and anon, this morphosyllabic assumption is not backed by constant epigraphic evidence, nor by phonemics. Ultimately, it would again collide with the inseparability of the CV syllable as the smallest phonological unit (Blevins 1995) and "the CV morphosyllable is 'pronounced backwards'" (Robertson et al. 2007: 4). As argued elsewhere (cf. Gronemeyer 2011b: 318-321), VC syllables contradict the canonical Mayan scheme to require a consonantal onset (see Table 3). Even if [ʔVC] > [VC] / C__# might be possible as an analogue case to the prevocalic 3SG.ERG and some internal vowel spellings (see Chapter 1.2.21 and footnote 31), no such morphograph is ever used instead, as for example the K'IN.BOWL sign ZVE **EL** never substituting the common 1SC **le**.

substitutions **ba-ki**, e.g. YAX HS. 3, Step III, E2). In the given example, **ke** is used instead, it still acts as a complement by its congruency with the coda consonant, but has to abrogate its function according to the harmony rules, especially when considering the fixed rules proposed by Lacadena and Wichmann (2004: 109). Instead, its vowel is grammatically and functionally determined to bridge the root spelling with the following *–el* suffix whose consonant is provided by the **le** sign. Even more apparent is the hybrid function in a harmony rule compliant spelling like **CH'AK-ka=ja** < *ch'a<h>k-aj-Ø* (TRT Mon. 8, B54.). Unless there are cases like **CHUM**$^{\mathbf{mu}}$**=ja** < *chu<h>m-[a]j-Ø* (TNA Mon. 106, pC1) where a syllabogram can only function as a phonemic complement, the script seems to prefer this grapheme to bridge the morphemic boundaries, even by exhausting the syllabic grid to adapt spellings[77]. In other words: given the abundance of syllabic signs with all the different C-V combinations possible, the scribe had a diverse set to choose a spelling from. He would actually have made an effort in the decision to avoid integrative spellings (e.g. with **mu-ku=ja** < *mu<h>k-[a]j-Ø* on CAY Lnt.1, C13) that would not violate orthographic principles yet to determine.

Still, a thorough context analysis of the (1) part of speech, (2) morphosyntax, (3) syntactical function and (4) suffix function of the sample can decide how any **CVC-CV=CV** spelling was intended by the scribe. It is therefore also important to know the common unattached root spelling[78] by substitution patterns, how it follows the harmony rules (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004, 2005b, Robertson et al. 2007) and which first and second syllabogram vowel combination is predominant. The vowel of the grapheme indicating the bound morpheme also plays a role and whether it mirrors the suffix vowel or not. There is plainly a complex nexus of dependencies and constraints, and backed up by statistical arguments. But whenever the hybrid function is given, the vowel integration supersedes the primary phonemic complementation purpose of a syllabogram.

2.2.2 – Spelling Groups

Four groups can be defined to which any sample can be attributed with respect to the provision of the suffix vowel or not. The four spelling groups are facultative for any sample and mutually exclusive for one suffix function. The groups attempt not to presuppose an interpretational assessment before the analysis is done, e.g. spellings 'deviating' from the 'norm', like the rare transitive marking by **CV**$_1$**=wi / __#** instead of **CV**$_1$**=wa / __#**, otherwise typical for antipassives (see test group 1)[79]. The pat-

[77] This tendency towards full phonemic spellings is probably furthest developed in the 'scribal school' (Lacadena 2008b: 1, 18) of Chichen Itza with abundant syllabic spellings breaking up the limits of morphemic units and glyph blocks. A good example is **k'a-k'u-pa-ka-la** < *k'a[h]k' u-pakal* (e.g. YUL Lnt. 1, C4) where the expected **k'a-k'a** spelling is deliberately altered (ultimately resulting in a disharmonic spelling as well) to provide the 3SG.ERG to follow.

[78] At least the stem should not be followed by any suffixes. The occurrence of prefixes is unproblematic, as it is only restricted to the ergative pronoun of which the majority is the 3SG.ERG. The preconsonantal **u** < *u–* has no interaction with the root spelling at all, the prevocalic **yV** < *y–* only that it mirrors the initial root vowel. The remaining cases (Gronemeyer 2011b) behave in a similar way, as the prevocalic 2SG.ERG *aw–* < **a-wV** / # __V.

[79] In this sense, other phonemically 'defective' examples are included as well, like the spellings **u=K'UH-ju=lu** < *k'uh-ul* (YAX Lnt. 25, E1, as scheme 1.e.iii) or **IL=NAH** < *il-n-aj* (MQL St. 3, G3b, as scheme 1.f.iv) as testimo-

terns are regarded as universal for any kind of spelling variation and are independent from the underlying morphosyntax. Each of the groups is exemplified by epigraphic records, with generic subgroups[80], identified by number-letter combinations as a distinguishing mark for the analysis.

Most importantly, the samples from the database are classified as belonging to a certain spelling group/scheme by their chosen showcase suffix *only*. The test groups (and respective control groups) were also specifically chosen to minimise the risk of co-occurrence during the analysis and to ensure an unequivocal analysis for one suffix only. For test group 1 (thematic suffix *–aj*), we can account both **tz'i-bi=na=ja** and **²tzu=jo=ma** as samples, the first would classify as being part of spelling group 1 because the suffix occupies the last position and its vowel is provided by the preceding grapheme. The latter is part of spelling group 2, as the suffix is followed by another one, its vowel is syncopated, thus the spelling is non-integrative (although it would be group 1 for the future participle *–om*). In the elaboration and definition of the schemes below, the position and form of the suffix which is relevant for its classification is underlined.

Apparently, the cases chosen for analysis do not necessarily consider all combinations grammatically possible among suffixes and thus reflect the complexity echoed in the hieroglyphic writing. It has been decided to keep the analysis strict and consequent to handle in a first instance. The results and their implications may then be tested against the remainders and more complex examples from the epigraphic record in a second pass.

2.2.2.1 – Group 1: Vowel-Providing Spellings

Vowel-providing are those examples that provide any spelling where the vowel is clearly provided by some grapheme in the sign string of the inflected morpheme. Several subsets can be determined due to the numerous combinatory possibilities. Many spell the root lexeme / stem with the final syllabic sign to mirror the vowel of the following suffix (cases a, b, c, d), especially the cases where the last stem syllabogram also deviates from an unattached root spelling or from spellings with a different suffix vowel (cases b, d). With respect to the assumption of root spellings to generally integrate a vowel at morphemic boundaries, this group can also be called affirmative. Another large group are those spellings with a simple morphographic root, but where the vowel is provided by any kind of overspelling in the suffix domain (case e). These are rather non-integrative as far as the root spelling is concerned, but

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nies of the fading contrast between [h] and [x] in the Late Classic (Grube 2004d: 79-81). Otherwise, these examples serve perfectly well to indicate the suffix vowel by their integrative spelling and are otherwise unproblematic in terms of their suffix function.

[80] The general scheme is a **CV-CV=CV / CVC=CV / CV-CV=V-CV / CVC=V-CV** pattern, but polysyllabic alterations of the root in the case of **CV-CV-CV / CVCVC** are likewise mirrored, also compounds like **CV-CV-CVC** or chains of suffixes. These general spelling schemes are further subdivided to cover cases of syn- and disharmonic realisations. This especially concerns the alterations of root spellings upon suffixation and their impact on the applicability of the harmony rules as well as vowel contrasts in the suffix domain. Non-CVC roots are no concern for special schemes, as only the last two syllabic signs are affected in terms of harmony rules (see Chapter 1.2.2.1, Table 3) and alterations to enable integrative spellings. These cases will be quantified in the analysis to discuss their implications.

the suffix vowel is nevertheless clearly indicated. This also concerns any configuration of *√-C-VC* suffixes (case f) which necessarily need to be non-integrative (group 2) at the *√-C* border, but show integration at the *C-VC* border. Underspelled suffixes (case g) might still provide the suffix vowel by the root spelling. The following schemes (Figure 6) adhere to spelling group 1:

(a) Root synharmonic, spelling retained, suffix = √-$\underline{V_1C}$

(i) $\mathbf{CV_1\text{-}CV_1{=}CV_1 \ / \ CV_1C\text{-}CV_1{=}CV_1}$

e.g. **jo-lo=wo** < *jol-ow* (√ = **jo-lo**), CML U. 26, Pdt. 10, A7

(ii) $\mathbf{CV_1\text{-}CV_1{=}CV_2 \ / \ CV_1C\text{-}CV_1{=}CV_2}$

e.g. **u=chu-ku=wa** < *u-chuk-u(w)* (√ = **chu-ku**), TAM HS. 1, Step III, A2

(b) Root synharmonic, spelling altered, suffix = √-$\underline{V_2C}$

(i) $\mathbf{CV_1\text{-}CV_2{=}CV_2 \ / \ CV_1C\text{-}CV_2{=}CV_2}$

e.g. **chu-ka=ja** < *chu<h>k-aj* (√ = **chu-ku**), TRT Mon. 8, B52a

(ii) $\mathbf{CV_1\text{-}CV_2{=}CV_3 \ / \ CV_1C\text{-}CV_2{=}CV_3}$

e.g. **u=tz'i-ba=li** < *u-tz'i[h]b-al* (√ = **tz'i-bi**), K5022, A2

(c) Root disharmonic, spelling retained, suffix = √-$\underline{V_2C}$

(i) $\mathbf{CV_1\text{-}CV_2{=}CV_2 \ / \ CV_1C\text{-}CV_2{=}CV_2}$

e.g. **u=LAKAM-TUN-ni=li** < *u-lakam-tun-il* (√ = $\mathbf{TUN^{ni}}$), TIK St. 12, D3

(ii) $\mathbf{CV_1\text{-}CV_2{=}CV_3 \ / \ CV_1C\text{-}CV_2{=}CV_3}$

e.g. **u=TUN-ni=le** < *u-tun-il* (√ = $\mathbf{TUN^{ni}}$), ITZ St. 12, D1[81]

(d) Root disharmonic, spelling altered, suffix = √-$\underline{V_3C}$

(i) $\mathbf{CV_1\text{-}CV_3{=}CV_3 \ / \ CV_1C\text{-}CV_3{=}CV_3}$

e.g. **u=ba-ke=le** < *u-bak-el* (√ = **ba-ki**), YAX Bur. 2 Msc. 85, A1-A2

(ii) $\mathbf{CV_1\text{-}CV_3{=}CV_4 \ / \ CV_1C\text{-}CV_3{=}CV_4}$

e.g. **ti BAK-ke=la** < *ti bak-el* (√ = $\mathbf{BAK^{ki}}$), CML U. 26, Pdt. 15, B1

(e) Root syn-/disharmonic, spelling retained/altered, suffix = √-$\underline{V_2C}$ by {**V-CV**, **CV-CV**, **(C)VC**}

(i) $\mathbf{\surd{=}V_2\text{-}CV_2}$

e.g. **IX BAK=e-le** < *ix bak-el* (√ = **BAK**), XLM Jmb. 8, pA2-pA3

(ii) $\mathbf{\surd{=}V_2\text{-}CV_3}$

e.g. **ha=o-ba** < *ha['']-ob* (√ = **ha[']**), PAL T21BT, J'-K'

(iii) $\mathbf{\surd{=}CV_2\text{-}CV}$

e.g. **u=tz'i-bi=ba-li** < *u-tz'i[h]b-al* (√ = **tz'i-bi**), K2573, H1-I1[82]

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[81] Mora-Marín (2005b: 16) however analyses this form as a Yukatekan vernacular to spell the topical enclitic *=e[']*. The choice for **le** instead of the more common **li** in this instance then is clearly triggered by a full phonemic spelling. Similar examples (Lacadena and Wichmann 2002: 287-288, tab. 2) come from the Yucatan peninsula, also e.g. with **yu=xu-lu=le** on K8071, Q1 (Graña-Behrens 2002: pl. 196), dating to 9.16.14.0.0.

[82] This is a secure example where the morphemic boundary is overspelled by the provision of two syllabograms reflecting the root coda, with the first (**bi**) exclusively for the spelling of the root, the second (**ba**) to provide the vowel of the following suffix. There is no evidence for a transliteration ***u-tz'i[h]b-b-al* or ***u-tz'i[h]b-bal*, as no syncopated typical *–b* suffix would morphosyntactically function in this case, nor is any

(iv) √=**CVC**

e.g. **K'UH=HUL** < *k'uh-ul* (√ = **K'UH**), SBL St. 8, A5a

(f) Root syn-/disharmonic, spelling retained/altered, suffix = *√-C-$\underline{V_2C}$* by {**CV**, **CV-CV**, **CVC**}

(i) √=**CV$_2$**

e.g. **u=tz'i-ba=na** < *u-tz'i[h]b-n-a[j-al]* (√ = **tz'i-ba**), K1256, D1-F1

(ii) √=**CV$_2$-CV$_2$**

e.g. **tz'i-bi=na=ja** < *tz'i[h]b-n-aj* (√ = **tz'i-ba**), K1355, B1-C1[83]

(iii) √=**CV$_2$-CV$_3$**

e.g. **u=ti-mi=je=la** < *u-tim-(i)j-e(')l* (√ = **ti-mi**), PAL TI-W, B11-A12

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suffix **–*bal* known (Ch'olan has a –*b-il* perfect participle, though [Bricker 1986: tabs. 14, 15]). Yukatekan features –*(a)b* as the passive derivational suffix (Bricker 1986: tab. 11), but this possibility can surely be discarded for non-CVC transitives which require a 'transitional' –*t*– before (cf. MOP [Schumann Gálvez 1997: 148], YUK [Smailus 1989: 55]), thus the correct Yukatekan derivation would be **tz'i[h]b-t-ab-al*. The sample comes from an *Ik'* site ceramic (Reents-Budet et al. 2007, Velásquez García 2009a). A Ch'olan morphology is to be expected in Motul de San José during the reign of *Tayel Chan K'inich* mentioned in the text (ruled ca. 711-734 AD, Alexandre Tokovinine, written communication, May 21, 2011), although nowadays ITZ and MOP cover the vicinity of this Classic centre. Cases like **u=K'UH-ju=lu** < *k'uh-ul* (YAX Lnt. 25, E1) mentioned above or **u=JOL^{lo}=li** < *u-jol-[i]l* (COL Shl. Taylor Limpet, E1) are also kind of an overspelling, but different. In the first case, one would classify as 1.a.i with the syllabogram more for providing the suffix vowel, the latter accords a 2.a.i scheme, with the syllabogram more to function as a phonemic complement. More opaque are two analogous spellings pointed out by Lacadena (2004b: fn. 101). While **chu-ku-ka=ja** (e.g. YAX HS. 3, Step I Tread, C6) and **tz'a-pa=pa=ja** (CPN St. B, B1) could be considered as root harmonic overspellings, it is equally likely that they can be analysed as ***chuk-k-aj* and *tz'ap-p-aj* respectively, reflecting the CHN –*k-i* passive (Smailus 1975: 194-195) and CHR –*p-aj* (Fought 1967: 201) mediopassive derivation (the latter also supported by the provenance of the sample). This would make the two examples scheme 1.f.ii spellings for the thematic suffix, but a discussion takes place in Chapter 4.1.1. It is interesting that the word *k'a'*, "to diminish" which is attested with the –*V_1y* suffix in glyphic expressions (cf. Kettunen 2005) appears with –*p-a* in modern CHR (Hull 2003: 512). But no ****K'A'=pa(=ja)** spelling for instance is known from an Eastern Ch'olan context to support the existence of this vernacular in Classic Mayan. In fact, MacLeod (Schele and Looper 1996: 41) prove the reading of BM2 by a substitution **k'a-a=yi** < *k'a'-ay-i* on CPN HS. 1 XLI, D1. However, the case of **tz'a-pa=pa=ja** finds support by an eroded spelling that appears to be **cho-ko=pa** < *chok-p-a[j]* on QRG Zoo. G, N'4a.

[83] I follow Lacadena (2004b: 181-182) in considering two typical spellings, a synharmonic **tz'i-bi** for the nominal root *tz'i[h]b* (e.g. K2295, K1-K2) and disharmonic **tz'i-ba** for the transitive verbal derivation *tz'i[h]b-a*, where the –*a* is used as a 'factive' suffix (MacLeod 2004: 311): "to do writing" > "to write" (cf. pCh *–*ä* [Kaufman and Norman 1984: 145]). The Ch'olan –*a* would act identical to the Yukatekan –*t* mentioned above (Lacadena 2004b: 181). A spelling like **tz'i-ba** would classify as scheme 1.g.i for non-CVC transitives, as it omits **=wa** otherwise regularly used with transitive verbs. Nevertheless, this still requires testing in the analysis. In the case of **tz'i-bi=na=ja** (from a data base of 774 entries [Mora-Marín 2004c] **ba** is only known in the example for case 1.f.i, but a few more are found in the corpus), one can assume the shift to a synharmonic root spelling due to a –*C*– suffix to follow the root, as proposed by Mora-Marín (2003a: 27, 29). As the linguistic evidence suggests (Lacadena 2004b: 183-185), the factive –*a* gets elided during passivation, otherwise **(u=)tz'i-ba=na=ja(=lV)** < ***(u-)tz'i[h]b-a-n-aj(-al)* would be expected more regularly in writing. For the same reason, the synharmonic spelling in these instances is also likely not to express the Ch'olan –*i* 'usative/applicative' suffix (MacLeod 2004: 311). Consequently, the abundant **u=tz'i-ba=lV** PSS spellings (Grube 1991: 225-229, MacLeod 1990: 170-174) transcribe as *u-tz'i[h]b-al* (3SG.ERG-writing-ABSTR) and belong to scheme 1.b.i, as they base on the synharmonic nominal root. For that reason, case 1.e.iii features the overspelling to indicate both the proper reading for the root and the suffix. But having said that, at least one interesting case from CHT needs to be pointed out (Sattler 2004: 384): the formation of instrumentals out of verbalised nouns. As expected, Morán (1685-95: 38) provides <*tziba*> as "escribir", but the instrumental as <*tzibaib*>. It can be analysed as **tz'i[h]b-a[h]-ib*, 'writing-ANTIP-INSTR' (Wichmann 2002a: tab. 1), probably of an underlying form ***tz'i[h]b-a-ib*, see footnote 402 for further discussion. It is unclear from Morán whether the occasional retention of a –*V_1* derivational morpheme before another –*VC* suffix was restricted to the instrumental, or if other verbalised noun derivations appear with the same kind of pattern. However, this behaviour needs to be considered for the analysis of test group 3 spellings.

(iv) √=**CV$_2$C**

e.g. **IL=NAH** < *il-n-aj, h ~ j* (√ = **IL**), MQL St. 3, G3b

(g) Root syn-/disharmonic, spelling retained/altered, suffix = *√-<u>V(C)</u>* by **Ø**

(i) √ / √=**V**

e.g. **u-to** < *u[h]t-o[m]* (√ = **u-ti**), CPN St. A, E11[84]

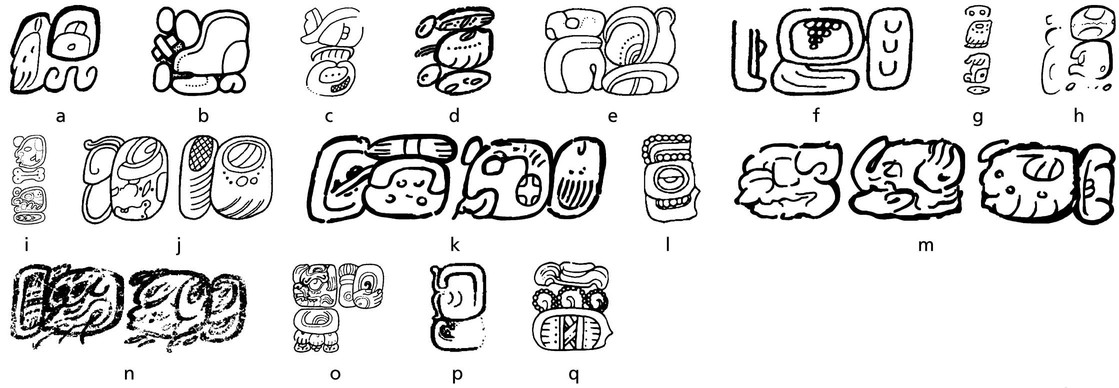

Figure 6: Hieroglyphic examples of spelling group 1 (vowel-providing spellings). **a)** 1.a.i, **b)** 1.a.ii, **c)** 1.b.i, **d)** 1.b.ii, **e)** 1.c.i, **f)** 1.c.ii, **g)** 1.d.i, **h)** 1.d.ii, **i)** 1.e.i, **j)** 1.e.ii, **k)** 1.e.iii, **l)** 1.e.iv, **m)** 1.f.i, **n)** 1.f.ii, **o)** 1.f.iii, **p)** 1.f.iv, **q)** 1.g.i. Sven Gronemeyer, after various artists.

2.2.2.2 – Group 2: Vowel-Suggesting Spellings

Vowel-indicating (or non-integrative or non-affirmative) are the spellings that do not show a change of the final root syllabogram to spell the following initial suffix vowel[85] (cases a, b, c, d). The

[84] This is an example of underspelling easy to classify, as the context refers to a future date and the following verb is also affixed with the future participle (cf. **TZUTZ=jo=ma**, CPN St. A, D12), thus a mere root spelling instead of the regular **u-ti** can be excluded. As Zender (1999: 137-142) has shown, [m] is among the phonemes to be frequently omitted in word-final position, but the shifting spelling to **u-to** ensures (1) the provision of the suffix vowel and (2) points out the underlying linguistic form and grammatical function. The recognition of underspelled phonemes becomes more difficult in a chain of morphemes, and the work flow for the sample collection must be executed very carefully or fuller spellings need to be consulted (e.g. the frequent omission of {**la**, **li**} / __# among emblem glyphs and toponyms to indicate a locative suffix), especially in nominal phrases or formulaic expressions with a tendency to underspell (cf. Wald 2007: 115-124). These underspellings also provide an excellent case to investigate the consonants omitted and compare with Zender's findings. More ambiguous are those instances where the zero grapheme might not be a simple underspelling, but the reflection of a sound or spelling change. The spelling of **chu-ka** < *chu<h>k-a[j]* (YAX Lnt. 16, A2) is seen as a mere underspelling, but **chu-ka** on CNH P. 1, A3 may represent *chu<h>k-a*, as well as **jo-ch'a** on ITN St. 17, K2 as *jo<h>ch'-a*. Lacadena (2004b: 192) proposes the last two examples to appear in an Eastern Ch'olan vernacular context by the end of the Late Classic (although ITN St. 17 may also contain Western Ch'olan features [Mora-Marín 2007]). A loss of the final /j/ may therefore have appeared among the passive thematic suffix. This proposal however requires more analytical confirmation. In any case, the alteration from a synharmonic to a disharmonic spelling and the syntactic embedding ensures the identification of a passive form. The same scheme also applies for any other *–V* only suffix (see footnotes 290 and 315 and Table 40), as e.g. with **u=CHOK^{ko}** on CPN T. 22 Stone, E4. Another special challenge are those remaining cases where it is not clear whether a suffix is to follow or not, these are consequently treated as 4.a.ii and 4.a.iii case (see corresponding footnotes).

[85] Houston, Robertson and Stuart (2001b: 23) termed these instances "aberrant spellings", as they exhibit not "the more usual pattern of vowel harmony in the second syllable." They further consider that these spellings "may simply be indicating the sign-class boundary between syllabic signs […] and their morphosyllabic companion […]." I second this statement when I interpret it in a way that morphemic boundaries are indicated (similar to the cases of synharmonic roots to likely indicate syncopation) and view the spelling from a morphosyntactic perspective. But I do not concur with the authors' original, graphematic argumentation (Gronemeyer 2011b: fn.

root is mostly spelled as if unattached and if not by chance the vowel of the suffix is the same as the one provided by the final root grapheme (thus effectively being part of group 1), it requires reconstruction. However, there is the assumption to be tested in the analyses that in these cases the syllabic sign indicating the suffix points out the correct vowel by the one remaining mute[86]. Still, the spelling would require reconstruction, but less from linguistics than by orthography[87]. A special case hereof are roots simply realised by a morphograph[88] (case e, together with group 3). There are those non-integrative spellings in which the suffix vowel is syncopated at the *√-C* border of any *√-C-V(C)* word shape (case f) and finally those with an underspelled root (case g). The schemes (Figure 7) are partly an inversion of group 1, but only as a subset, as all other combinations would again adhere to group 1:

20). If morphosyllables are a constituent sign class in Maya writing, their properties would not require spellings to alternate towards a full phonemic integration, as it is apparently done in the majority of cases. The phonemics would be inherent in a morphosyllable, as evoked by Robertson (2004b: 32-33) and fellow authors (Robertson et al. 2007: 18), a "reader must 'fill in the gap', much like an English speaker 'knows' that the /s/ of *dogs* is really pronounced as a [z], while the /s/ of *docks* is pronounced as an [s]." Unfortunately, Maya hieroglyphic writing is entirely different to an alphabetic writing system in general and English phonotactics in particular. Allophonic sound variation induced by morphophonemics is likely – but the sound value of the syllabogram itself does not alter, it is a supragraphematic change. Furthermore, a morphosyllable, as defined by its principles (Houston, Robertson and Stuart 2001b: 15) and its later theoretical outline (Robertson et al. 2007: 4), cannot spell a syncopated suffix when it is supposed to indicate a vowel to be filled in by the reader or invert their phonemic structure?

[86] This statement requires a strict definitory separation: by no means the mute vowel of the grapheme provides the suffix vowel on a phonemic level, as this would be a principle of the morphosyllabic definition (Houston, Robertson and Stuart 2001b: 15). It is only meant on a graphematic and visual layer, as a form of reading aid (cf. Gronemeyer 2011b: fn. 20, also Tokovinine and Davletshin 2001).

[87] Also to be verified in the analyses is the assumption that non-integrative spellings are restricted to cases where the syllabogram vowel not only indicates the suffix vowel but also where the vowel is fixed, like with the thematic passive suffix. Root-vowel reflecting suffixes would also count to this group, as the rare mediopassive spelling **T'AB=ya** < *t'ab-[a]y* (e.g. CAY Lnt. 1, C12) as a 2.e.i case indicates, but more importantly the abundant **T'AB=yi** < *t'ab-[a]y-i* (e.g. CPN Alt. Q, F1) spelling as a 2.e.ii case. Clearly, there might be some spelling deviations (cf. Gronemeyer [2006b: 28] for a discussion of the reading of the example of case 2.e.ii) possible, as the vowel is known (cf. Stuart and Houston [1994: 44, fig. 51] for complementation patterns of the grapheme XGK).

[88] Harmony rules do not need to be considered, and this group so to say reflects the most economic way to represent a non-integrative spelling. This may eventually be an explanation why this group represents by far the largest quantities in the epigraphic record among the non-integrative examples. Without any orthographical redundancy, the visual 'reading aid' for the suffix is even more important than in syllabic root spellings. As Mora-Marín (2003a, 2004a, 2010a) already pointed out, conventionalised spellings need to be in place, otherwise the reader may get confused as the expectation from linguistic knowledge is not met by orthography. – As syllabic spellings were not overly common when the writing system developed and still by the Early Classic (Grube 1990a: 48, Justeson 1986: 452-453), such conventionalised spellings were needed among morphographic roots that were not backed by phonemic complements. Grube (1990a: 47-48, 50, 80) considers the prevocalic 3SG.ERG *y–* < **yV** (integrative!) stipulated the development of syllabic signs. When the use of syllabic spellings increased (Grube 1990a: 44-46, tab. 1, Houston 1988: 130, Justeson 1989: 29), integrative spellings almost automatically might have emerged as a scribal 'best practice'. The conventionalised spellings from the times when they were a necessity were retained because of historical reasons, but also for continuity, as morpho-syllabic systems tend be conservative (Gelb 1952: 202-203, Goody 1987: 27-38). Consequently, integrative spellings should accumulate over time together with spelling variations becoming more abundant. See the 1.b.ii instances of **yu=k'i=ba** < *y-uk'-ib* (e.g. K1303, I1), where the common **bi** to graphematically point out the instrumental is replaced by a different **bV** sign. Apparently, only at later developmental stages, spellings tend to vary and phonemic values for a grapheme to alter and increase (cf. Fairman [1945: 55-57] for Ptolemaic writing). The data should specifically be scanned for such samples and the analysis focus on these developments. Eventually, Grube's (1990a: 80) proposal of a "proto-syllabary" and its necessity to indicate grammatical functions could be clarified, although a backward extrapolation of the sign inventory should be approached with caution (Wichmann and Davletshin 2006: 105).

(a) Root synharmonic, spelling retained, fixed suffix = √-*V$_2$C*

(i) **CV$_1$-CV$_1$=CV$_2$ / CV$_1$C-CV$_1$=CV$_2$**

e.g. **chu-ku=ja** < *chu<h>k-[a]j* (√ = **chu-ku**), COL P. Kimbell, A2

(b) Root synharmonic, spelling altered, fixed suffix = √-*V$_1$C*

(i) **CV$_1$-CV$_2$=CV$_1$ / CV$_1$C-CV$_2$=CV$_1$**

e.g. **tz'a-pu=ja** < *tz'a<h>p-[a]j* (√ = **tz'a-pa**), TIK St. 31, O1

(c) Root disharmonic, spelling retained, fixed suffix = –*V$_3$C*

(i) **CV$_1$-CV$_2$=CV$_3$ / CV$_1$C-CV$_2$=CV$_2$**

e.g. **BAH^{hi}=ja** < *bah-[a]j* (√ = **BAH^{hi}**), TAM HS. 3 III, E1

(d) Root disharmonic, spelling altered, fixed suffix = √-*V$_2$C*

(i) **CV$_1$-CV$_1$=CV$_2$ / CV$_1$C-CV$_2$=CV$_2$**

e.g. **u=tz'i-bi=li** < *u-tz'i[h]b-[a]l* (√ = **tz'i-ba**), K5635, B1-D1

(e) Root syn-/disharmonic, spelling morphographic, fixed suffix = √-*V$_1$C* by **CV**

(i) √=**CV$_1$**

e.g. **u=BAK=le** < *u-bak-[e]l* (√ = **BAK**), CML U. 26, Sp. 6, A5

(ii) √=**CV$_2$**

e.g. **^{mu}MUY=li** < *muy-[a]l* (√ = **MUY**), COL Vessel (Coe 1973: 113)

(f) Root syn-/disharmonic, spelling retained/altered, suffix = √-*C*-*V$_2$(C)* by {**CV**, **CV-CV**}

(i) √=**CV$_2$**

e.g. **pa-ka=xi** < *pak-x-i* (√ = **pa-ka**), NTN Dwg. 48, A1[89]

(ii) √=**CV$_2$-CV**

e.g. **chu-ku=ji=ya** < *chu<Ø>k-j=iy* (√ = **chu-ku**), CNK Trn. 1, K1

(g) Root syn-/disharmonic, spelling retained/altered/underspelled, suffix = √-*V(C)* by {**CV**, **Ø**}

(i) **CV=CV$_2$**

e.g. **chu=ja** < *chu<h>[k-a]j* (√ = **chu-ku**), K2352, S3-S4

(ii) √

e.g. **u=KAB=ya** < *u-kab-[ij]=[i]y* (√ = **KAB**), ALC St. 1, B7

[89] Kaufman and Norman (1984: 104) provide the linguistic evidence for this form (see footnote 127) with the completive status marker and a thematic to follow (hence **xi**). However, we also have **pa-ka=xa** (e.g. NTN Dwg. 65, B2) that points to the form *pak-x-a-Ø* or possibly *pak-ax-Ø* (see footnote 148).

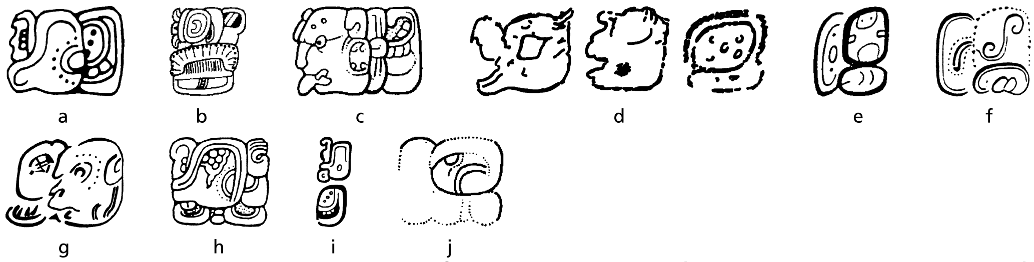

Figure 7: Hieroglyphic examples of spelling group 2 (vowel-suggesting spellings). **a)** 2.a.i, **b)** 2.b.i, **c)** 2.c.i, **d)** 2.d.i, **e)** 2.e.i, **f)** 2.e.ii, **g)** 2.f.i, **h)** 2.f.ii, **i)** 2.g.i, **j)** 2.g.ii. Sven Gronemeyer, after various artists.

2.2.2.3 – Group 3: Ambivalent Spellings

Ambivalent are spellings with a purely morphographic realisation of the root to be distinguished as a special case of the vowel-suggesting spelling cases 2.e.i and 2.e.ii above, these being restricted to predictable vowel suffixes. The ambivalent cases here are graphematically the same (Figure 8), but their suffix vowel is – at least epigraphically – undetermined and eventually requires reconstruction by full syllabic substitutions or complemented spellings. The supposed vowel indication by the syllabogram indicating the suffix might be given, as in case 3.a.i, but is not necessary, as case 3.a.ii shows.

(a) Root syn-/disharmonic, spelling morphographic, variable suffix = $\sqrt{}$-$\underline{V_1C}$ by **CV**

(i) √=$\mathbf{CV_1}$

e.g. **yu=UK’=bi** < *y-uk’-[i]b* (√ = **UK’**), K635, E1

(ii) √=$\mathbf{CV_2}$

e.g. **TAN HA’ BAK=la** < *ta[h]n ha’ bak-[i]l* (√ = **BAK**), TRT Mon. 6, J2[90]

Figure 8: Hieroglyphic examples of spelling group 3 (ambivalent spellings). **a)** 3.a.i, **b)** 3.a.ii. Sven Gronemeyer, after various artists.

[90] As Lacadena and Wichmann (2005b: 27) rightly emphasise, it is not possible to determine the suffix vowel, but they narrow it down to *–VVl* or *–V’Vl* (Lacadena and Wichmann 2005b: 16-19, 21-28) by epigraphic evidence and further commit themselves to *–iil* by linguistic indications. For case 3.a.ii, it is suggestive that **la** (among other cases) at least functions as a visual or graphemic pointer for a locative suffix function. In that sense, these syllabograms would provide a graphematic function also attributed to morphosyllables (Houston, Robertson and Stuart 2001b: 15, Robertson et al. 2007: 3-4), but without becoming morphographic. The morphosyllabic approach often misses a proper separation between the grammatological and linguistic levels involved in writing. If not utilised for the vowel indication, there might at least be a functional explanation for these spellings instead. This also seems to be true for **yi** as a 2.e.i or 2.e.ii case spelling for the mediopassive. Another possibility why in the case of the Palenque toponym and emblem glyph it has to be *–il* is the otherwise steady phonemic complementation with **ki**, although no example of **BAK-ki=la** or **ba-ki=la** is known to support this idea. The same may be true for the Tikal emblem and toponym **MUT=la** < *mut-[u]l* (e.g. TIK Hombre, F6a) by its otherwise attested complementation with **tu** (e.g. YAX Lnt. 17, F1).The hypothesis that in the case of variable vowel suffixes the vowel of the second root syllable may be an indicator instead of (or additional to) the vowel indicating the suffix should be kept in mind and tested.

2.2.2.4 – Group 4: Doubtful Spellings

Doubtful are the spellings that do not match any of the schemes above. This is predominantly for those cases where the morphological segmentation yields a number of possibilities or underspellings leave room for the existence of a suffix. After analysis, samples from this group may end up to be re-classified to one of the other groups, as some of the examples show clear vowel integration. The following, very generally outlined, schemes are counted to this group, each provided with some background of why the spelling (Figure 9) is doubtful:

(a) Doubtful cases left for discussion

(i) Full spellings of doubtful identification/segmentation
e.g. **wa-WE'-la** < *wa['] we'-[e(')]l* ? (√ = **WE'**), PAL K'TOK, pBp7[91]

(ii) Underspellings of potentially determined suffix
e.g. **STAR.WAR** < *STAR.WAR[-V₁y]* ? (√ = ?), TRT Mon. 8, B59a[92]

(iii) Underspellings of undetermined suffix
e.g. **chu** < *chu<h>[k-aj]* ? (√ = **chu-ku**), K2352, W2[93]

(iv) Underspellings of doubtful suffix
e.g. **te-mu** < *te'm-u[l]* ? (√ = **te-mu** ?), PNG St. 3, E3b[94]

[91] Lacadena and Wichmann (2004: 114) analyse **WE'-la** in accordance with their harmony rules as *we'el*, "food" which in a first instance leaves the **wa** in the present example unexplained. A noun derived by the control group 3 *–el* nominaliser from an intransitive is very viable within the title initiated by *K'an Tok* (also compare to *K'an Tok Wayab* as the title of a *sajal* captured by *Yaxun Bahlam* IV, e.g. YAX Lnt. 8, D1-D2). Barbara MacLeod (written communication, October 17, 2011) suggested a cognate to CHR *we'er*, "meat" and *we'erar*, "any fleshy part of the body" (Wisdom 1950: 755), possibly with an underlying and underspelled *we'-el[-Vl]*. The **wa** sign was interpreted as an abbreviated form for the positional *wa'* by her. Kerry Hull (written communication, October 18, 2011) supported this view in that CHR can have *wa'* as a preposed attributive in the context *wa' te' k'ur winik*, "the man with an erection". He drew a parallel to CHR *we'ri*, "incarnate" for **WE'-la** < *we'lV*, but a nominal meaning is much more likely, and eventually "meat" and "food" might derive from the verbal *we'*, "to eat", as such it would be a scheme 2.e.ii spelling. The example from PAL K'TOK was then jointly interpreted as a metaphor for "erection" and connected to some possible penis bloodletting function (Gronemeyer 2003: 9-10) of the personages mentioned in the inscription carrying this title (possibly in connection to a priestly position [Stuart 2005b: fn. 12]). Another tentative segmentation could assume a lexical unattested root **waw* and the control group 3 suffix *–e'l*, thus the **WE'** sign would overspell the morphemic boundary by providing the root coda and the complex vowel of the suffix. As **waw* cannot semantically be determined and thus no part-of-speech attribution is possible, this segmentation has to remain doubtful as well.

[92] These are examples of the 'Earth Star' variant (Closs 1979: 148-149) for which an underspelling may be assumed, as **STAR.WAR=yi** spellings (e.g. TRT Mon. 6, G4) demonstrate. Further support is supplied when paralleling them with the 'Shell Star' variant that provides **yi** for the mediopassive suffix. Still, little is known about the morphology of the enigmatic 'star war' expression. However, an object-incorporating 'antipassive' by –Ø (see Chapter 3.1.3.2) is more secure. It would make the 4.a.ii attribution for the 'Star War' glyph obsolete.

[93] Boot (2009b: 55) reconstructs as a passive form, probably based on comparison with other defective spellings like **chu-ka** (as a case 1.g.i case) and **chu=ja** (as the 2.g.i example from the same text). Further supports comes by the following *u-bak k'an* (providing "it was captured the captive of *K'an*"), which can be paralleled to **chu=ja u=BAK**[ki] < *chu<h>[k-a]j-Ø u-bak* (K2206, U1-W1) from the same 'Fenton' scribal school (de Castro 2005). Other alternatives are a nominal spelling **chu[k]-Ø-Ø* ("it is a capture, he is the captive of *K'an*") or an antipassive **chu[k-uw]-Ø* ("he captured, he is the captive of *K'an*").

[94] The spellings involving an *e-u* contrast are an epigraphic conundrum. Lacadena and Wichmann (2004: 116-119) consider this example and also **e-bu** (e.g. NAR HS. 1, Step II, P2a), **ye=bu** (e.g. NAR HS. 1, Step IV, W1) and **che-bu** (e.g. K4022, A3) as underspellings of an **–ul* suffix. There are more aspects to consider that cloud that obvious assumption. Besides these spellings we also have **te-ma** (PAL HCPC, E1), but also **ye=ba** (e.g. DPL HS. 4, Step II, K2) and also **che-ba** (e.g. TRT Mon. 6, pS1). As per Lacadena's and Wichmann's harmony rule 3b *e-a* shall indicate *Ce'C*, the spelling **che-e-bu** (K7768) has been taken as an argument that *e-u* may be equivalent

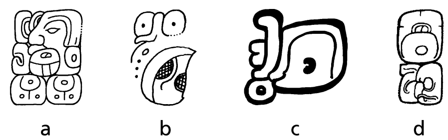

Figure 9: Hieroglyphic examples of spelling group 4 (doubtful spellings). **a)** 4.a.i, **b)** 4.a.ii, **c)** 4.a.iii, **d)** 4.a.iv. Sven Gronemeyer, after various artists.

2.2.2.5 – Procedural Implications of the Spelling Classification

While during the data base compilation the showcase and the spelling scheme attribution remain disjunct as linguistic and graphematic determinants, the morphological segmentation still has serious impact, as some of the annotations to schemes demonstrate. Cases like **chu-ku-ka=ja** or possibly **chu-ku=ka=ja** may result in diverging spelling schemes (1.e.iii or 1.f.ii), depending on their segmentation as either *chu<h>k-aj* or *chuk-k-aj*, while they remain both 1PASS cases. While the lexeme remains the same here, there is slightly greater impact among **na-wa=ja**. While the thesis follows the traditional approach to segment and translate as *na<h>w-aj*, "it was revealed", there is an alternate view for *na[']-w-aj*, "it was made known" (cf. Bíró 2011b: fn. 2, Guenter 2007: fn. 21) [95]. Both segmentations would linguistically and semantically be viable.

But unlike a scheme 4.a.i case, we still can identify the 1PASS case *–aj* thematic, the only question would depend on the classification as a 1.a.i or a 1.f.ii scheme. The decision for a segmentation and thus a scheme attribution has necessarily to take place upon the data entry. Revisions are possible to a certain extent and point in the analytical flow. But even after the presentation of a final result, new evidence will likely have limited impact. With a high probability, spellings will stay in the same group at least when the segmentation changes, only few cases would result in changing the analytical group.

One example is a parallel to the still poorly understood 'intransitive compounds' (Grube 2004d: 74-75). These 'transitive compounds' consist of a transitive and a substantival root and can be suffixed with a **ja** sign[96], specifically among the 'object-binding' expressions, e.g. **K'AL=BIX=ja** (TRT Mon. 8,

to *e-a* in indicating a glottalised root vowel. Yet, the variations would not support the underspelled suffix **–u[l]*, but rather **–V[l]* or **–[ul]*. In this sense, Robertson, Houston, Zender and Stuart (2007: 29) just refer to "interesting shifts in spelling" by considering *e-u* as a later development out of *e-a*, without going into the details of the implications. Furthermore, they consider *e-a* to indicate *CeeC* rather (2007: 10), but at the same time contradict themselves by stating that "VV cannot be spelled with disharmonic /*Cu*/". As the **–u[l] ~ *–V[l]* suffix has not yet been functionally described for Classic Mayan, its presence (and underspelling) remains doubtful and may just be the reflex of poorly understood harmony rules (cf. Gronemeyer [2013: fn. 24] for a similar case).

[95] Refer to footnote 15 and the case of **NAH-wa=ja** < *na<h>w-aj* (PAL T18S, A5) which I take as a strong indicator for the passive <*h*> infix, because its preponderant use is morphographic and here even phonographic. From the same inscription comes from **MO' NAH-bi** < *mo' nahb* (PAL T18S, I6, H6), reflecting the pCh aspirated vowel in **nahb* (Kaufman and Norman 1984: 126). However, we know from other inscriptions that the sign 1G2 is used as the syllabogram **na** (Grube 1990a: 73) from around 9.11 on, e.g. **u=tz'i-bi=na=ja=la** < *u-tz'i[h]b-n-aj-al* (K2730, C1-D1). Furthermore, if the root would be **na'*, one could to at least expect one spelling ****na**[a]**=wa=ja** to reinforce the root final glottal.

[96] An analogue example from with a **ja** sign from the 'intransitive compounds' would be **OCH-BIH=aj** (e.g. PAL T18S, B7). Based on the understanding of previous research, it would probably be classified as a 4.a.i case. The death expression (Eberl 1999: 21-23) often appears without a suffix (or just a complement **hi**, e.g. K6751, N4) and could be taken as a stative nominal compound, presumably involving the –Ø nominaliser. While Grube (2004d: 74-75) considers the perfect or a temporal enclitic, to me the more manifest explanation for the **ja** sign

A3). The graphematics is often ambiguous to whether **ja** only affects the verbal root, the entire compound, or if it depends from case to case. In the first instance, we would expect a 1PASS case *k'a<h>l-[a]j-Ø bix*, "it was bound the anniversary" (Gronemeyer 2011a: 10), in the second the inchoative of a nominal compound *k'al-Ø+bix-[a]j-Ø*, "it became anniversary-bound" as a 1INCH case[97]. In both cases, the spelling scheme is classified as 2.e.i.

In general, certain spellings may eventually never be resolved with certainty regarding their morphological segmentation from graphematics. This of course may affect certain figures in the analysis, but the impact may be limited due to the number of cases. For the phonological transcription, the affect may equally be small.

Another implication from the spelling scheme definition concerns the statistical methodology. If one looks at the quantity of schemes defined (n = 33), it is apparent that 17 (or 51.5 %) alone form spelling group 1 and that by combinatory logic the number of cases for group 2 has to be lesser. As the schemes are broad enough to describe spellings for any lexeme with any suffixation known for Classic Mayan (or at least for the showcases and analogue *–VC* patterns), samples of any potential lexeme-suffix combination can be expected to follow a discrete probability distribution across the schemes[98]. As integrative, vowel-providing spellings already make the majority of slots to be filled with samples, it can be expected that such spellings will mark the peak in quantity, followed by vowel-suggesting, but non-integrative cases. There are several ramifications to this expected distribution (see Chapter 2.5.3.2), e.g. that certain lexeme-suffix combinations appear more often in the inscriptions. It is supposed that the probability distribution will appear like a normal distribution, although it is determined by discrete categories with disjunct values. The linguistic and graphematic determinants may however produce a certain skewness in the distribution. The probability for a certain form or spelling to appear in writing will be calculated with an inverse binominal distribution (see Chapter 2.5.2).

would be an inchoative *och-Ø+bih-aj-Ø*, "he became road-entering", if VER+NOUN or POS+NOUN can be derived into a nominal compound. Helmke (2012: fn. 12) independently concludes a similar possibility by applying the *–aj* denominalising suffix (Lacadena 2003), but without specifically noting an inchoative derivation. Also see footnotes 333 and 357 for preliminary considerations and Chapter 4.1.3 for a discussion of nominalised compounds. The conditions of their formation is also dependent of the language, Yukatekan (see Chapter 3.1.3.2) for example allows compounds with transitive verbs, seemingly without prior nominalisation, e.g. *k'al+beh*, "road-block, barrier" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 370).

[97] Clear evidence for an inchoative form is **nu-pu=TE'=ja** < *nup-Ø+te'-[a]j-Ø*, "it became staff-joined" on TRT Mon. 6, F10. Here, the **TE'** sign is placed directly before **ja** to indicate a compound. Likewise, an unequivocal passive is **K'AL**$^{\mathrm{la}}$**=ja tu=wo-jo=li** < *k'a<h>l-aj-Ø t-u-woj-[o]l*, "it was recorded in its writing" (YUL Lnt. 2, A3). In fact, the segmentation depends from case to case, and in the Yula example it is evident because of the prepositional phrase.

[98] Therefore the preference of spellings for *chuk*, *bak* and *tz'ihb(a)* to coherently exemplify the schemes and how their different grammatical marking spreads across several schemes.

2.3 – Compilation of the Data Base

AS THE MAIN ANALYTICAL REPOSITORY, the data base has to be designed and set up to contain all epigraphic parameters necessary to purposively support the thesis' aim. These parameters derive from the desiderata identified and objectives formulated. In order to populate the data base with samples for the analytical showcases, a methodology needs to be applied to retrieve them from the epigraphic source materials. Both aspects cannot be viewed entirely separate, but the data base layout will be explained first to define the parameters and afterwards the approach to extract these parameters from a single text of the corpus.

Not necessarily all parameters can be obtained for each sample, as the parameters are each constrained by a number of factors. These can simply be source-related or are conditioned by grammatological premises. These limitations will again have an impact on the analytical workflow and above all the statistical methods and data interpretation. More details are given in Chapter 2.5.3.

2.3.1 – Data Base Layout

2.3.1.1 – Analytical Sample Parameters

Each epigraphic sample suitable to contribute to the analytical aims will be recorded with the following parameters:

(1) *Epigraphic Data*

(a) *Transliteration*: given by a morphologically appropriate ordering and as per step 2 from Chapter 1.2.3. The transliteration is chosen as the primary attribute for two reasons: it does not need to care about allographs or sign positions and as being broad, it does not already anticipate reconstructions as does the narrow transcription, as this is the aim of the analyses. As spelling practices and patterns are to be investigated, the transliteration is the aptest classifier, although being the second analytical step after the classification.

(b) *Classification*: following the sign designations (including variants) by Macri and Looper (2003b) and as per step 1 from Chapter 1.2.3 – as far as possible.

(c) *Transcription*: a narrow transcription and morphological segmentation of the sample as per step 3 from Chapter 1.2.3 – as far as possible. The current research on morphology, as outlined in the test case definitions of Chapter 2.1 and the hypotheses of Chapter 3.1 will be followed here, with subject to revision for the analysis in Chapter 3.3.

(d) *Morphological analysis*: the grammatical description of all morphemes contained in the sample as per step 4 from Chapter 1.2.3 – as far as possible. In the data base, the lexical class of the root[99] is recorded instead of the lexical meaning.

(e) *Syntax*: the syntactic role the sample is playing in the entire clause from which it has been extracted as per step 4 from Chapter 1.2.3 – as far as identifiable.

(f) *Function*: the function of the suffix that was decisive for the sample being added to the data base is again restated for easier analytical group formation and to disambiguate homophonous or other functions, as these may not directly be distinguishable from the lexical class or syntactic role alone, e.g. a form within a nominal phrase.

(g) *Is morphographic*: Boolean value to indicate whether the lexical root of the sample is written by a morphograph or not, regardless of the presence of phonemic complements. This will provide a figure of how favoured morphographs in a spelling (if at all existing) for one lexeme are. A division between the spelling groups would not be able to provide this number, as morphographic spellings may occur in all four of them.

(h) *Spelling*: The spelling classification according to the generalised schemes defined in Chapter 2.2.2.

(2) *Spatial Data*

(a) *Site*: provides, if available, the provenance by the three letter site code (Riese 2004) or other identifiers, otherwise indicates an object of unknown provenance. Together with the monument designation and position it provides a unique identifier for the sample.

(b) *Monument*: the monument designation as per the literature and following the guidelines from Chapter 1.2.3.

(c) *Position*: the position of the sample from the inscription's block matrix.

[99] The actual semantics of the lexical stem is of lesser importance for an orthographic study based on morphological and phonological premises (see Chapter 1.2.1.2 on homophony and polyphony). It is, in a broader sense, a part-of-speech tagging, as the present study also contains aspects of corpus linguistics, but with some major restrictions and alterations. When we speak of a corpus of hieroglyphic inscriptions as per the definition from Chapter 1.2.1.1, it is not necessarily congruent with the definition for corpus linguistics (McEnery and Wilson 2001: 29-32). With respect to the four criteria, we can specify for the Maya corpus: (1) The sampling is not necessarily representative. With all known texts considered, it is a cross section through time, space and genre (and their dependent attributes, e.g. vernaculars, style, scribal competence, etc.), but still with a strong elite focus and limited vocabulary and grammar, (2) the corpus is more or less finite, as only a specific number of inscriptions is archaeologically known. New inscriptions can be added, but not all known texts may be readily available for analysis, (3) the corpus is not available in a machine-readable form that would enable or facilitate part-of-speech tagging, nor is it even readily available in other formats, as (4) there is no standard reference. So far, only part-corpora on specific sites and/or media (see Chapter 1.3) have been compiled in photo and/or line drawing, let alone that an analysable corpus of classified/transliterated/transcribed inscriptions has been established. The data base for the present study is no remedy of the situation, as it is selective by the showcases outlined in Chapter 2.1. An attribution of the stem to a lexical class is hence not made for computational purposes in the thesis, but only to serve the analytical objective: to identify the lexical class of a root/morpheme in order to judge on its syntactic role and to determine the function of its suffixes. However, if at a time a corpus exists that would fulfil the corpus linguistics criteria (McEnery and Wilson 2001: 29-32), Mayan linguistics and epigraphy could very well benefit from automatic tagging (e.g. Dermatas and Kokkinakis 1995), as an approach for Japanese (Papageorgiou 1994) has shown. There is still one major objection against computational analyses of Classic Mayan: the current state of research has still not reached sufficient depth in language description to provide firm parameters for tagging.

(d) *Region*: additionally to the site, a greater geographical region is provided to compare spelling practices among sites of the same region or between regions (see Chapter 2.5.4, Figure 14). In case provenance is unknown, the text was relocated or written by outsiders, the likely original regional attribution by style, internal arguments, etc. is useful to distinguish for spatial distribution analyses that will mostly be handled on this level.

(3) *Temporal Data*

(a) *Contemporary date*: if available, the (reconstructed) Long Count date on which the inscription was commissioned or dedicated to provide the *terminus post quem* of the text and the spellings contained therein.

(b) *Context date*: if available, the (reconstructed) Long Count date on with which the sample is associated in the monument's internal calendrical nexus. The distinction between contemporary and context date is important for three reasons: events future to the relative time setting of the text will be marked by different grammatical affixes, events of the distant past may be spelled by anachronistic graphemes and/or with archaic suffixes (e.g. Gronemeyer 2006b: 151, 173). The distinction between actual dating and the temporal reference is an additional filter for the analysis.

(c) *Period*: the dating by the contemporary date reduced to the *K'atun* to facilitate the formation of analytical groups. Furthermore, if no exact date can be provided, a rough dating (cf. Mathews 1985) can perhaps be included here, e.g. based on iconographic style (e.g. Proskouriakoff 1950), palaeography (e.g. Lacadena 1995) or contextual arguments, such as otherwise known historical persons or events as anchors.

(4) *References*: a source in the literature where either an image of the inscription is given from which the sample can be retrieved or any other citation that includes the sample.

The data base entry of a sample then appears like the example in Table 5. In it, the primary attribute of the transliteration plus the spatial attributes provide the superkey to uniquely define a tuple in the database.

1) Linguistic Data		**2) Spatial Data**		**3) Temporal Data**		**4) References**
a)	**ti JOY-ye=la**	**a)**	YAX	**a)**	9.14.?.13.?	Graham & van Euw
b)	32M(1):ZB1(1)°ZUF(1).MZR(1):AMB(2)	**b)**	Lnt. 26	**b)**	9.14.12.6.12	1979: 57
c)	*ti jo<Ø>y-el-Ø*	**c)**	T1	**c)**	9.14	
d)	PREP VER.TR<PASS>-NMLS-3SG.ABS	**d)**	Usumacinta			
e)	PREP					
f)	3NMLS					
g)	1					
h)	1.b.ii					

Table 5: Model of an epigraphic sample in the data base.

2.3.1.2 – Higher Organisational Levels

For each root morpheme, one table with the parameters outlined above is created to store any sample to match one of the analytical showcases. The analyses can in a first step evaluate spelling patterns among one stem only and compare alterations within one showcase and between them. The conclusions for one lexeme can then be compared with others, thus consecutively building a bigger picture from the more detailed results.

The lemma-organised tables also provide the basis for relational queries that support the analytical objectives and group formation with maximum flexibility. Queries for a specific grammatical function in combination with spatial or temporal data can therefore be made to retrieve separate data sets for specific questions or mappings. Also refer to Chapters 2.4.2 and 2.5.

2.3.2 – Sample Collection

To be able to identify and collect samples suitable for the thesis' purposes and to lay out an analytical scheme as per Chapter 1.2.3, several premises need to be fulfilled. They are usually subsumed under the methodological approach of a source-immanent analysis (Gronemeyer 2006b: 17-19, after Riese 1971: 158-160, 208-209, 210-212). Although the scheme (Figure 10) was developed for an analysis focusing on a history of events, it is still very suitable with a different weighting for some steps.

The segmentation of a text into phrases is important to obtain the context date of a sample and the monument's contemporary date. The decision whether a transliteration of all signs within a hieroglyph is possible concerns the cases of undeciphered lexemes with known semantics[100], e.g. the so-called 'Star War' glyph (Aldana 2005, Riese 1982: 274-278, Schele and Grube 1994a: 18-21, Stone, Reents and Coffman 1985: 273-274). More importantly, the ability to transliterate all (or the remaining) signs initiates the decision tree whether this hieroglyph is a sample for the showcases by morphosyntactically segmenting it and determining the part of speech and function of the affix(es).

Consequently, hieroglyphs that exhibit illegible signs (e.g. by erosion) that can be considered as bound morpheme spellings by formal criteria will be excluded. Reconstructions of effaced spellings are done very carefully and only if enough context is provided to do so – doubtful cases will not be included. It is of course assumed that otherwise the graphemes for the spellings of the showcase suffixes are deciphered. However, rare allographs may sometimes occur in an applicable spelling that has resisted decipherment so far and may cloud its relevance[101].

[100] Samples for which only an interpretation can be given nevertheless can contribute to spelling pattern analyses when a suffix of the showcases is present. Likewise, if only a reading is given and the hieroglyph fulfils a clearly recognisable role in the syntagma (i.e. the function of the suffix is deducible) it will be included in the data base.

[101] See a recent proposal by Albert Davletshin (written communication, June 11, 2011) for a **li** value for the THORAX.INTESTINES sign ZD6 on TIK MT 9, C1 and K8393, G1. The first example may have an impact on control groups 1 or 3, depending on the final analysis (see footnote 734 for the justification).

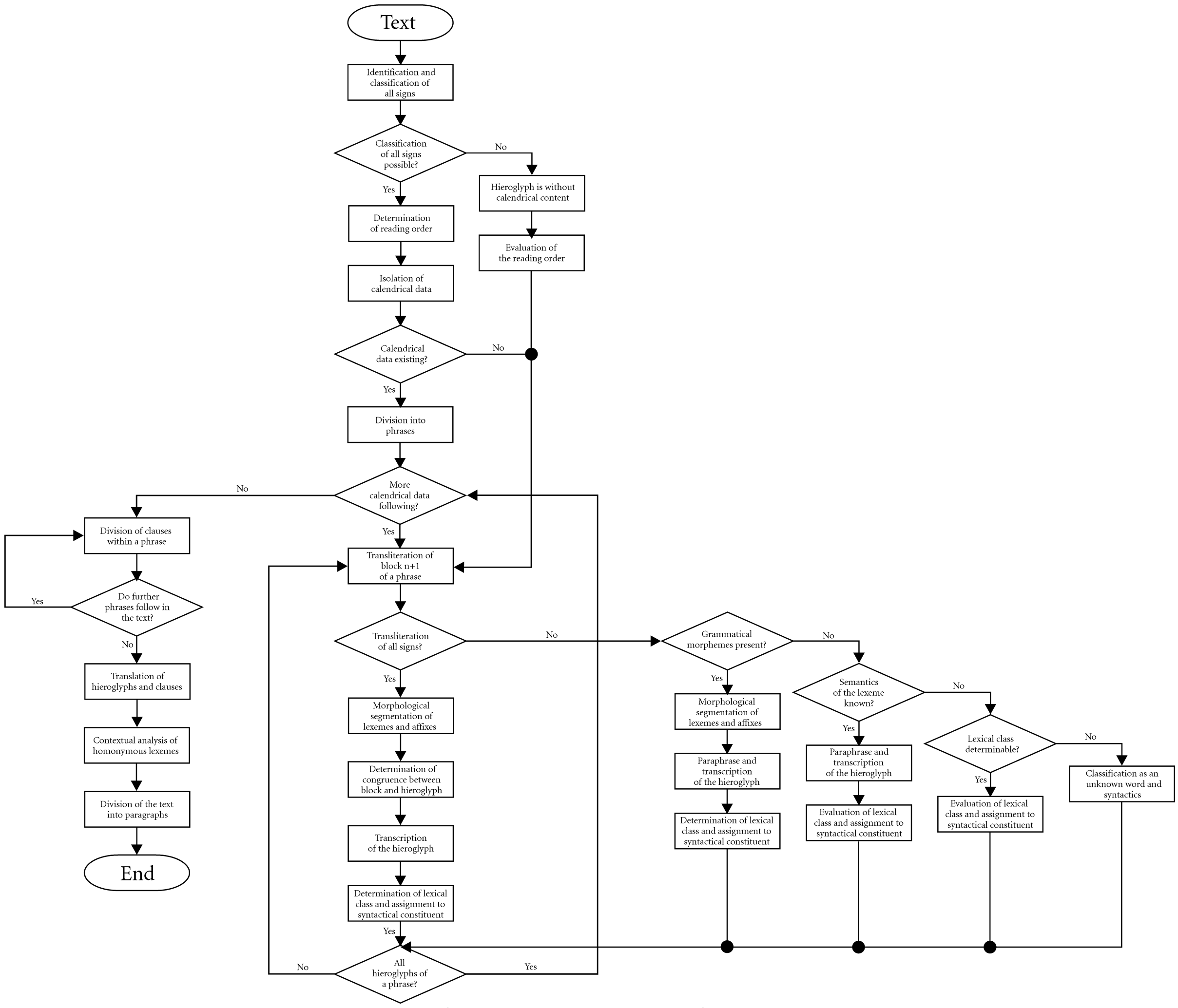

Figure 10: Flowchart detailing the fundamental steps of a source immanent analysis. Terminologically revised after Gronemeyer (2006b: fig. 1).

Also, collocations that resist any reliable reading or segmentation into root and affixes are excluded[102]. This contrasts group 4, where at least one likely possibility is provided. In case no reading can be determined by substitution patterns from other contexts, there will be the danger that a very low percentage of spellings might be missed. As the thesis is not primarily focused on deciphering new signs, no methodological corrective is in place to avoid such cases, although the rareness of a sign might be especially insightful.

It needs to be clear that the data base is nothing more than a collection of raw data, primarily on the current state of research. Only by analytical refining, it is possible to format the data in a way that

[102] One example is **bo-ja** on COL Yax Wayib Mask, F3. One could assume an *–aj* suffix with a *boC* root being the predicate of a new clause, or it might be a spelling for *boj* as the last segment of the agent of the previous clause. While we can isolate the nominal phrase *Chak Tzulaj Chan Yopat K'ahk' Ohl K'inich* on K4669, B5-A6 (cf. Colas 2004: 115-117), and within the assumed root **tzul* – which is not attested in Ch'olan (with the Yukatekan meaning "dog" excludable). While we surely deal with a group 1 spelling, the lexeme class and suffix function cannot be determined (also see Chapter 4.2.1.2). With **u=tz'i-ba=li-na-ja** on K1379, E1-I1, we can identify the root as *tz'i[h]b-a*, but the remainder leaves the impression that the scribe was not sure to write either *u-tz'i[h]b-al* or *tz'i[h]b-n-aj*. Alternatively, Boot (2005c: 2) considers **[u-]naj* to possibly follow in a couplet, as we have a few cases were **na-ja(-la)** is written alone (e.g. K595, B1, K1080, A3), but occupying a position typical for *tz'i[h]b* expressions (Chapter 4.1.1). The exclusion also compromises of any 'pseudo-text' examples (following Calvin's [2006: 24-27] categorisation), such as ZH8 **K'AL** prefixed and postfixed by mirrored **na-ja** on K3045.

they become useful for hypotheses and interpretation. Especially the assignment of a sample to one of the analytical showcases (Chapter 2.1) requires its review against the objectives and desiderata.

2.4 – The Analytical Workflow

THE FOLLOWING SECTIONS WILL OUTLINE the multi-tier workflow to organise the compiled samples and preprocess them for the analysis proper. The obtained evidence will be interpreted against the grammatological and linguistic background as sketched in the desiderata. Several constraints restrict the analyses for what they are not going to achieve (or cannot conform to), as well as circumstances with ramifications to the analysis.

2.4.1 – Data Preparation

The analysis of the data is conducted in a multi-tier process to (1) obtain data sets tailored to pursue specific questions related to the thesis topic and (2) evolve the answers from an overall picture to more granular aspects and questions. Before the analyses proper start, each data sample is again reviewed. By doing so, the collected raw data samples (as per Chapter 2.3.2) are subject to verification of applicability for a test group, their stringency and uniqueness in the data base.

With the data base organised in tables equalling root morphemes, all spellings of a lexeme within one table are sorted according to the function of the suffix (sample attribute 1f, see Chapter 2.3.1.1). Several data base queries to be conducted aim at obtaining certain key figures (see Chapter 3.3 and Appendix C) necessary for any of the statistical analyses and subsequent interpretation.

2.4.2 – Data Processing

At first, several sets are being defined to contain all samples and certain characteristics of them as elements. These sets are either subsets or intersections to each other, hence key figures may appear in different permutations. The process of obtaining the key figures can be summarised as follows:

(1) Let S be the set of all samples and $N_S := |S|$

This determines the overall number of samples collected in the database, hence $S \neq \emptyset$.

(2) Let $M \subset S$ be the set of all spellings with a morphographic root and $N_M := |M|$

Among all samples, a certain number of morphographic roots (sample attribute 1g) including any phonemic complement) is expected, hence $M \neq \emptyset$.

(3) Let L be the set of all different root morphemes and $N_L := |L|$

This determines the totality of all lexemes known from ClM.

(4) Let $R = L \cap S$ be the set of all different root morphemes among the samples and $N_R := |R|$

All samples contain a specific lexeme to which a showcase suffix is attached, determining the overall number of different root morphemes in the database, hence $R \neq \emptyset$, although not all lexemes are recorded in the database as a sample.

(5) Define sets $R_1, \dots, R_{N_R} \subset R, S$ to be a sequence of sets that each contain all samples for all N_R root morphemes and $N_{R_1} := |R_1|, \dots, N_{R_{N_R}} := |R_{N_R}|$

Each root lexeme in the database will be represented with a certain number of samples, hence $R_{N_R} \neq \emptyset$, although not all known occurrences for one root lexeme will be part of the database (Figure 11a).

(6) Define sets $F_{1PASS}, \dots, F_{4TEMP} \subset S$ and $N_{F_{1PASS}} := |F_{1PASS}|, \dots, N_{F_{4temp}} := |F_{4TEMP}|$

A sequence of sets for each suffix function (sample attribute 1f), containing all samples that adhere to this function.

(7) Define sets $O_{1.a.i}, \dots, O_{4.a.iv} \subset S$ and $N_{O_{1.a.i}} := |O_{1.a.i}|, \dots, N_{O_{4.a.iv}} := |O_{4.a.iv}|$

A sequence of sets for each spelling variant (sample attribute 1h), containing all samples that feature this spelling scheme.

(8) $U_{i,j} := R_i \cap \mathrm{F_j}$, for $i \in \{1, \dots, N_R\}$ and $j \in \{F_{1PASS}, \dots, F_{4TEMP}\}$

This set relates all samples that share the element j of one of the suffix functions to a root morpheme i in the data base, where some $U_{i,j} = \emptyset$.

(9) $V_{i,k} := R_i \cap \mathrm{O_k}$, for $i \in \{1, \dots, N_R\}$ and $k \in \{O_{1.a.i}, \dots, O_{4.a.iv}\}$

This set relates all samples that share the element j of one of the spelling schemes to a root morpheme i in the data base, where some $V_{i,k} = \emptyset$.

(10) Determine for $i = 1, \dots, N_R$ and $j = F_{1PASS}, \dots, F_{4TEMP}$:

$$N_{U_{i,j}} := |U_{i,j}|$$

and

$$\widetilde{N}_{U_{i,j}} := |U_{i,j} \cap M|$$

As a result, the overall number of all samples (and those with a morphographic root) for a specific root morpheme are obtained that belong to one of the suffix function groups.

(11) Determine for $i = 1, \dots, N_R$ and $k = O_{1.a.i}, \dots, O_{4.a.iv}$:

$$N_{V_{i,k}} := |V_{i,k}|$$

and

$$\widetilde{N}_{V_{i,k}} := |V_{i,k} \cap M|$$

In parallel, the overall number of all samples (and those with a morphographic root) for a specific root morpheme are retrieved that belong to one of the spelling scheme groups.

(12) Determine for $i = 1, \dots, N_R$ and $j = F_{1PASS}, \dots, F_{4TEMP}$ and $k = O_{1.a.i}, \dots, O_{4.a.iv}$:

$$N_{U_{i,j},V_{i,k}} := \left|U_{i,j} \cap V_{i,k}\right|$$

and

$$\widetilde{N}_{U_{i,j},V_{i,k}} := \left|U_{i,j} \cap V_{i,k} \cap M\right|$$

Finally, the number of samples (and those with a morphographic root) for a specific root morpheme is obtained for each suffix function set that intersects with each spelling scheme set (Figure 11b).

This last step directly relates to the core question of the thesis, which is less the overall distribution of orthographic patterns, but the variety of spellings among functionally determined suffixes. Thus far, focus has only been laid on the part-of-speech of the root, the function of the suffix and the classification of the spelling. By having conducted these queries, specialised sets of data and figures are present to eventually pass these again through recurrent filters for specific questions, such as the distribution of certain spelling patterns across geographic regions of the Maya area or throughout specific time intervals (see Chapter 2.5.4).

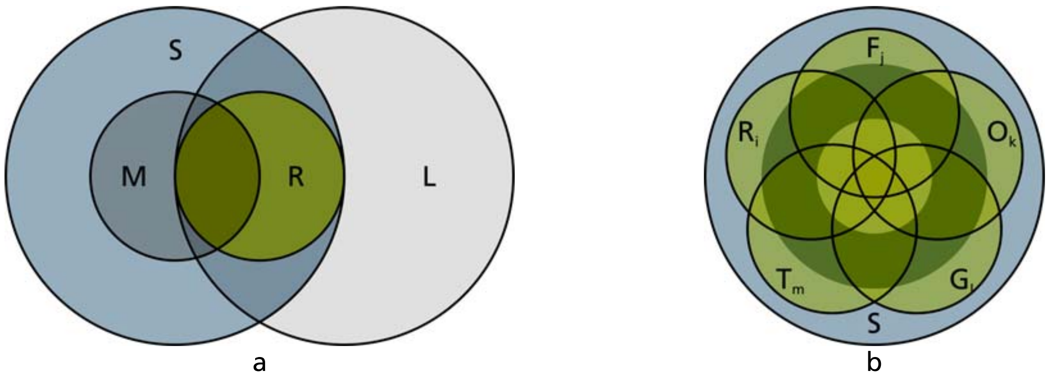

Figure 11: Venn diagrams of the basic sets in the database. **a)** Relations between sets *S, L, M, R,* **b)** Relations between sets *S, M,* R_i, F_j, O_k, G_l, T_m. Sven Gronemeyer.

(13) Define sets $G_{Tabasco}, \dots, G_{N_G} \subset S$ and $N_{G_{Tabasco}} := \left|G_{Tabasco}\right|, \dots, N_{G_{N_G}} := \left|G_{N_G}\right|$

(14) Define sets $T_{8.17}, \dots, T_{N_T} \subset S$ and $N_{T_{8.17}} := \left|T_{8.17}\right|, \dots, N_{T_{N_T}} := \left|T_{N_T}\right|$

(15) $W_{i,l} := R_i \cap \mathrm{G}_1$, for $i \in \{R_1, \dots, R_{N_R}\}$ and $l \in \{G_{Tabasco}, \dots, G_{N_G}\}$

(16) $X_{i,m} := R_i \cap \mathrm{T_m}$, for $i \in \{R_1, \dots, R_{N_R}\}$ and $m \in \{T_{8.17}, \dots, O_{N_T}\}$

Involving sample parameters 2d and 3c, the process is analogue to the one above. In a first pass, these queries will be conducted within a collated set of all samples (the overall process is summarised in Figure 12), instead of directly conducting a query within the intersection of sets as determined in steps (9) to (10). These bear the danger of receiving a multitude of fragmented, empty sets.

I will not detail these steps further, as the combination of parameters is detailed in step (11) and the number of possible combinations exceeds the cope of the thesis. However, certain questions might make such a detailed analysis necessary and this is related to the linguistic foundations and hypotheses made in Chapter 3.1. An example is the historical development of a suffix, as it was already outlined by several authors for the spread of the intransitive positional –*wan* from a vernacular context into the hieroglyphic writing as a whole.

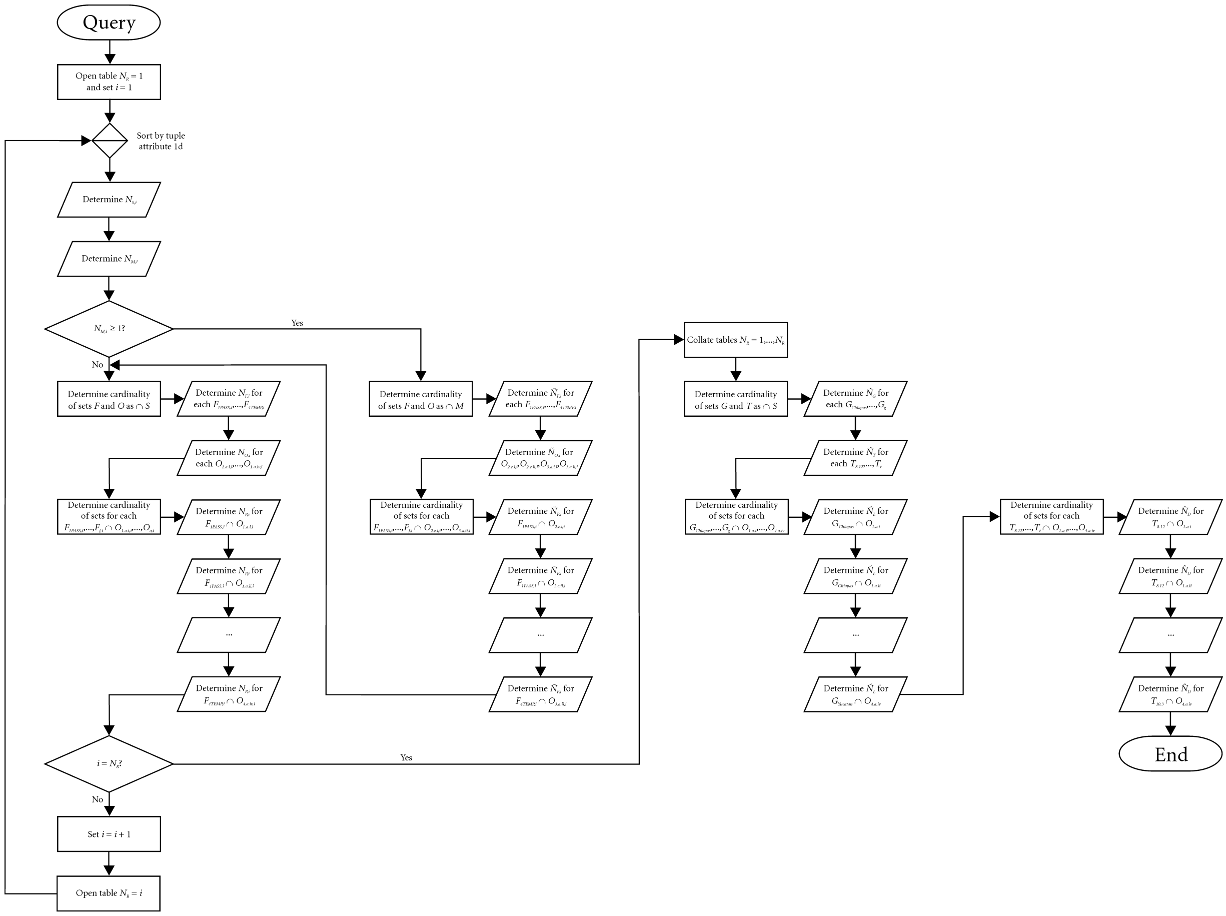

Figure 12: Flowchart detailing the query steps in the data base to obtain the key figures for further analysis and statistical interpretation. Sven Gronemeyer.

In the end, not only figures for a certain spelling scheme in connection with a suffix function are intended to be obtained. The advantage of the present database is to also provide a breakdown to demonstrate regional or temporal preferences and eventually trace isographs and isoglosses, if the data provide such detail. The intensive variability to build subsets of data by the sample attributes ultimately produces a multi-dimensional scatter-plot, but two- or three-dimensional intersecting planes of characteristics are sufficient for this study.

The figures gained from the data analysis are absolute and require conversion into relative frequencies for comparison among the sets. The assessment of the hypothesis of vowel integration not only requires a review of the spelling schemes for the functional groups for one lexeme. A statistical significance for one showcase of one lexeme is a mere indicator. Further support needs to be gained by comparison with the other showcases for one lexeme, but also for the single showcases among all lexemes. Of course, the result that any of the showcases proves the hypotheses to be true does not mean that automatically all other test and control groups will not be false.

More parameter queries and combinations are possible without necessarily being detailed at this point, as they may also be considered as complementary information only with respect to the thesis topic. This for example concerns statements about the use of allographs of any syllabogram among the spellings, especially against the background of a geographic and temporal distribution.

The figures retrieved for the cardinality of orthographic schemes in conjunction with the suffix function and eventually their geographic or spatial distribution require more interpretation than just their comparison among each other, involving linguistics (see Chapter 2.5.3.2).

2.5 – The Interpretational Framework

WITH THE KEY FIGURES EXTRACTED from the data base, the framework to interpret the data can now be laid out to test the data against the hypotheses in Chapter 3.1. The testing process will argue by external linguistic and internal grammatological evidence. The statistical analysis of the key figures is a further step in the refinement of the sample data and possibly provides a first tendency whether the assumption of generally integrative spellings is probable or not. However, various factors delimit the validity of the statistics.

2.5.1 – Hypotheses Formulation and Testing

The selection of the showcases (Chapter 2.1) is based on the current state of research. Before any correlation between linguistics and the spelling patterns can take place, the suffixes require a functional review on the basis of comparative linguistics.

The general approach partly follows 'abductive reasoning' (cf. Peirce 1931-58, V: §§ 170-171). Comparative linguistics leads to the abductive formulation of hypotheses regarding the suffix and its allomorphs to be expected for Classic Mayan (including vernaculars), immediately followed by the deductive step with the prediction of spelling patterns based on the linguistic evidence (Chapter 3.1). Finally, the comparison with the epigraphic data distilled by the workflow described in Chapter 2.4 and presented in Chapter 3.3 is the inductive step, supported by the statistical methods of Chapter 2.5.2. The implications of the last step are subject of Chapter 4.

The main objective is to compile a list of attestations for forms among the Mayan languages by grammars and lexicons. This is less to confirm the function of the suffix in Classic Mayan, as the selection of the showcases for this study already had to accept morphosyntactic premises from the current state of research. An extensive comparison of functionally equivalent suffixes is more to obtain the phonological (and potentially semantic) variability of the suffix across different languages and draw parallels. This is both to demonstrate similarities, but also differences among the different Mayan languages. Among the cognate forms, the nature of the suffix consonant is of lesser concern, as it is likely to be fairly consistent. Otherwise, the usual phonological variations (Campbell 1984: tab. 2) are to be expected (e.g. GLL /y/ ~ EM /r/). As the study focuses on the orthographic representation of suffix vowels, the vocalisation of the suffixes in the different languages is far more important: (1) what are the cognates, (2) what are the allomorphs, (3) in which way are these morphophonemically conditioned and (4) is there evidence for vowel complexity.

Given the general affiliation of the Classic Mayan language (Chapter 1.2.2.3) as Ch'olan and acknowledging the influence of vernaculars, not all Mayan languages are equally suitable for the comparison. The assessment therefore has to be made with staggered sets, according to the language families (Figure 4). Closest accordance is expected with the Ch'olan languages (pCh; WCh: CHL, CHN; ECh: CHR, CHT) which are taken as the first set. The branches of attested vernaculars (i.e. Yukatekan and Tzeltalan) complement a second set (Yu: ITZ, MOP, LAK, YUK; pGT; Tz: TZE, TZO). Within, Yukatekan will be given more prominence as opposed to Tzeltalan. The distribution of sites with vernacular influences (Figure 2) demonstrates a greater number of sites to feature Yukatekan evidence than Tzeltalan. With Greater Tzeltalan included, another comparison will be drawn with its sibling, the Greater Q'anjobalan languages (CT: CHJ, TOJ; Qa: QAN, AKA, POP, MCH) as a tertiary set. From these, especially the Chujean languages are of interest, as they occupy the southern fringes of Chiapas. While Lacadena and Wichmann (2005a: 36) see Tzeltalan vernacular evidence in Chinkultic, we also may speculate on Chujean influence here and the surrounding area (see Figure 3).

The establishment of the comparative correspondences for the function-phonemics pairing allows to derive a set of potential vowels for Classic Mayan. These options can then be reviewed against the orthographical realisation in hieroglyphic writing to verify the same pairing here. Even more, the breakdown of the linguistic data into language families and sub-branches allows not only to hypothesise a 'general' (Common Ch'olan) Classic Mayan vocalisation, but seek potential differences between Eastern and Western Ch'olan and for Yukatekan and Tzeltalan. With the regional segmentation (Chapter 2.5.4), limited and very specific conclusions for the orthography and the underlying phonemics can be drawn. In the end, the analysis and discussion of the combined evidence (phonemics, orthography, language affiliation) may result in a better understanding of the spatial distribution of Mayan languages in the Classic[103] as reflected in the inscriptions (cf. Wichmann 2006a: 280-284) and the course of isoglosses.

Of similar interest as the spatial data is the diachronic tracking of the same information. Likewise, the first and last appearance of a certain suffix form as evidenced by the orthography can be traced (Chapter 2.5.4). If the evidence is firm enough, this may as well lead to new insights on the branching of the Greater Lowland Mayan languages (cf. Kaufman 1976), so that epigraphy can calibrate glottochronological evidence.

[103] The Postclassic is not too much of a concern, as most inscriptions from that time originate from the Yucatan peninsula and only few of them are attested from a specific archaeological site (see Chapter 2.5.3.3). The majority of samples for that time are from the codices.

With the linguistic postulates primarily on a genetic basis, a number of generalised spelling patterns (without any pretence of completeness) can be derived that may be expected as a reflection of the spoken language of a specific branch. As no data are yet available for a spatial and diachronic breakdown, a general Ch'olan view is applied with vernacular possibilities as addenda. Considering the 'relative uniformity' (see Chapter 2.5.3) within a Classic Maya writing tradition, we may expect those 'Common Ch'olan' features to regularly appear in the region of spoken vernaculars. Therefore, the common forms are not repeated among the Ch'olan vernacular forms. Identical evidence from Yukatekan and Tzeltalan is of course included as a cognate form. The prerequisites for the spelling proposals depend on the particular linguistic comparison and are outlined for each test group in Chapter 3.1.

In proposing the synthesis and the generalised spellings, I generally follow Hoenigswald (1960) and his 'binary comparison' and Campbell's (2004: 125-147) multi-step comparison sets for a comparative distillation of Common Ch'olan (i.e. prevalent ClM form), Western and Eastern Ch'olan, Yukatekan, and Tzeltalan forms. Furthermore, wherever necessary, considerations from earlier developmental stages are included. This above all includes immediate predecessors, such as pre-pCh and pGT. However, several caveats need to be made in the summarising discussion (Chapter 3.2.1).

2.5.2 – Statistical Methods

To what extent the epigraphic evidence is actually congruent with the linguistic evidence and the hypothesised vocalisation in Classic Mayan is the next question to pursue. To correlate both, the key figures gained from the first analytical workflow (Chapter 2.4) become subject of a second analytical cycle, the scrutinising by statistical methods as Occam's Razor.

In the following, I will exemplify the statistical analysis just by *S*, the set of all samples, for reasons of simplicity. The same is analogously true for all subsets of samples defined in Chapter 2.4.2.

For a large set *S* of spelling samples, one could assume that the samples are equally distributed among the spelling schemes and that any random sample picked from the set has an equal probability to adhere to one of the 32 spelling from the four groups, as per the Laplace formula:

Let $\Omega = \{O_{1.a.1},...,O_{4.a.iv}\}$ as the sample space for all spelling schemes, thus $N_\Omega := |\Omega| = 33$

The probability for any spelling scheme would therefore be $p = \frac{1}{|\Omega|} = 0.\overline{03} \approx 3.03\%$

However, following the law of small numbers (von Bortkewitsch 1898), it is unlikely that the recurrent taking of a sample from *S* will show an equal distribution. We cannot assume that all spellings will follow the principle of indifference (Keynes 1921: 42), as they are not symmetrical. Each spelling scheme itself has a variable cardinality within N_S. We can take for granted that certain spelling schemes (and thereby also spelling groups) result in a higher cardinality than others, as these are determined by linguistic and graphematic determinants (Chapter 2.5.3.2).

From linguistics, we can apply Zipf's law (Zipf 1935: 40-47) to explain a variety of power law probability solutions. In its original sense, the law basically states that certain lexemes occur more often in a text corpus than others. As these lexemes can be attributed to a specific part of speech (see Chapter 1.2.2.2), we can also assume a Zipfian distribution for grammatical morphemes under the following premises (see Chapter 3.3.1): (1) inflectional affixes (such as pronouns and stem-formative suffixes) are determined by the part of speech and the morphosyntax and are supposed to show a close relation to the lexemes within a lexical class, (2) specific derivational suffixes are restricted to a specific part of speech and result in a ranked usage within each lexical class.

Of course, the frequency of lexemes, and with them their grammatical morphemes, is determined by the scope, genre and content of the texts within the corpus (see footnote 99). In any case, certain lexemes and with them a variety of affixes will show a preponderance against others. This will be reflected in graphematics. For example, if no morphograph exists for a lexeme, there will be no spellings for the sub-groups 2.e or 3.a. For a specific morpheme string (lexeme plus suffix[es]) for one of the showcases, there will never be enough spelling possibilities to create a sample for each scheme (as for example synharmonic and disharmonic are mutually exclusive). The different factors that may affect the distribution also do not entirely cancel each other out.

When examining *S* for the specific spelling schemes, we end up at a discrete probability distribution. It is discrete because the spelling schemes as per Chapter 2.2.2 are disjunct categories. It can be approximated with a cumulative binomial distribution (cf. Yule 1911: 287-309):

$$F(n;k;p) = P(X \le k) = \sum_{i=0}^{k} P(X = i)$$

When plotting the results in a diagram, the result is a bar chart. On the ordinate, the number n_O of all samples adhering to one scheme is given, normalised to provide the relative frequency (percentages):

$$h_O = \left(\frac{n_O}{n}\right) \cdot 100$$

Each spelling group as a whole is colour-coded for easy recognition (1: green, 2: yellow, 3: red, 4: grey) and the schemes are cumulatively ordered by their frequency (Figure 13a). Both will facilitate a visual reception of the chart's data. Such charts for the spelling frequency will be drawn for all appropriate data sets (i.e. per root morpheme, per functional group, per region, etc.). Similarly, stacked bar charts are used to illustrate the distribution of spelling schemes for the different showcases across geographic regions and/or time (Figure 13b). Multivariate data (such as cardinality and runtime of a parameter) in later analytical steps can be visualised by other ways of representing, such as frequency diagrams (seriations or 'heatmaps'), or maps with diagrams.

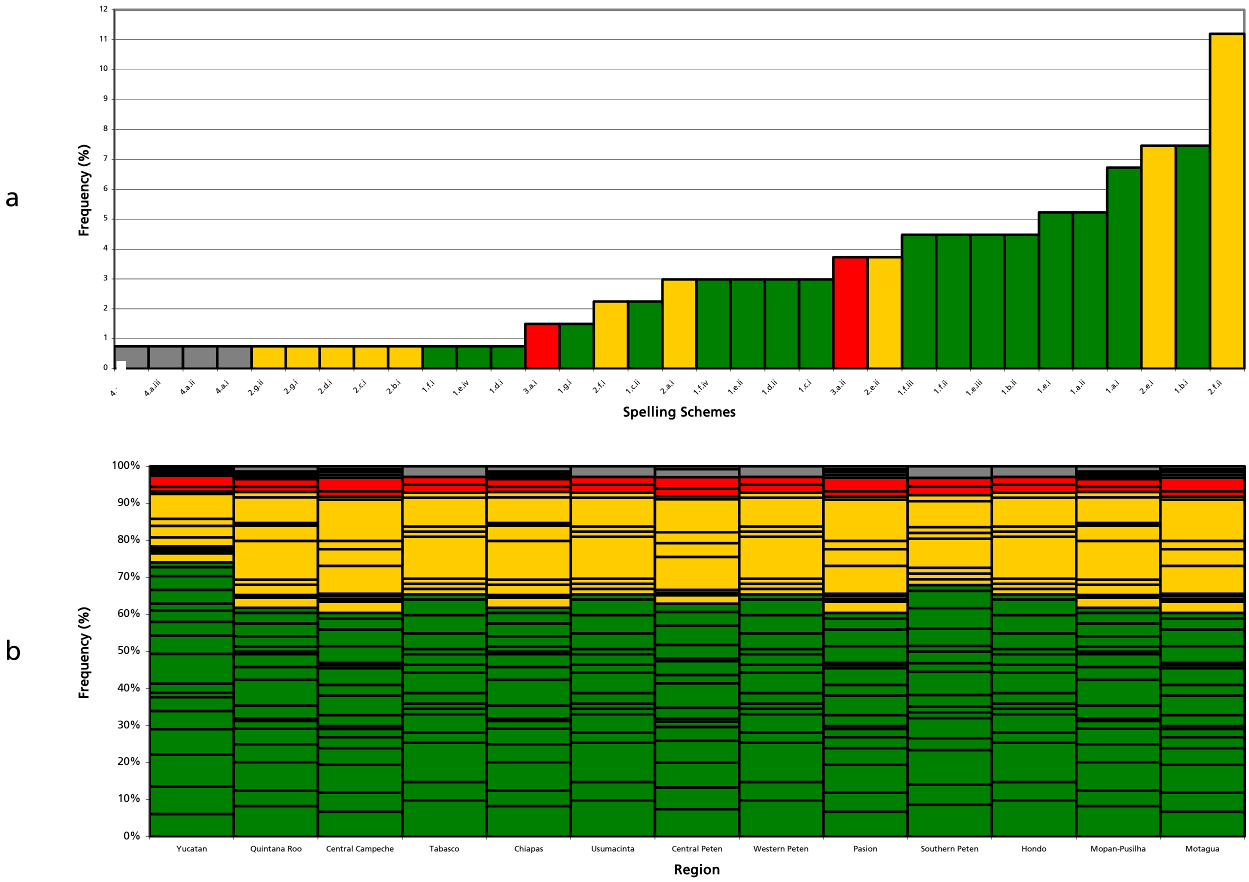

Figure 13: Examples of distribution bar charts. **a)** Chart showing the relative frequency of spellings in any kind of set, categorised by the spelling schemes and ordered by frequency, **b)** Chart featuring the normalised distribution of spelling patterns across a secondary feature (here: geographic regions). Sven Gronemeyer.

The following describes the statistical steps to answer if among all N_S the amount N_1 of vowel-providing spellings from group 1 is indeed the scribe's preferred choice.

(1) Formulate null hypothesis H_0 and alternative hypothesis H_1:

$H_0 : n_1 < k$ and $H_1 : n_1 \geq k$

The null hypothesis assumes no preference for group 1 spellings, hence n_1 is smaller than the critical value *k*. The alternative hypothesis is attempted to be proven true, hence n_1 has to be equal or larger than *k*.

(2) Given *n* and *p*, find for a given significance level *α* the smallest *k*, such that:

$F(n; p; \alpha) = P_{n;p}(X \geq k) \leq \alpha$

As the critical value, *k* is the lower bound which n_1 must at least equal for H_1 to be true. Let the following parameters be defined to obtain *k*:

$n = N_S$ as the number of all samples from *S*,

$p = \frac{|\Omega_1|}{|\Omega|} = \frac{17}{33} = 0.\overline{51}$ as the quotient of the number of group 1 schemes to all schemes,

$\alpha = 0.99$ as a significance level of 1%, and

$X = n_1$ as the number of all samples from spelling group 1.

A level of 1% is chosen to increase the confidence in the determination of the significance, even when running into the danger that H_1 is easier rejected. If so, it is to be discussed what factors may have had an impact to do so (see Chapter 2.5.3), primarily assuming a Type II error that may be the result of linguistic or graphematic determinants.

In the example of Figure 13a, we have n = 134 and n_1 = 81, therefore k must be equal or smaller than n_1 to falsify H_0. With the given parameters, the statistical test delivers k = 82 which falsifies H_1, but is no evidence that H_0 is true. When applying a significance level of 5%, we get k = 79 which proves H_1 true and falsifies H_0, as the k value for all other spelling groups is bigger than their n value. The probable reason why H_1 is falsified with $\alpha = 0.99$ is the significant amount of 2.f.ii spellings. That means we have a considerable amount of syncopated spellings (see Chapter 2.2.2.2) among the samples.

To prove this assumption, we have to determine whether the value of 15 samples for scheme 2.f.ii is a statistical outlier for the total of 41 samples within 10 group 2 schemes.

(1) Determine the mean for all spelling group 2 examples:

$$\overline{X}_{arithm} = \frac{1}{n}\sum_{i=1}^{n} X_i = \frac{41}{10} = 4.1$$

(2) Calculate the standard deviation for spelling group 2:

$$S = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}\left(X_i - \overline{X}\right)^2} = \sqrt{\frac{194}{10}} = \sqrt{19.4} \approx 4.41$$

Spelling group 2 spellings would show a standard deviation of 4.1 ±4.41, or a value rounded to an integer between 0 and 9 spellings for each scheme. Therefore, spelling scheme 2.f.ii is significantly higher and there is good reason to consider it an outlier and evidence for a Type II error. The explanation why requires discussion, e.g. the showcase encompasses a significant amount of spellings in a context where another suffix to follow is required and therefore the showcase suffix is syncopated. The example with scheme 2.f.ii can be anticipated as a common reason for some of the showcases, whereas subsequent suffixation and therefore syncopation is excluded from others.

When 'correcting' the amount of scheme 2.f.ii spellings to the maximum of 9 samples allowed by the standard deviation with n = 128 resulting, we obtain k = 81. As $n_1 \geq k$, H_0 is falsified and the assumption that vowel-providing spellings are preferred, is proven true.

The smaller k is in comparison to n_1, the more significant is spelling group 1 regardless of the significance level chosen, i.e. the more are vowel-providing spellings a scribe's preferred choice. Until a certain ratio between n_1 and k, spelling group 1 H_1 is always true and H_0 false. This ratio is dependent on the cardinality of other spelling groups. Even when k is still smaller or equal than n_1, regardless of the significance level chosen, this is then no automatic proof any more that H_0 is false for spelling group 1 while H_1 is true. When testing other spelling groups individually for their significance with a parallel hypothesis, they may also prove their H_1 to be true.

Consider $n = 350$ with $n_1 = 220$ and $n_2 = 130$, with $\alpha = 0.99$. For n_1 with $p \approx 0.51$, $k = 202$ and for n_2 with $p \approx 0.3$, $k = 126$ is obtained. Both spelling group 1 and 2 would be proven true at the same time, showing that their amount of samples is significant enough. The circumstance that the test for n_2 alone (or n_3 for test and control group 3) would also be true and is not directly rejected by the amount of n_1 is evidence for a still significant amount of spelling group 2 (or group 3) examples. In this case, this is an indication for a rather balanced scribal choice between vowel-providing and mere morphographic spellings. In this case, H_1 of spelling group 1 will be taken as true, but H_0 not as rejected. Given the broad range of possible spelling patterns, this would be the expected result in favour of vowel-providing writing. In the above example, the distance between n_1 and k is larger than between n_2 and k, showing a tendency towards a full phonemic orthography.

On the other end, group 1 spellings may be so insignificant among showcase and their k value so high that H_1 is false and H_0 true, i.e. that spelling groups 2 or 3 are at the same time so significant they are by far the preferred choice in writing. In any case, all three options require discussion with regards to other factors, e.g. the frequency of morphographs or the amount of samples for a specific lexeme for which no morphograph exists.

The statistical methods described above can also be used with other spelling groups or just for a specific spelling scheme to determine its significance. Such an approach could be justified with a very specific set to analyse. This could be the distribution of a spelling variant for a single suffix or lexeme in a narrow time frame and specific region to answer the question if there was possibly a ‘scribal school’. These methods are appropriate for the significance of spelling schemes, which are most relevant for the determination of orthographic preferences and conventions. As these base on the written fixation of natural language, further investigations are appropriate to support the significance of these tests, based on the content that was recorded. Chapter 3.3.2 provides some additional considerations regarding this aspect and also deals with the theoretical background.

2.5.3 – Analytical Conditions and Constraints

As writing denotes spoken language, it is reasonable to assume that phenomena of daily language practice are reflected in writing. This expectation can be made regardless any hypothesis of the affiliation of Classic Mayan, either following the Classic Ch’olti’an hypothesis (Houston, Robertson and Stuart 2000) of an elite literary language or acknowledging the influence of vernaculars (Lacadena and Wichmann 2002, 2005a) even in formal discourse.

However, one important aspect is inalienable for the present investigation of the orthographic convention of Maya hieroglyphic writing and the investigation of the vocalisation of Classic Mayan: the normativity of the results from a grammatical and orthographic perspective. I will elaborate these thoughts in the following chapters to provide a grammatologically conditioned background of why mere figures and eventually also the statistical methods may alone not be sufficient to describe the orthographical patterns of Maya hieroglyphic writing.

2.5.3.1 – Descriptive and Prescriptive Grammars

This study pursues to bridge prescriptive and descriptive grammars, although it has frequently been pointed out that the dichotomy between them is only ostensible (cf. Klein 2004). As a natural consequence of the research of an extinct language, its grammar is an *a priori* descriptive result by philology, but mainly by comparative linguistics (Kaufman and Justeson 2009: 221). It is, as Klein (2004: 399) notes, an author's analytical intent to describe existing data and to provide the framework for future descriptions.

In this sense, this study is descriptive. Before even conducting the analysis, spelling schemes (at least as a subset from numerous more possibilities) have been defined, but only as a device for the further objectives. One is the analytical review of orthographic patterns from hieroglyphic texts to result in empirical figures to illustrate the frequency of certain spellings in Maya epigraphy. They quantify the description that these spellings are possible in writing, they provide unfiltered preferences without reviewing the spellings. But the figures do not involve the rationale for any spelling chosen or provide an explanation for varying frequencies in the epigraphic data (see Chapter 2.5.3.2 below).

Of course, the verification of certain linguistic traits and forms in Maya writing is nothing but descriptive. As previous studies did, we can attest the occurrence of phonological and morphosyntactic features in the script, tie them to branches of the Mayan language families and observe their geographic and chronologic distribution and eventually find them represented in spelling practices. The hypotheses on the harmony rules (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004, 2005b, Robertson et al. 2007) or the orthographic distinction of spirants (Grube 2004d) are perhaps the best examples from earlier research.

But at the same time, the Classic perspective of grammar and orthography is evoked, intimately tied to the question of prescriptive features. Thus far, the question of the existence of an autochthonous language and orthography description (see footnote 25) has only indirectly been tangled. We can clearly infer from epigraphic data, such as the harmony rules suggest, a normative component in Maya writing, but to what extent was it prescriptive? As the spelling schemes from Chapter 2.2.2 suggest, variety was given to the scribes (alone by the nature of the morpho-syllabic writing system) and chosen by them. The figures for the frequency of a certain orthographic rendition may indicate a 'best practice' – with certain spellings more preferred than others. In this respect, we may follow Riese (1988: 67-69), who investigated the development and distribution of the 'Initial Series Complex' from an uncoordinated and locally varying calculation in the lowlands to a system of uniformity across the whole Maya area. Riese (1988: 69) considers "a system of higher education whose upper levels must have had a high rate of international, Maya-wide academic exchange." As also the studies on the distribution of positional inflection (Hruby 2002, Hruby and Child 2004) have shown, language, grammar and orthography gradually evolved and their adoption and reflection in writing seem to be a natural process. Without the necessity of a Classic 'Academia de las Lenguas Mayas', cultural exchange may have been the conveyor of linguistic and orthographic forms and took care a relative uniformity. In this sense, we may speak of a 'peer prescriptivity' in Maya writing to provide a linguistic 'canon' broad enough for every scribe to pick an applicable form and common or narrow enough for each recipient to correctly interpret this form by his linguistic competence[104].

The epigrapher is in an unequally disadvantaged situation in this respect, as he has to rely on a reconstructed competence. Epigraphic studies necessarily bias future work by a certain prescriptivity, as again demonstrated by the harmony rules, which are taken to apply them to spellings previously not considered. As Klein (2004: 399-400) argues, linguistic insights are basically an excerpt of the totality of phenomena of language, the reception of analyses always carries prescriptivity of a varying degree. The present study is no exception, it bases on earlier research to develop it further and explicitly evokes both components. The results of this thesis thus might also aid epigraphers to consider specific spellings as a certain form and thus bear a prescriptive component.

The explanation of orthographic patterns is descriptive, but their connection with linguistic data pre-empts an anticipation of their underlying morphosyntax. This already applies for the analytical showcases, but even more for suffixes not considered in the study. The showcases only reflect a section of the linguistic and orthographic reality, but are intended to act as role models for other suffixes by their representativeness. Klein (2004: 400) in particular mentions orthography as an example for the reconciliation between the descriptive and prescriptive function of linguistic studies. In connection with didactic language materials, Göpferich (2000) suggests the term "prospective", which has particular appeal for the present study, as the epigraphic analyses aim at two kinds of predictions.

This is on the one hand an interpretation of the empirical data by statistical methods. If certain spelling patterns prove to be normal distributed for the showcases, selected prognoses might possibly be given for orthographic representations. On the other hand certain notations are being taken as a device to verify the linguistically determined vocalisation of suffixes. This is supposed to be especially true for variable vowel suffixes by the chosen spelling variant and its eventual determination by the context.

Of course the analyses and interpretation of the epigraphic data are subject to several limitations. Some of them are linguistically determined, others by graphematics, but both may elude explanation or are not unequivocally diagnosable.

2.5.3.2 – The Variability of Linguistic and Graphematic Determinants

Several phenomena and questions from Classic Mayan and scribal practice may interfere with the epigraphic analysis of spelling practices. At least these need to be kept in mind in the interpretation as potential factors for deviating data in general or among specific sets.

[104] Such considerations also challenge Brown's (1991: 490) argument that Maya writing was kept deficient and difficult by the scribes to exclude larger social strata being the recipient (also see Houston and Stuart [1992] for a critical review). This necessarily must have decreased the number of knowledgeable scribes being able to understandably write and in any case avoid ambiguous spellings.

With focus on the showcase groups, it is a valid assumption to consider (and test against the data) that the kind of suffix vocalisation affects graphematics. The scribes were potentially more free in applying spellings in the cases of a linguistically predictable vowel, i.e. in the cases of either a fixed or root-reflecting vowel. Hereby, a greater variation for the vowel of the syllabogram indicating the suffix may be expected, e.g. an increase in **Ca=jV / __#** spellings for the test group 1 cases in contrast to the **Ca=ja / __#** expected by experience and possibly determined by harmony rules. Even more, such cases might yield a shift to feature more samples of spelling group 2 like **CV$_1$=ja / __#** to show no alterations in the spellings. On the contrary, more spelling group 1 samples might be expected for those suffixes with a variable vowel, such as the instrumental, where special need is given to unambiguously spell the vowel by integrating it. Likewise, as far as spelling group 3 is concerned, there might be a higher number of congruencies between the vowel of the syllabic sign to indicate the suffix and its actual vocalisation, as far as this can be inferred from a significant set of comparison from spelling group 1 cases.

At the same time, alterations among the vowel of the syllabogram indicating the suffix may not solely be the reason of a 'more loose' orthographical practice in phonemically fixed surroundings. Alterations of the syllabic vowel are also likely due to the interference with other suffixes. Here, it is important to consider morphemic vowel syncopation (cf. Mora-Marín 2003a: 27, 29), an aspect (see footnote 37) that has rarely been tracked down thus far by epigraphers. It has already been highlighted by several cases in this study, that alterations to harmonic spellings are potentially to be expected among the syllabograms involved at this C.C boundary.

Modifications of the syllabogram vowel are therefore to be expected in case other suffixes follow. With the hypothesis that spellings providing integrative spellings are chosen by trend, the same processes as among root spellings have to be observable: syllabograms with different vowels to match the one of the following suffix are chosen. Therefore, spellings are likely to alter in contrast to those cases where the suffix otherwise forms the juncture of the morpheme string[105].

But the variability of syllabograms across several morphemes has also not only these limitations which in allusion to morphophonemics (Trubetskoy 1929) I would like to call *morphographematic*. Especially in word final position with no other (graphematically realised) suffixes to follow, the 'looseness' of a syllabogram with a certain vowel for one suffix may find its limitation by the more common use of this grapheme and its allomorphs for a suffix of different vocalisation and function. As it has already been implied in Chapter 2.2.2.2, the restriction to a specific syllabogram in the suffix domain may be due to a reading aid on the visual layer (cf. Gronemeyer 2011b: fn. 20, also Tokovinine and Davletshin 2001). For example, although distinguishable by the presence or absence of the ergative pronoun, the reader would associate **CV$_1$=wa / __#** with transitives rather than with antipassives and their expected **CV$_1$=wi / __#** rendition[106]. It is maybe due to this circumstance, that the latter is also

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[105] Compare to **chu-ku=ji=ya** < *chu<h>k-j=iy* (CNK Trn. 1, K1) as the example for spelling scheme 2.f.ii, with **=ji** / __i instead of **=ja** / __#.

[106] It is also because of this visual layer that the idea of morphosyllables (Houston, Robertson and Stuart 2001b) was able to emerge. With regard to the idea of a graphematic reading aid, I support Tokovinine and Dav-

known for transitives. But other instances, especially among the abundant *–Vl* suffixes, may not be so overt, although recent research contributed much clarification (cf. Houston, Robertson and Stuart 2001b: 7-13), also refer to the implications for *–Vb* (Beliaev 2004).

The existence of a morphograph to denote any lexeme is another facet to bias the analysis. Especially spelling group 3 samples are expected to be more common for those roots for which a specific logogram existed. This may explain shifts in the distribution of orthographic renditions for any root in the analysis, but may not necessarily be true. The word *tz'ihb*, "writing" appears in many derivations especially in the Primary Standard Sequence (Grube 1991: 225-228, MacLeod 1990: 170-174) and a morphograph MR6 **TZ'IB** exists (cf. Boot 2003: 18) – yet, it is only known twice from one ceramic vessel (according to a set of 774 texts [Mora-Marín 2004c]), the Early Classic bowl K772 (Robicsek and Hales 1982: fig. 39a). This singular appearance surely was a single calligrapher's innovation[107], but other roots might exhibit a similarly low morphographic frequency. The ratio between purely syllabic spellings against morphographic root realisations for one lexeme is thus a corrective in the interpretation of the statistics of spelling schemes.

Although firm epigraphic evidence is missing and the number of samples may be rather restricted, loanwords may provide some ramification for suffix spellings. Lexical diffusion might not be so overt for forms where the foreign origin was lost due to long-lasting use, such as the word *kakaw* (Campbell and Kaufman 1976: 84, Dakin and Wichmann 2000, Kaufman and Justeson 2007, Macri and Looper 2003a: 285-286). Often, morphological compounds get reinterpreted as a single root (Pallán and Meléndez 2010: 9), and more importantly, the phonemics and phonology of the donor language require re-interpretation for a Classic Mayan spelling (see footnote 36). Widely known lexemes, such as *kakaw*, but also *pat* or *ohl* (Pallán and Meléndez 2010: 15-16) certainly received sufficient conventionalisation for consistent spellings[108] to eventually enable full integrative spellings. The conferment of a word into the host system of Classic Mayan however could yield different scribal interpretations in terms of phonology and morphosyntax that might influence suffix spellings.

Another aspect of variation among the syllabograms written for suffixes is 'vowel shorting', or at least the loss of orthographic distinction, supposed to have appeared by the end of the Late Classic (Houston, Stuart and Robertson 1998: 284-285, 291-292, Lacadena and Wichmann 2004: 115-116), at about the same time the contrast of the spirants (Grube 2004d: 79-81) was lost. The question however

letshin (2001), but question the implications, i.e. the existence of morphosyllables and the rules of disharmony as proposed by Houston, Stuart and Robertson (1998).

[107] Also refer to footnote 593 regarding several isolated innovations regarding morphographs for **TZ'AP**. Such cases of innovation, if broadened to orthographic rules, however can be tracked down by the combinatory analysis of schemes across time and space. Compare to Grube (2010) who considers preposed phonemic complements a Late Classic innovation (from about 9.13.0.0.0 on), unless they appear in three distinct environments: (1) lexemes with a glottal onset, (2) roots with a glide onset, (3) lexemes affected by the pGT [ʧ/ʧ'] < pM [k/k'] shift, all of these three known from the Early Classic on. As preposed phonemic complements apparently have no function to indicate phonemic features as they cannot be disharmonic, their introduction might go hand in hand with the trend to use full syllabic spellings in later times.

[108] This is probably most true for *kakaw*. As Zender (1999: 121-123) showed, the word is subject to frequent and varying underspellings – it was not only contextually (in PSS texts) widely known enough that any reader immediately would be able to recognise the underlying linguistic form.

remains to what extent the harmony rules apply to the suffix domain (Lacadena and Wichmann 2005b: 3-4) to possibly reflect complex vowels among them[109]. On the other end of the scale is the occasional conservation of archaic forms or their dedicated application in a text to linguistically and graphematically evoke an account from distant history[110].

Parallel to a temporal alteration of the perpetuated orthographic schemes (up to negligence), the same might alternatively or in combination happen on a regional basis. This may be due to different scribal schools and fostered by vernacular influences, restricting the common basis of spellings to a regional scope or audience[111] (cf. Lacadena and Wichmann [2002: 303-310] for further consideration).

Finally, there might be cases of spellings left as 'noise' for which the analysis eventually cannot distillate the reason. These might be cases where the underlying linguistics is not yet or only poorly understood. It might be a case of individual innovation or scribal ignorance. And it might be simply what is otherwise and sometimes too easily be taken as the 'bail-out' argument: a scribal error.

All these factors might have an impact on any of the samples collected in the data base, exclusive or in combination. The classification of a spelling into a functional group or a spelling scheme is certainly a facilitating devise for the analysis and the statistical interpretation of the data. Nevertheless, especially when no clear tendency is recognisable, each sample has to be reviewed against the complex nexus of linguistic and graphematic determinants and their ramifications to each particular orthographic realisation to seek an explanation.

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[109] See for example the synharmonic cases of **u-to=mo** < *u[h]t-om* on CRC Alt. 13, W3 or **WE'=o-mo** < *we'-om* on K5976, H1 in contrast to the regular **Co=ma / __#**. The interesting question is whether the proposed 'looseness' in orthography with predictable vowel suffixes is either the result or the trigger of these synharmonic spellings for at least the suffix domain or entirely independent. Possibly, there are temporal parallels to the increasing numbers of synharmonic spelling by the end of the Late Classic (from around 9.15.15.0.0 on) among root spellings which are supposed to reflect the development towards simple vowels in Ch'olan languages (Houston, Stuart and Robertson 1998: 291). The question still remains if ClM retained complex vowels at all (which is denied as an operating premise in this study), as all contemporary members of the Western Mayan branch except MCH (which additionally has other pM phonological reflexes, such as [ŋ] [Palosaari 2011: 24, 27]) do not feature it (cf. Law 2011: tab. 3). Even Kaufman and Norman (1984: 85-86) do not reconstruct long vowels, except pGT *[aː] > pCh *[a] and pGT *[a] > pCh *[ə] (although this distinction was not reflected in hieroglyphic writing and only survives in WCh). Also compare to Campbell (1984: 14) with pM [Vː] > pCh [V], with frequently [oː] > [u] and occasionally [eː] > [i]. Instead of explaining why the hieroglyphs should feature long vowels in contrast to the pCh reconstruction, the authors of the original study on disharmonic spellings just attest that their model "enlarges the number of vowels attested in Classic Maya times (cf. Kaufman and Norman 1984:85) and reflects conservative [i.e. pGT] elements in the language that were recorded hieroglyphically" (Houston, Stuart and Robertson 1998: 276-277). Applying pGT reflexes to the script seems methodologically dubious. If disharmonic spellings were indeed to indicate a complex vowel, one way to approach this question might be a comparison with spellings featuring Tzeltalan vernaculars. The reconstruction of the fairly contemporaneous pTz (Kaufman 1972) testifies a loss of long vowels already, a circumstance already used by Lacadena and Wichmann (2005a: 36) to (somehow vaguely) consider a Tzeltalan influence in Chinkultic via synharmonic spellings. Consequently, all Tzeltalan vernaculars should abrogate disharmonic spellings, although Lacadena and Wichmann (2005a: 36-38) cite disharmonic examples to potentially represent a Tzeltalan influence.

[110] For example the spelling of **UH-ti=ya** < *uht=iy* with the *CHUWEN*.SKULL sign SCH (Stuart and Houston 1994: 45-46) on TRT Mon. 6, I2, M1 (Gronemeyer 2006b: 151) to refer to Early Classic accounts in a Late Classic text. It is otherwise typical for the Early Classic (cf. TIK St. 31, B12).

[111] We may infer such instances from the distribution of positional affixation (Hruby 2002, Hruby and Child 2004). Even more impact to this question, as far as the showcases of this study are concerned have cases like the Eastern Ch'olan passive and mediopassive derivation as suggested by Lacadena for *chuk-k-aj* and *tz'ap-p-aj*.

2.5.3.3 – Sample and Data Base Constraints

The limitations from above potentially apply to all samples as the primer on a graphematic and linguistic level. There are more restrictions from an epigraphic and archaeological point of view, at least as far as the breakdown of the analysis to a spatial and chronological level is concerned. Not all of the samples can be tagged with a regional or temporal attribute (see Chapter 2.3.1.1), not even in a close approximation.

Especially portable artefacts like ceramic objects often lack an archaeologically secured context, and not all vessels have undergone physicochemical analyses to determine their origin and if no arguments can be made by style or content (e.g. Blackman and Bishop 2007, Reents-Budet, Bishop and MacLeod 1994, Rice 1982), no region will be attributed and these samples consequently fall short from the geographical distribution analysis. Lacking provenance is also a problem for monumental inscriptions, but these are more focused on historiography, and a region attribution is easier to reconstruct[112].

With even more potential to contaminate the provenance data is the character of portable objects, above all painted vessels, as trade items and wealth goods in a political context (cf. Rice 2009)[113]. If available, an archaeological context and provenance is therefore provided for the site in the database, but the regional attribution will be given with the likely origin of the text if there is firm evidence for relocation. The same is true for outsiders writing a text in their own fashion, like with the visitors at Naj Tunich. Therefore, some samples may remain with deviating spatial data.

A temporal assignment of a sample to a specific *K'atun* interval may equally be jeopardised by missing data from both the text and archaeological data. We can at least place the majority of monumental inscriptions between 8.12 (the earliest surviving Long Count from TIK St. 29) and 10.3 (the latest counterpart from TNA Mon. 158). Especially Terminal Classic and Early Post-Classic texts from Yucatan use calendrical notations different from the Long Count, such as the Short Count (Graña-Behrens 2002: 27-29). These dates not always result in an unequivocal reconstruction, but the secure ones at least prove an extension unto at least 11.3 (MPN St. 6). In any case, when no *K'atun* interval is determinable by non-calendrical criteria, none will be recorded and these examples fall apart the diachronic investigation of orthographic patterns.

Another concern can be made about the contemporary date of a monument, as it may not correlate with the time of production. This is especially a concern of sequential monuments in an architectural complex, such as the lintels of Yaxchilan Structures 23 (Mathews 1988: tab. 6.3) or 21 and 24 (Tate 1992: 129-130) that provide dates across several *K'atun*. A simultaneous production is likely, but

[112] See for example a corpus of possibly four inscriptions (COL St. Canberra, St. Saenz, P. Stokes and P. Berman) that all but the Saenz stela refer to the "captor of *Yax Ik'nal*", while two make reference to Bonampak and Yaxchilan. Therefore, Houston (1989: 17) located this "Site X" somewhere in the Usumacinta region (also see Bíró [2008: 279] for a re-evaluation, with COL St. Saenz likely from Laguna Perdida and different to the other three).

[113] Consider for example the well known case of an *Ik'* site vessel (Kerr 30177) from Motul de San José unearthed in Tamarindito Burial 6 (Foias 1996: 1140-1142, fig. C.22) as a heirloom, also considering the existence of other *Ik'* site vessels in Tamarindito and the Petexbatun (Gronemeyer 2013: 107, fn. 26). A different origin may not only be restricted to portable artefacts, a prominent monumental example is NAR HS. 1, supposedly coming from Caracol (Martin 2000: 57-58), with another fragment found in Ucanal (Graham 1978: 107).

cannot always be assumed, as monuments can be relocated (such as the lintels of Yaxchilan Structure 22 [Tate 1992: 128-129]). A case-by-case review is necessary, based on the archaeological evidence or epigraphic clues[114].

A real conundrum in terms of both origin and dating are the codices. The origin of the Dresden Codex was the Yucatan peninsula[115]. In terms of dating, there are numerous proposals, as 1200-1250 AD (Thompson 1972a: 15-16), not later than 1450 AD (Bricker and Bricker 1992) and after 1400 AD (Lacadena 1995: 362-363), so between 10.18 and about 11.10. Several workshops on the Madrid Codex (Vail et al. 2003) concluded that the manuscript originated from Yucatan[116]. By correlating some almanachs with astronomical data, the time frame of production[117] reaches from 1436 AD (Graff 1997) to some time after 1460 AD (Vail et al. 2003: 110), leaving a span between 11.10 and 11.12. There is general agreement that the Paris Codex originates from Mayapan or nearby (Love 1994: 9-13). Based on the *K'atun* pages (Treiber 1987), the dating is correlated to MPN St. 1 (Love 1994: 13), whose date can however be reconstructed as 10.18.0.0.0 (1185 AD) or 11.11.0.0.0 (1441 AD). The first alternative remains more likely though (Graña-Behrens 2002: 221, Schele and Mathews 1998: 367). The Grolier Codex will not be considered because of its lack of non-calendrical information, thus also avoiding the question of its authenticity (e.g. Milbrath 2007).

Another facet concerning the codices is as equally important as their time of production: following a suggestion by Grube (2001: I, 337), not only the Dresden Codex may be the copy of an earlier manuscript. Therefore, conservatism of older spelling patterns (and potentially those from a different region) may be considered for all codices upon a verbatim copying process (cf. Vail et al. [2003: 108], Wald [2004a] on the language of the codices), although editorial revisions are likewise possible[118].

[114] One example is the comparison between the contemporary date against numbered *K'atun* titles. While YAX Lnt. 32 bears the date 9.13.5.12.13, *Itzamnaj Bahlam* II is referred to as a 5-*K'atun-Ajaw*. But he must have achieved this count shortly before his death, as Lintel 23 associates his 2.5.0.0 jubilee in rulership on 9.14.14.8.1 with a 4-*K'atun-Ajaw* statement. Also see Mathews (1988: tab. 6.1) for an overview of his *K'atun* titles. Also, YAX Lnt. 33, the other monument associated with Structure 13, is devoted to *Yaxun Bahlam* IV. YAX Lnt. 32 is a retrospective monument, and was likely commissioned at about the same time as YAX Lnt. 33, dating to 9.15.16.1.6. This is a pre-accession event, and captive references in the titles of *Yaxun Bahlam* IV indicate a carving of this lintel in *K'atun* 16. Such discrepancies between date and dating also evoke the question of retrospective or contemporary linguistic / graphematic forms (see footnote 110).

[115] Paxton (1991: 307) suggests Chichen Itza, Mayapan, Tulum, Santa Rita Corozal, or possibly Kabah, while Coe (1989) suggests it was taken by Cortés on Cozumel. Most recently, Chuchiak (2012) suggested Champoton (the historic Chakanputun) as the place of origin by contextual evidence. The regional division set up (Chapter 2.5.4, Figure 13) has the peninsula divided into a 'Yucatan' and a 'Quintana Roo' region, but this separation is rather based on Classic period arguments, so 'Yucatan' is in any case decided as the region of provenance.

[116] As Chuchiak (2006) was able to conclusively demonstrate, the origin was somewhere around the town of Chancenote, near Tizimin. Although the regional division (Chapter 2.5.4) has this part attributed to 'Quintana Roo' already, 'Yucatan' will be the region for the Madrid Codex (as argued for the Dresden Codex).

[117] It is consensus that the appearance of the *Bula de la Santa Cruzada*, roughly dating between 1575 and 1607 AD was a later addition to sanctify the manuscript – proof that it was still in use by that time (Chuchiak 2006, Vail et al. 2003: 108, 111).

[118] With just four manuscripts surviving, a text tradition is hardly assessable. Although there are some similarities among the almanachs (e.g. C Dr. 38b-41b and C Ma. 10a-13a), no archetype can be reconstructed. In fact, differences may originate from local traditions. Despite conservatism, a copyist can still have reinterpreted a linguistic form or spelling, especially in the diglossia situation (Bricker 2000b) of primarily Ch'olan codices in the area of spoken Yukatek. The question remains of how much liberty a scribe had to vary the content of an almanac. Also contrast the sometimes error-prone copies of early Biblical texts (e.g. Head [2004] on Oxyrhynchus

The codices in many respects constitute a special case among the sources and their methodological treatment. While the manuscripts can be regionally assigned to Yucatan and included in a spatial review of spelling patterns among the other samples, the temporal perspective is less clear. As there are also very little samples available from the Postclassic, a *K'atun* interval comparison would not yield sufficient corresponding data. It is likely most conducive for the analysis to consider each codex as a closed group and compare the orthographical practices of each manuscript with the others first.

Thus, when dealing with the temporal and spatial questions of spelling schemes, the analyses for them need to manage on a lesser data basis than the general questions. Nevertheless, for the sake of roughly positioning the codices on the timeline, a mean value is taken from the date range, providing 10.18 (C Pa.), 11.04 (C Dr.) and 11.11 (C Ma.).

2.5.4 – Time and Space

As frequently mentioned in the previous chapters, any linguistically or graphematically determined set of samples can as well be reviewed from a (language) geographic or diachronic point of view. This chapter determines the criteria for the definition of the regions and time periods.

Regional demarcations can be defined by a variety of features which all would provide a good reason to set the borders. The analytical regions are supposed to provide a sufficient subdivision of the Maya area for the analysis to subsume common peculiarities in language and therefore hieroglyphic writing as its reflection. This division can only be as accurate as the current state of research allows, but the plotting of the regions is also intimately connected to the question what factors influence the distribution of dialects and languages. Also, what would be the linguistic variables[119] to trace such isolines? The problem is to arrive at a generally acceptable definition for the Maya area that not only considers the distribution of certain grammatological features in a synchronic way (although desirable for a detailed review), but is as consistent as possible in a diachronic perspective.

We would not only seek the expansion of linguistic features, but also the distribution of spelling patterns. This is not a dichotomy, as orthographical realisations reflect the underlying language. This for example is plain for the positional suffixes (Hruby 2002, Hruby and Child 2004), as *–wan* and *–laj* require a different selection of graphemes. But it gets more evident with the spellings of **chu-ku-ka=ja**

papyri) with the obligations of a Jewish *sofer* (Mills 1996). Especially the Madrid Codex exhibits a negligence of proper block arrangements, sign transpositions within a block (e.g. **ku-mu-u** < *u-muk-u-Ø*, C Ma. 109b2), a greater liberty in writing style (e.g. Vail 2000: 48) and clear errors (e.g. **KAB[na]-CH'EN[ba]**, C Ma. 90a2). This can never be monocausal, and the reasons may range from individual disabilities, the loss of understanding Ch'olan in Yucatan (Houston, Robertson and Stuart 2000: fn. 6) up to systemic changes in the writing tradition. One emanation, as outlined by Fairman (1945: 55-57) for Ptolemaic writing, are reading alterations and an increasing sign inventory. This of course leaves the epigrapher with several problems in understanding the codices and assess their orthography and language, as the codices feature some novel graphemes as well.

[119] A methodology used in dialectal research is the processing of phonological data by an algorithm to determine the Levenshtein distance (cf. Heeringa [2004] for some application possibilities) of words. The method could potentially be adapted to comply with graphematic premises, specifically those of a morpho-syllabic system. This would enable epigraphy to compute statistical distances between spellings and eventually correlate them with linguistic data to trace isoglosses.

and **tz'a-pa=pa=aj** cited above (footnote 82) and their implications; or the assumed diminishing of the harmony rules as a potential reflect of the supposed loss of complex vowels in Ch'olan languages (footnote 109). If a closer approximation of the Classic Mayan language(s) by examining the orthographic patterns is possible, one would like to compare the distribution of linguistic with grammatological features. A similar study has been conducted by Rollston (2006) on Old Hebrew, and to describe the graphematic distributions, he has proposed the term *isograph*. Ideally, isoglosses and isographs would show close matches.

However, the Classic Mayan language is not necessarily and directly reflecting the spoken reality, as it preserves fossilised forms from a primary Ch'olan context (see Chapter 1.2.2.3). Only occasionally, vernaculars are surfacing, possibly also depending on the genre[120] (see footnote 290). Specific traits of the underlying language (not only in terms of morphology) may be represented, but are not homogenous and be may mixed with Ch'olan features[121] (cf. Lacadena 2000b).

[120] Another facet to be considered about different genres is their style and rhetorics (cf. Lacadena 2009). The style between historiographic monuments and the almanacs of the codices is already very dissimilar. Metaphorical language adds another level of complexity, as several of the manuscripts from Colonial Yucatan demonstrate, e.g. the *Ritual de los Bacabes* (Arzápolo Marín 1987) or the riddles from the 'Language of *Zuyua*' in the *Chilam Balam* of Chumayel (e.g. Stross [1983] who assumes a Mije-Soke substratum). When we assume that complex narratives of mythological content were once recorded in Classic codices and ceramic artefacts, vernaculars may even be of bigger concern to the epigrapher (cf. Hull [2009a] on CHR ritual language). Indeed, we have a couple of ceramics that obviously refer to mythological events by the accompanying iconography, e.g. K1440 and K6020. The texts of both vessels have thus far resisted a comprehensive analysis (apart from the occasional identification of short passages), although most signs are deciphered, thus the text should at least be able to transliterate. The appearance of the quotative particle *chehen ~ che'en* (Grube 1998a) in such texts points to (indirect) spoken language that may contain forms unfamiliar to the epigrapher. These may or may not be the result of vernacular influence, but genre-specific, in an case the text is not uncoupled from the underlying morphosyntax indicative for ClM.

[121] The kind of amalgamation is intimately tied to the question what linguistic aspects have to be considered: phonology, the lexicon, morphology and morphosyntax or their combination. When I for example consider the spelling **u=CHOK-CHAJ^{ji}** on TNA Mons. 7 and 104 as evidence for a Tzeltalan root transitive inflection (see footnote 315), neither *chok* nor *ch'aj* have a lexical counterpart with the same phonology in Tzeltalan. Can we therefore consider a Tzeltalan morphology, either for a root transitive inflection or with a perfect suffix as Lacadena and Wichmann (Lacadena and Wichmann 2005a: 36) did? When the same root is attested in different branches, language-specific inflections represent this situation of diglossia, e.g. ClM **jo-ch'o u=k'a-k'a** < *[u-]joch'-o-Ø u-k'a[h]k'* (C Dr. 6b1) versus pYu **u=jo-ch'a u=k'a-k'a** < *u-joch'-a[j]-Ø u-k'a[h]k'* (C Dr. 6b2), "he drills his fire" and pYu **jo-ch'o=bi=ya u=k'a-k'a** < *joch'-b-Ø=iy u-k'a[h]k'* (CHN CC-HB, 13-14), "after his fire was drilled". The latter example, discussed by Lacadena and Wichmann (2002: 283-284) represents the proto-Yukatekan passive **–(a)b* (Table 7). Not discussed is the *–iy* suffix which appears to be the temporal deictic enclitic discussed by Wald (2000, 2004b), unless the **ya** sign has not been re-interpreted in a Yukatek vernacular context to reinforce the final *–i* / __# of the completive aspect marker (which already would be contained in the **bi** sign alone). I tend to consider the enclitic, as blocks 5-6 analogously mentions *joch-[a]j-Ø=iy u-k'a[h]k'* in ClM passive morphology. The enclitic *–iy* may be used to refer to an earlier event not mentioned in the text itself (Wald 2004b: 223-224). If a morphemic compound (i.e. a lexeme plus affixes) of one language can already appear side by side with those of another language in one text, who can exclude the possibility that this will not happen within a morphemic unit? An expression like *chok-ch'aj* was surely understood well enough to receive a Tzeltalan inflection. This sheds light from an entirely new angle on vernacular influences in Maya writing. We may distinguish 'narrow' vernaculars from 'broad' cases that almost can be considered as 'creolisation' (at least in writing) in an environment that was bilingual with varying degrees (cf. Hofling [2000] for some discussion) in spoken and written word. For example, also refer to the case studies on such code-mixing by Michael Clyne on German and Dutch immigration communities in Australia, e.g. with *[t]hat's what Papschi mein-s to say*, where German *meinen*, "to mean, think, deem, reckon" is used because of its close phonology and semantics, but inflected as an English word (cf. Muysken 2004: 11-12). Another case concerns the situation in Namibia with the today dying *Kiche Duits* (Deumert 2009) adopted by indigenous language groups and developed in missionary schools as well as in work / trade situations; initially from the German colonists, but later including influences from Afrikaans

The best geographic data existing for the Maya area originate from Wichmann (2006a, Figure 2) who mapped the distribution of vernacular features. For the definition of the areas in this study (Figure 14), his borders for the extent of Yukatekan and Eastern Ch'olan were taken. Interestingly, sections of Wichmann's Eastern Ch'olan isogloss / isograph show similarities with the border of the drainage basins (*cuencas*) of the rivers, as defined by the *Atlas Arqueológico* (cf. Escobedo 2008: fig. 3), at least in the Guatemalan lowlands. As hydrographical and geomorphologic features seem to be a natural factor influencing the spread of language and writing, Figure 14 combines both epigraphic and linguistic evidence with natural features to define the regions.

Certainly, other demarcations might be possible, for example by political organisation. Territories of or alliances between city states (Grube 2000a, Grube and Martin 1998, Marcus 1973, 1976, Martin and Grube 1994, 1995, Mathews 1991) are however too versatile over time to be a general factor. In a synchronic perspective however, the political nexus of relationships might be a revealing factor for linguistics and graphematics. As it has been pointed out by Martin and Grube (cf. Gronemeyer 2012: 19-20, 29), Dos Pilas used a different allograph of the *mutul* emblem glyph from the times of Ruler 3 on, certainly in seeking delineation to the line in Tikal. Besides such cases of reason of state, other differences in orthographic patterns might be traceable, including the reflection of contrasting linguistic features[122] or the preferences of a certain scribal school[123].

By the assignment of each sample to a specific *K'atun* period (sample parameter 3c), a sufficient level of detail is reached to trace the emergence, development and prevalence of orthographic patterns from a diachronic perspective. The objective is less to obtain a distribution for the principal periods of Maya history (Late Pre-Classic, Early Classic, Late Classic, etc.), as these are rather archaeologically

when the South African protectorate was established. Contrary, the *Südwesterdeutsch* variety spoken by today's German-speaking minority, is moderately influenced by English and Afrikaans in lexicon and grammar, with only few borrowings from Otjiherero and Khoekhoe. For example, future tense is formed with *gehen* + verb, instead of Standard German *werden* (cf. Deumert 2009: 359-360). This may result from English "going to" constructions, but also from Afrikaans *gaan*, compare "we are going to visit someone" as *wir gehen kuiern* with Afrikaans *ons gaan kuiern* (Natalie Renkhoff, written communication April 3, 2013). A recently developed lexical calque is *basisch* from "basic" with a German adjectival stem formative, used instead of *grundsätzlich / grundlegend* (Natalie Renkhoff, written communication March 27, 2013; note that Standard German *basisch* has the meaning "alkaline"), e.g. *basische Informationen*, "basic information". Also refer to Chapter 3.2.1 for additional considerations.

[122] This would rather argue to model geographic regions after the actual epigraphic data – after the analysis – instead of pre-empting them to the data. However, assuming a tendency towards uniformity, the differences may not be sufficient to define regions after the data. On the contrary, certain samples that have been attributed to a specific region may appear as outliers in the analysis because of individual patterns not represented otherwise. A reclassification to another geographic region could solve the problem and may ultimately help to better model isoglosses, isographs or regions.

[123] Lacadena (2008b: 1, 18) for example considers Chichen Itza to represent its own scribal school, determined by the heavy use of syllabograms and the disrespect of glyph blocks as the usual delimiter of a morphemic compound (word). It is problematic to define a 'scribal school' or 'workshop', which either is a single scribe/artist or a group of people. The range of production may be limited (unless portable objects are concerned), but may eventually lead to a tradition not only on a local basis. Krempel and Matteo (2012) present a methodology how to define painting styles on ceramics, including the elaboration of hieroglyphic texts and their orthographic peculiarities. More on a micro-scale, towards individual handwriting, are the investigations by Van Stone (2005) on Palenque during the reign of *Kan Bahlam* and Montgomery (1995) on Piedras Negras for Ruler 7. Such considerations may, complementing the statistical analysis, help to identify certain 'schools', even in a spatial view or with geographically dispersed objects.

and culturally determined (Houston and Inomata 2009: 15-17, Sabloff 1985: tab. 2.1, Sharer 1994) and too arbitrary for a grammatological investigation.

Figure 14: The geographical regions for sample attribute 2d according to epigraphically attested vernacular borders and hydrographical and geomorphologic features. Height relief by Shuttle Radar Topography Mission (SRTM), PIA03364, courtesy NASA/JPL-Caltech. Sven Gronemeyer, with region demarcations inferred after Wichmann (2006a: fig. 1), INSIVUMEH Atlas Hidrográfico and INEGI Red Hidrográfica.

The timeline shall rather anchor certain milestones in the development of Maya writing and the Classic Mayan language. With the discovery of the San Bartolo murals (Houston 2006, Saturno, Stuart and Beltrán 2006), we can date the emergence of hieroglyphic writing in the Maya lowlands back into the Late Pre-Classic or Cycle 7.

Further texts from these times and the first half of *Bak'tun* 8 are known from small artefacts (cf. Grube and Martin 2001) or stone inscriptions (e.g. the Hauberg Stela, cf. Schele [1985b], Schele, Mathews and Lounsbury [1990]), although without necessarily a firm attribution to any *K'atun* within. The dating gets on firmer grounds with the first Long Count dates, and the number of inscriptions suddenly increases from around 8.16 on (cf. Grube and Martin [2001: 3] for a tabulation of the amount of dates from each interval).

While the paucity of inscriptions from the dawn of Maya hieroglyphic writing allows only limited conclusion about the development of orthographic patterns, we can investigate the first appearances of syllabic signs in writing, specifically to spell out grammatical suffixes. Although the important instance of the prefixed ergative pronouns (Grube 1990a: 50, 80) is not covered by the thesis showcases, the breakdown of orthographic patterns for suffixes into spelling groups (Chapter 2.2.2) and schemes is also able to trace the emergence of phoneticism. This culminates in the question when we actually see the first examples of fully integrative, vowel-providing spellings and their position in time relative to non-integrative ones.

Even more, by the correlation with the suffix function, it becomes possible to determine the morphophonemic environment under which a certain spelling type emerged. Tying this to a specific region, language geography provides further arguments. Some of the suffix functions, reflecting a developmental step of a language recorded in the inscriptions and/or a vernacular feature, allow a more precise dating of these phenomena for historical linguistics. With the same combination of attributes, other milestones can be located in the historical development of Maya writing, such as the first appearance of synharmonic and disharmonic patterns as the supposed 'regular' way of writing or as an indicator of a breakdown of traditional spelling rules.

While many fields of Maya studies already attested its cultural, regional and temporal diversity (Sharer 1994: 63), the very same perception for linguistics and epigraphy only recently emerged with an exponentially growing knowledge of its dynamics. It is hoped that by the methodology of this study, especially by the selection of linguistic showcases, the definition of epigraphic spelling patterns and the interpretational framework, Maya hieroglyphic orthography and the phoneticism backing it up will become clearer.

3 – Hypotheses and Analyses

"It is a capital mistake to theorize before you have all the evidence. It biases the judgment."
Sir Arthur Conan Doyle, 1888: A Study in Scarlet, Part I, Chapter 3

Although Sherlock Holmes is giving a wise counsel, a working hypothesis is an apt starting point and a thorough methodology will provide a ramification to premature pre-assumption. And can we ever be sure to have all evidence? With a methodologically guided and stringent analysis, the data can be tested against a hypothesis and either prove or disprove it. And in the latter case, the analysis and the evidence retrieved may allow to formulate different objectives. The goal remains the same: to gain a better understanding of Maya hieroglyphic spelling practices. In that sense, I gently have to extenuate that "hieroglyphic data will never contribute as much to Mayan historical linguistics as it receives" (Justeson 1985: 471), but agree the glyphs have "great importance both for tracking the historical development of the represented language and for appraising both the results of historical linguistics and comparative linguistics" (Wald 2007: 18). Fox and Justeson (1980) already proved the mutual importance of epigraphy and linguistics. With the thesis, I would also give something back to linguistics with the orthographic implications for the reconstruction of the Classic Mayan language – if possible.

Before I can achieve this, I will first have to lay out the linguistic evidence, from both Colonial and modern sources. The hypotheses also need to rely on the results of historical linguistics which need to be put on the test stand again. With the linguistic evidence, I can then turn to epigraphy and propose forms to be found in the hieroglyphic inscriptions. Finally, the epigraphic data can be tested against these assumptions, specifically in considering those spelling patterns that would provide unambiguous phonemic confirmation with regards to the thesis topic.

3.1 – Hypotheses

The following chapters provide the linguistic data for each showcase and suffix function (as per Chapters 2.1 and 2.5.1). Contrasting the cognates, allomorphs, morphophonemics and phonology of the relevant Mayan languages sets the frame for the comparative reconstruction of the form(s) for Classic Mayan and the vernaculars influencing it. The original orthography from the source is retained in the tables and explanations[124], although gentle adaptations to the general format in the thesis are made (especially regarding morphological segmentation). The description will

[124] This of course impedes easy comparison of different sources or between languages, especially as the phonology of suffixes is concerned. Each source applies its own orthography, which can be oriented after the Spanish alphabet (as applied in the present thesis, see Tables 1 and 2) or be phonemic – or a merger between them. Especially the letter /x/ is concerned, which either stands for [ʃ] or phonemically for [x].

be standardised as far as possible, but at the same time it seeks to reflect the original explanation, unless the source gives no evidence for the morphological embedding. Colonial sources are listed first for each language, and generally a phonological grouping of forms is sought.

The table for each language group is accompanied by a short synthesis of the forms. As the primary focus is on the compilation of the forms and their comparison, discussions on the underlying phenomena (e.g. the historical development) can only be tangled. They will only be intensified under two circumstances:

(1) *Descriptive absence*: The postulation of a certain ClM phonological or morphological form requires background information. This is especially true for morphosyntactic features that hitherto have been disregarded to a larger extant. For example, voice and ergativity have demanded much attention in both grammars and dedicated studies. But other aspects, like the adjectival derivation, lack a strong examination in the literature. This is both a quantitative and a qualitative issue: certain phenomena may not have been described at all for a certain language and if, linguistic standards may not be met.

(2) *Linguistic absence*: A morphosyntactic form / function reconstructed for ClM does not find reflexes or cognates in the relevant Colonial or modern languages. Here, the scope needs to be broadened to other branches of the Mayan languages. Likewise, the epigraphic evidence has a much greater influence on the postulate, and analogous cases from linguistic studies possibly need to be attributed to the case made. Examples for this aspect are the absolutive noun marker or the development of the antipassive.

In both of these cases, historical linguistics and lexical / contextual data mining play a much greater role than the sole reliance on grammatical studies. Therefore, the linguistic evidence presented fluctuates much in its extent, but this must not be taken as an argument not to arrive at a spelling hypothesis to be tested against the epigraphic evidence[125]. In most cases, predictions for specific spelling patterns (per genetic subdivision) can be made based on the linguistic evidence[126].

The gathering of linguistic data and the formulation of the hypothesis is an important pivot in this study. It operates on a thin red line. It looks to confirm and stick to the showcase definitions made in Chapter 2.1, but cannot neglect linguistic evidence that eventually may alter or diversify them. This is in fact a desirable result. This study is not seeking mere confirmation for the current state of research, but pursues to gain a more in-depth understanding. In the end, the linguistic evidence and the resulting hypothesis formulation are expected to deny or alter previous assumptions and add new ones. This may result in diverging phonological patterns contrasting the showcase definitions. Within

[125] Especially when considering the second aspect of missing cognates, we may face the ramification to arrive at a circular argument when taking epigraphic evidence into account. However, epigraphy shall more clarify on the morphosyntax than on the actual vocalisation of the suffix in question. Still, this deductive process bears some dangers, as for example the question of instrumental formation in the inscriptions (see footnote 431) demonstrates.

[126] Forms already securely identified in the hieroglyphs are unmarked, an asterisk marks epigraphically unattested forms solely based on the linguistics, an asterisk in brackets signifies potential, but insecure attestations in the hieroglyphic record. The latter case especially concerns spellings in the context of a spoken vernacular identical to those of ClM, where a distinction to a written vernacular is hardly assessable.

the given frame of the original showcase outline, this new evidence is included with the one confirming the current state of research and which altogether is utilised to find corresponding hieroglyphic forms. Without a proper understanding of the underlying linguistics, it would be rather futile to look for hieroglyphic attestations. The evidence gathered in the data base can then be used for further support within the analyses and discussions and ultimately contribute to a new and hopefully better understanding of the orthographic conventions in Maya writing and the linguistic foundations that make them necessary.

3.1.1 – Test Group 1

3.1.1.1 – Passive Thematic *–aj* ~ *–C-aj* ~ *–j* and Mediopassive Suffix *–C-aj*

Ch'olan languages feature manifold ways and forms of passive formation (Table 6), so it is problematic to include them all for a comparison with Classic Mayan (Kaufman and Norman 1984: 108). The greatest consistency of forms appears among ECh with a derivational *<*j*> (to be reconstructed for CHT) and a thematic *–a*, which at least in CHT intervocalic position was **–aj* (Kaufman and Norman 1984: 108). Among some intransitivations, CHT and CHR have a morphophonemically conditioned *–i* as the thematic suffix (especially among antipassives)[127], both emerging from pGT **–aj* and **–ij* intransitivising suffixes (Kaufman and Norman 1984: 104-105)[128]. The suffix is eventually followed by an

[127] The CHT 'middle voice' *–{s, x}-i* (Sattler 2004: 378) in fact has rather to be considered as an antipassive, as the example of <*Pacxiel*> (**pak-x-i-el* as 'return-ANTIP-THEM-INC-3SG.ABS'), "bolber de alg.ª parte" (Morán 1685-95: 91) shows. The same form attested as a completive antipassive in hieroglyphic writing with **pa-ka=xi** < *pak-x-i(j)* (NTN Dwg. 48, A1 [MacLeod and Stone 1994: 178]), possibly as a contraction of ***pak-x-i-i-Ø* or ***pak-x-i-Ø-Ø* as 'return-ANTIP-THEM-COM-3SG.ABS' (cf. Kaufman and Norman [1984: 104] for the ECh zero completive marker in such environments). Compare to the process with the subjunctive status marker *–ik* as in <*xpacxicen*> (*x-pak-x-i-k-en* as 'FUT-return-ANTIP-THEM-SUB-1SG.ABS'), "I will return" (Morán 1685-95: 20). Also refer to footnote 45. As Sattler (2004: 378) cites other 'mediopassive' derivations with a *–C-{a,i}* scheme, it becomes apparent that the vowel following the derivational suffix is in fact a thematic suffix which is morphophonemically conditioned by the preceding intransitiviser. Apart from *–s* and *–x*, more of Sattler's 'middle voice' suffixes can be considered as antipassives rather, as for example *–m* (see footnote 136 for the rationale). If we equate the CHT *–a* thematic of passive and mediopassive derivations with ClM *–aj*, then we may wonder if a spelling like **pa-ka=xi** may be an underspelling of a potential ***–ij* thematic, or if such examples are already CHT vernacular, thus omitting a final velar fricative. However, we also find spellings of **pa-ka=xa** (e.g. NTN Dwg. 65, B2), which show parallels to intransitivised spellings found on CPN St. J (see footnote 148). This may either indicate allomorphs *–x-i(j)* ~ *–x-a(j)* or just *–ax* (see footnote 654). The morphological and functional ambiguity of these suffixes must also be viewed with the background of diatheses and the understanding of 'anticausative' forms in Mayan languages (see Chapter 3.1.4.1 and especially footnote 361).

[128] Houston, Robertson and Stuart (2000: 330, 333) contradict Kaufman and Norman, as they view the ECh passive as an innovation from the GTz *<*h*>*…-aj* root positional marking (see also Chapter 3.1.1.2). This becomes also significant with the CHN and CHL passive formation (see footnotes 129 and 130). As the thesis cannot provide a full discussion on the topic, only a brief consideration is provided which might provide some bridging between the two positions. Out of a positional stem (e.g. *chum*, "sit"), several derivations can be made, e.g. by *–Vl* to form a stative predicate (Houston, Robertson and Stuart 2000: 329, tab. 2) or positional adjective (i.e. **chum-ul*, "sitting"). For pTz, an intransitiviser **–Vj* is reconstructed for various roots, but specifically **[h]…-aj* as the intransitivation paradigm of a positional stem (Kaufman 1972: 141), both inherited from pGT. At this stage I suspect **–aj* to function as the derivational morpheme that found its reflex in the change of the stem vowel complexity (i.e. **chu[h]m-aj*, "to sit"). Only later got the derivational morpheme interpreted as a thematic suffix that became independent from the infixed <h>. This may not have happened before the split of pCh into WCh and ECh, or at least very late in the pCh development, as we have it among the primary passiva-

aspect marker. The same derivational infix as in ECh is still in use for CHL root transitives not ending on a fricative, otherwise CHL uses the same suffixes as for the positional marker (Robertson 2010: 6-7)[129]. The infix can be reconstructed to *<*h*> in WCh (Kaufman and Norman 1984: fn. 11) and pCh.

The passivation process in CHN has not yet satisfactorily been solved (Kaufman and Norman 1984: 108), its apparently constant derivation by *–k* appears very unfamiliar when compared with the root transitive derivation among the other three languages. Modern CHN still shows the same pattern though, and it may be considered an innovation (Lacadena 2004b: 172). If CHN is indeed much closer to ECh (Houston, Robertson and Stuart 2000: fn. 2), its passive might have been influenced by a *–C-a-* middle voice derivation of ECh.

No thematic suffix has been described for CHL or CHN, although *–i* might represent it[130]. The mediopassive derivations described for CHT and CHR have received several denominations in the

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tion in ClM. The ablaut change of the stem vowel became the derivational infix. The function as a thematic suffix is evident from ECh, where the derivation of the passive from derived transitives and the mediopassive is achieved by a consonantal suffix. The pTz and pGT **–aj* and **–ij* intransitivising suffixes may even further reach back before the furcation into pGQ, as the passive derivation for CT and Qa (Table 9) show (also retaining other pM intransitivisers). For pM, Kaufman (Mora-Marín 2005b: 34) proposed an **–aj* mediopassiviser of derived transitives (together with **–h-* for root VER.TR [Kaufman 1994, A 4a: 45-46]) as an alternative reconstruction to the positional origin. The reflex of this suffix might continue in the CHL *–ij ~ –uj* antipassive derivation (Mora-Marín 2009: 136-137) and be related to the **–Vj* general intransitivisers.

[129] Robertson's interpretation concurs with earlier hypotheses on morphological shifts (Houston, Robertson and Stuart 2000: 331-334, fig. 4) from pM to ClM. He considers the proximity of TZE as a trigger for the shift in CHL (Robertson 2010: 7). It is phonemically induced by the derivational infix to be elided before fricative codas, therefore CHL utilises the positional suffixes as root transitive derivation morphemes. Contrary, and in supporting Kaufman and Norman (1984: 107) in their pCh positional marking, Mora-Marín (2005b: 69, fn. 30) takes the reverse position in that CHL positional marking was influenced by the passive. A discussion of this problem again lies well beyond the thesis' scope. In any case: following Robertson regarding the extinction of a derivational morpheme in a phonological process would also provide support for the other way – the genesis of a derivational infix out of a morphophonemically conditioned change of a root vowel, as proposed for the pTz root positional marking (footnote 128).

[130] It is to question whether the CHL and CHN *–i* / __# appearing in the completive among root and derived transitive passivation is a genuine aspect marker as described for root intransitives (Smailus 1975: 196) or a thematic suffix. It could as well be explained as a fossilised form from the pTz and pCh thematic suffix **–i(j)* ~ * *–a(j)* of derived intransitives (Kaufman and Norman 1984: 104-105), only still visible as a portmanteau form with the completive aspect marker and the 3SG.ABS *–Ø* to follow, otherwise it is elided. This would be a theoretical scenario as evoked by Kaufman and Norman. The thematic *–i* is retained in CHT and CHR with derived intransitives (Kaufman and Norman 1984: 104-105), to appear between the derivation morpheme and status marker, see the examples in footnote 127. Its contraction is attested for the ECh in certain contexts with vowel initial suffixes to follow, e.g. CHR *nijke'n* < **nijk-i-en* as 'fall-THEM-IMP', the glottalisation of the imperative is the morphophonemic result of the process. Together with the evidence from footnote 127, CHN <*chucci*> (Smailus 1975: 195) could be analysed as **chuk-k-i-i-Ø* or **chuk-k-i-Ø-Ø*, 'take-PASS-THEM-COM-3SG.ABS'. Further evidence may be coming from the glyphic spelling **chu-ku=ka=ja**, if one follows Lacadena's (2004b: fn. 101) consideration that this form represents a CHN vernacular. The sequence **ka=ja** would therefore provide the derivational suffix plus the otherwise well attested thematic suffix as *–k-aj*. In hieroglyphic writing, both **–ij* and **–aj* might still have existed, while Acalan and modern CHN only preserved *–i* (assuming that the texts were generally written in the completive aspect, see Chapter 1.2.2.2); and *–aj* was chosen to concur with the apparently prevalent *<*h*>*…-aj* pattern of ECh. On the other hand, MacLeod (1987: 64) also quotes a *–k-a* passive in CHN. The glyphic evidence is weak, though (see footnote 82). Two examples of this spelling are known, the one on YAX HS. 3, Step I Tread, C6y would lie very well outside the CHN area and could be a simple overspelling, the one from PAL SLAV, E2a is much more likely to represent a CHN vernacular, although it still might be an overspelling. Although a plain scheme 1.b.i spelling, **CHOK-ka-ja** (UAX St. 12, A4) could be interpreted in two ways, depending on how one views the **ka** sign. As a phonemic complement to provide the suffix vowel, the spelling **CHOK^{ka}=ja** gives an ECh and thus typical ClM passive *cho*<*h*>*k-aj* – if it is considered as a grammatical morpheme, **CHOK=ka=ja** can be taken as a CHN *chok-k-aj* vernacular (but unlikely with the example coming from

literature (such as celeritive, resultative, etc.) to emphasise their semantics. In both languages, and reconstructed for ECh and pCh, they very uniformly adhere to a ***–*C-a(j)* pattern. Especially ECh features strong evidence for the vocalisation of the glyphic *–aj* suffix, both for the passive (Lacadena 2004b), but also some mediopassive forms (Beliaev and Davletshin 2003, Lacadena 2004b: fn. 101).

Idiom	**Attestations**		**Sources**
pCh	**<h>…-aj*	PASS < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	**-nt-aj ~ *-n-aj*	PASS < VER.TR.D	(Kaufman and Norman 1984: 109)
pCh	**-p-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	**-tz'-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	**-k'-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
ECh	**-n-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 157)
ECh	**-p-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 161-162)
ECh	**-tz'-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 160-161)[131]
ECh	**-k'-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 159-160)
ECh	**-t-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 158-159)[132]
CHT	*CV[h]C-a*	PASS < VER.TR.R	(Kaufman 1994, A 4a: 45)
CHT	*<*j>…-a-l*	PASS < VER.TR.R [+INC]	(Kaufman and Norman 1984: 108)
CHT	*<*j>…-a-l*	PASS < VER.TR.R [+INC]	(Sattler 2004: 370, 378)
CHT	*<h>…-a-l*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 8)
CHT	*<*j>…-a*	PASS < VER.TR.R [+COM]	(Kaufman and Norman 1984: 108)
CHT	*<*j>…-a*	PASS < VER.TR.R [+COM]	(Sattler 2004: 370, 378)
CHT	*<h>…-a*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 8)
CHT	*<h>…-a(h)*	PASS < VER.TR.R	(Robertson, Law and Haertel 2010: 163)
CHT	*<*j>…-a-k*	PASS < VER.TR.R [+SBJV]	(Kaufman and Norman 1984: 108)
CHT	*<*j>…-a-k*	PASS < VER.TR.R [+SBJV]	(Sattler 2004: 370, 378)
CHT	*?-n]a[h]*	PASS < VER.TR.D	(Kaufman 1994, A 4a: 46)
CHT	*-n-a(h)-el*	PASS < VER.TR.D [+INC]	(Kaufman and Norman 1984: 108)
CHT	*-n-a(h)-el*	PASS < VER.TR.D [+INC]	(Sattler 2004: 377)
CHT	*-n-a*	PASS < VER.TR.D [+COM]	(Sattler 2004: 377)
CHT	*-n-a(h)*	PASS < VER.TR.D	(Robertson, Law and Haertel 2010: 163)
CHT	*-n-a-k*	PASS < VER.TR.D [+SBJV]	(Sattler 2004: 377)
CHT	*-p-a*	MED < VER.TR	(Sattler 2004: 377)[133]
CHT	*-p-a(h)*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHT	*-pa(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-m-a-*	HAB < VER.TR	(Fought 1984: 55)[134]

La Corona, although it is located on the Western fringes of the Central Lowlands). Such evidence, especially when there are morphemes possible that include the same consonant as the root coda, requires careful interpretation against its provenance and dating.

[131] What Storniolo terms change of state mediopassives are considered as celeritives by Kaufman and Norman (1984: 109). These should be reflexes of pCh intransitivising suffixes on **–C-{i, u}j*, which also appear in pTz (Table 13) as celeritives from transitives and positionals. While the pCh forms are not specified in the original study, I consider them as celeritives as well, as they have to be of a pGT origin by their pTz cognates. Therefore, the passivation described via *–tz'* in CHT and CHR is surely done in error.

[132] Several authors (e.g. Dayley 1990: 372, Fought 1967: 202) call this a "resultative" suffix, showing the result of a change of state, e.g. *ab'ac'ta*, "he is afraid" < *b'ac'*, "to fear" (Oakley 1966: 244). Thus, this 'resultative' form can also be considered as a mediopassive in the broader sense.

[133] The CHT 'passive' on *–p-a* provides some problem not satisfactorily solved in the literature. Fought (1984: 54) considers it as a reflexive suffix, exactly as in CHR. There, it can clearly be identified as a mediopassive, as an intransitivation where "[t]he subject acts upon itself" (Fought 1967: 206). Its use in Morán (1685-95) leaves a blurred picture. It appears (cf. Sattler 2004: 377, 378) with non-CVC transitives as in the following example: *<ucana P.[e] xilpac misa camenel>* (**x-il-p-a-k-Ø*, 'FUT-see-MED-THEM-SUBJ-3SG.ABS'), "quiere el Padre que sea la misa vista por nosotros que veamos misa – tambien se puede desir xilac aunque no esta en uso." It is also attested with regular root transitives, e.g. *<cha[c]hpaet tia umenelob Judios>* (**ch'ak-p-a-et*, 'beat-MED-THEM-2SG.ABS'), "you were beaten by the Jews." While considered to be a passive (Sattler 2004: 377), it is also analysed among other *–C-{a, i}-* mediopassives (Sattler 2004: 378). I concur with the latest analysis by comparison with CHR (Wichmann 1999) that *–p-a* is actually most likely to be considered as a mediopassive derivation.

CHT	*-¢'-a(h)*	PASS < VER.TR.R	(MacLeod 1987: fig. 8)
CHT	*-tz'a(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-c'-a-*	MED < VER.TR	(Fought 1984: 55)
CHT	*-k'-a(h)*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHT	*-k'a(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-t-a-*	MED < VER.TR	(Sattler 2004: 378)
CHR	*<j>*	PASS < VER.TR.R (capability)	(Dayley 1990: 372)
CHR	*<h>…-a*	PASS < VER.TR.R	(del Moral 1988: 415)
CHR	*<j>…-a*	PASS < VER.TR.R	(Ch'orti' 2004: 138, 208-209)[135]
CHR	*<j>…-a*	PASS < VER.TR /CVC	(Wichmann 1999: 60)
CHR	*CV[j]C-a*	PASS < VER.TR.R	(Kaufman 1994, A 4a: 45)
CHR	*<h>*	PASS < VER.TR.R,PART (few)	(Oakley 1966: 245)
CHR	*<h>…-a*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 8)
CHR	*<h>…-a*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 8)
CHR	*<h>…-a-Vk*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 8)
CHR	*√H A*	POT < VER.TR /{I/,E/-class}	(Fought 1967: 194)
CHR	*√NA*	subjective	(Fought 1967: 219-221)
CHR	*?-n]a*	PASS < VER.TR.D	(Kaufman 1994, A 4a: 46)
CHR	*-na*	PASS < VER.TR.D	(Oakley 1966: 244)
CHR	*-n-a ~ -m-a*	PASS < VER.TR.D	(Ch'orti' 2004: 208-209)[136]
CHR	*-n-a*	PASS < VER.TR.D	(MacLeod 1987: fig. 8)
CHR	*-n-a*	PASS < VER.TR /N-CVC	(Wichmann 1999: 60)
CHR	*-w-a*	PASS < VER.TR.D (few)	(MacLeod 1987: fig. 8)[137]
CHR	*-w-a*	PASS < NOUN	(MacLeod 1987: fig. 8)
CHR	*-w-a, ~ -win-a*	PASS < VER.TR /{N-CVC,n_}	(Wichmann 1999: 60)
CHR	*-?tsa*	PASS < VER.TR /I/-system	(Fought 1967: 205)
CHR	*-tz'*	PASS < VER.TR (simple)	(Dayley 1990: 372)
CHR	*-¢'-a*	PASS < VER.TR.D [-CAUS]	(MacLeod 1987: fig. 8)
CHR	*-tz'a*	PASS < VER.TR	(Oakley 1966: 244)
CHR	*-tz'-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-?ka*	MED < VER.TR /I/-system	(Fought 1967: 206)
CHR	*-k'*	MED < VER.TR	(Dayley 1990: 372)
CHR	*-k'a*	PASS < VER.TR	(Oakley 1966: 244)
CHR	*-k'-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-k'-a*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHR	*-pa*	INTRS	(Oakley 1966: 244)
CHR	*-pa*	REFL < VER.TR /I/-system	(Fought 1967: 201)

[134] Fought (1984: 55) is likely correct to equate it with his CHR customary *–ma* (Fought 1967: 204) instead, and not a passive. Most other CHT forms, specifically *–{k', tz', p}-a*, are cognates to CHR mediopassives (Lacadena 2004b: fn. 95), although their role is not entirely clear by the misleading description in Morán (1685-95). They are taken as suffixes for changes of state (cf. Kaufman and Norman 1984: 108-109, Sattler 2004: 377-378, Storniolo 2008: 157-162). Also see footnote 136 and Chapter 3.1.4.1 for a discussion of the $–V_1y$ mediopassive.

[135] The grammar contains a plain error in saying that the passive is formed by ***–ka* with root transitives. But the example sentence provides the passive form *chujka* < *chuk*, "to capture" (Hull 2005: 25, Pérez Martínez 1996: 49). It conforms with the general CHR passive formation and ***–ka* obviously got re-interpreted in error as the derivational suffix.

[136] The equation of *–m-a* with *–n-a* is most likely an error, see Fought (1984: 55) for CHT who relates it to the CHR customary *–ma* (Fought 1967: 204). Oakley (1966: 244) describes *–ma* as to derive "a stem from transitive to intransitive: -chon- *to sell* (something), chonma *to sell* (in general)." This supports Fought for a 'habitual' use of verbs, but in reduction of the patient it should morphologically be considered as an antipassivation rather (Storniolo 2008: tab. 3.15), see Table 41 and footnote 329 for more details and footnote 71 regarding the question of such an epigraphically attested suffix.

[137] As the allomorph *–w-aj* described by Lacadena (2004b: 191-193) in the inscriptions only towards the end of the Late Classic and in a limited geographical area, namely Tikal and Copan, I concur with the opinion (Lacadena and Wichmann 2002, Mora-Marín 2005b: 22) that this form has to represent an ECh vernacular innovation (although not attested in CHT). Storniolo (2008) has not reconstructed it for ECh and it may be a genuine CHR development. However, the glyphic evidence, such as **BAK=wa=ja** < *bak-w-aj* (TIK Rock Sculpture, A3) does not support Wichmann's (1999: 60) linguistic evidence that this suffix is only used after non-CVC stems ending in /n/. This may represent another development not yet reflected in ClM.

CHR	*-p-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-p-a*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHR	*-p*	REFL VER.INTR	(Dayley 1990: 372)
CHR	*-ta*	INTRS	(Oakley 1966: 244)
CHR	*-ta*	RES < VER.TR /I/-system	(Fought 1967: 202)
CHR	*-t*	RES VER.INTR	(Dayley 1990: 372)
CHN	*-c-el*	PASS < VER.TR.R [+INC]	(Smailus 1975: 194)
CHN	*-c / -qu*	PASS < VER.TR.R	(Keller and Luciano 1997: 456)
CHN	*-k*	PASS < VER.TR	(Knowles 1984: 142-145)
CHN	*-ki*	PST THEM	(Pérez González 1985: 59)[138]
CHN	*-k-a-n*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 17)
CHN	*-c-(i)*	PASS < VER.TR.R [+COM]	(Smailus 1975: 194, 196)
CHN	*-k-a*	PASS < VER.TR.R [+INC,+NEG]	(MacLeod 1987: fig. 22)
CHN	*-k-i*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 17)
CHN	*-p-i*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 22)
CHN	*-le-c*	PASS < VER.TR.R [+SBJV]	(Kaufman and Norman 1984: 108)
CHN	*-k-a-k*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 17)
CHN	*-int-el ~ -ant-el*	PASS < VER.TR.D [+INC]	(Smailus 1975: 194)[139]
CHN	*-int*	PASS < VER.TR.D [±BEN]	(Keller and Luciano 1997: 456)
CHN	*-int*	PASS < VER.TR.D [-CAUS]	(Knowles 1984: 145-149)
CHN	*[-int*	PASS < VER.TR.D	(Kaufman 1994, A 4a: 46)
CHN	*-t-e / -i-n__*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 17)
CHN	*-t-i / -i-n__*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 17)
CHN	*-t-ik / -i-n__*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 17)
CHL	*<h>*	PASS < VER.TR.R	(Kaufman 1994, A 4a: 45)
CHL	*<j>*	PASS < VER.TR.R	(Dayley 1990: 374)
CHL	*<j>…-el*	PASS < VER.TR.R [+INC]	(Aulie and de Aulie 1978: 191)
CHL	*<j>…-el*	PASS < VER.TR.R [+INC]	(Vázquez Alvarez 2002: 53-54, 257-259)
CHL	*<h>…-el*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 17)
CHL	*<j>…-el*	PASS [+INC]	(Warkentin and Scott 1980: 64)
CHL	*-t /√{s,x,j}_*	PASS < VER.TR.R [+INC]	(Dayley 1990: 374)
CHL	*-tʌl /√{s,x,j}_*	PASS < VER.TR.R [+INC]	(Aulie and de Aulie 1978: 191)
CHL	*-tyäl /√{s,x,j}_*	PASS < VER.TR.R [+INC]	(Vázquez Alvarez 2002: 51-52, 252-256)
CHL	*-tyʌl /√{s,x,j}_*	PASS [+INC]	(Warkentin and Scott 1980: 64)
CHL	*-tʌl /√{h,s,š}_*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 17)
CHL	*-tʌl /√{ʔ,y,Č}_*	PASS < VER.TR.R [+INC] (few)	(MacLeod 1987: fig. 17)
CHL	*<j>…-i*	PASS < VER.TR.R [+COM]	(Vázquez Alvarez 2002: 53-54, 257-259)
CHL	*<h>…-i(y)*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 17)
CHL	*<j>…-i*	PASS [+COM]	(Warkentin and Scott 1980: 64)
CHL	*-l /√{s,x,j}_*	PASS < VER.TR.R [+COM]	(Dayley 1990: 374)
CHL	*-le /√{s,x,j}_*	PASS < VER.TR.R [+COM]	(Vázquez Alvarez 2002: 51-52, 252-256)
CHL	*-le /√{s,x,j}_*	PASS [+COM]	(Warkentin and Scott 1980: 64)
CHL	*-le(y) /√{h,s,š}_*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 17)
CHL	*-le(y) /√{ʔ,y,Č}_*	PASS < VER.TR.R [+COM] (few)	(MacLeod 1987: fig. 17)
CHL	*<h>…-ik*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 17)
CHL	*-le-k /√{h,s,š}_*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 17)
CHL	*-le-k /√{ʔ,y,Č}_*	PASS < VER.TR.R [+SBJV] (few)	(MacLeod 1987: fig. 17)
CHL	*-ʌl, al, -ol*	PASS.PTCP < VER.TR.R	(Attinasi 1973: 224)
CHL	*-bil*	PASS.PTCP < VER.TR.R	(Aulie and de Aulie 1978: 202)
CHL	*-bil, -ʌl*	PASS.PTCP < VER.TR.R	(Warkentin and Scott 1980: 41)

[138] The identification of this suffix is in error, as the accompanying examples *'a pul-kí*, "se estaba quemando" and *ki šuč-kí*, "yo estaba robando" show, compare to the derivation paradigms provided by Knowles (1984: 143-144). The same mistake is made for *–int* as a "marcador de pasado que antecede a la forma subjuntiva *–ik*" (Pérez González 1985: 58).

[139] Note the *–(i)n-t-* (to be followed by the aspect marker) in both CHN and CHL for derived transitive verbs. Presumably this led to the pCh reconstruction of **–nt-aj ~ *–n-aj*, and this is likely cognate to ECh *–n-a(j)*. Kaufman (1994, A 4a: 47) sees this suffix (and all other CHN and CHL *–(VC)t-Vl* passive suffixes) as a reflex of pM bounded passive **–o-t ~ *–a-t* of root transitives and **–t* of derived transitives. These remain the primary passive derivation in TZE and TZO.

CHL	*[-nt*	PASS < VER.TR.D	(Kaufman 1994, A 4a: 46)
CHL	*-nt*	PASS < VER.TR.D	(Dayley 1990: 374)
CHL	*-tel / n__*	PASS < VER.TR.D [+INC]	(Aulie and de Aulie 1978: 191)
CHL	*-tyel*	PASS < VER.TR.D [+INC]	(Vázquez Alvarez 2002: 57, 259-261)
CHL	*-tyel / n__*	PASS [+INC]	(Warkentin and Scott 1980: 64)
CHL	*-t-el / n__*	PASS < VER.TR.D [+INC]	(MacLeod 1987: fig. 17)
CHL	*-tyi*	PASS < VER.TR.D [+COM]	(Vázquez Alvarez 2002: 57, 259-261)
CHL	*-t-i(y) / n__*	PASS < VER.TR.D [+COM]	(MacLeod 1987: fig. 17)
CHL	*-ti / n__*	PASS [+COM]	(Warkentin and Scott 1980: 64)
CHL	*-t-ik / n__*	PASS < VER.TR.D [+SBJV]	(MacLeod 1987: fig. 17)

Table 6: Ch'olan forms for passive and mediopassive derivation and marking.

The Yukatekan passive formation (Table 7) differs considerably from the one proposed for Classic Mayan. For pYu, the derivational morpheme **–(a)b* is reconstructed, which continues as the sole derivation with *–b* for ITZ and MOP root transitives and *–äb* ~ *–ab* with non-CVC and derived transitives. YUK and LAK feature some innovation. The pYu **–(a)b* was retained as *–(a)b* in Colonial YUK for derived transitives, where it continues as *–aʔ(a)* and specifically as *–aʔab* in the completive aspect in modern YUK and LAK[140]. The derivational suffix is also retained as *–b* for CV' root transitives in modern YUK and LAK (Lacadena and Wichmann 2002: 284), but additionally to the glottalisation of the root vowel[141]. For root transitives, this is the sole derivational infix, which is a reflex to the pYu **–ab* (Bricker 1978: 14)[142].

For both root and derived transitives, the rule for the passive completive aspect suffix is COM > –Ø, otherwise *–i(h)* / __-3SG.ABS, functioning the same way in ITZ, MOP and LAK. The aspect suffix is retained as a morphophonemic portmanteau relict, but must not be taken as a cognate to the ECh thematic suffix, which is unknown to Yu. The subjunctive aspect suffix is kept with all absolutive pronouns. The Yukatekan languages thus cannot be taken as a comparative case for the phonology of the glyphic *–aj* thematic suffix.

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[140] Following McQuown (1967: 236), Bricker (1978: 14-15) further segments Colonial YUK incompletive and subjunctive *–ab* into *–a-b*, where the *–a* < *–aj* ought to represent the transitive aspect suffix. This again derives from Beltrán (1859: § 57): "Para pasivar los de la segunda y cuarta, se hace quitando la *h*, que es última letra del presente infinitivo en *bal*, v.g.: *cambezah*, enseñar: *cambeszabal*, ser enseñado […]." This seems doubtful in comparison with ITZ and MOP which retain an older derivational scheme. These take the same *–aj* aspect suffix for derived transitives (cf. Schumann Gálvez 1997: 124, 135), but only in the completive aspect, whereas *–ab* serves as the derivational morpheme in all aspects (cf. Schumann Gálvez 1997: 150). Colonial YUK has several classes of derived transitives (Smailus 1989: 41-50) with varying aspect markers. While some of them take *–aj* in the incompletive and/or subjunctive, only the completive is constantly realised by it. But again, the passive derivation is achieved by *–ab* in all aspects. This points to an epenthesis instead after the *√-(CV)C* morpheme unit of a derived transitive, the aspect marker gets deleted upon passivation. The intervocalic glottal stop described for modern YUK (and LAK) is also not satisfactorily solved (Bricker 1978: 14, 1986: 28). As Bricker (1978: fn. 8) correctly points out, the *–b* underwent a sound change [b'] > [ʔ] for the incompletive and subjunctive aspect (but also other phonemic environments, cf. Fisher 1973: 115, Hofling and Tesucún 2000: 19-20), but it does not explain it for the completive. Modern YUK additionally involves a tone change in the suffix.

[141] Also note the simultaneous tone change in YUK (Bricker 1978: 14, 1986: 26, Bricker, Po'ot Yah and Dzul de Po'ot 1998: 391) for root transitives from CVC to passive CV́ʔVC.

[142] According to Mora-Marín (2005b: 16), the pYu passiviser **–(aa)b* is no innovation, but derives (after data from Kaufman) from pM **–a-(a)b*, from where it might be inherited as a fossilised form in some Ch'olan expressions. This view is alternative to the pM **–ax* (see footnote 148) proposed by Houston, Robertson and Stuart (2000: tab. 5), unless pM knew several passivations (also see the GQa evidence in Table 9), as suggested by Kaufman's data (1994, A 4a: 47-48).

Mediopassives in Yukatekan are mainly formed by a tone change from CVC to CV́VC in modern YUK and a lengthening or glottalisation of the root vowel in the other members of the group (Bricker 1986: 26). YUK, LAK and ITZ feature derivations by an *–C-ah* pattern which by examination of the examples can be described as change of state mediopassives (see Chapter 3.1.4.1). The forms are cognate to those of ECh[143].

Idiom	**Attestations**		**Sources**
ITZ	*-b'*	PASS (canonical)	(Hofling and Tesucún 2000: 386-389)
ITZ	*-b-Vl*	PASS < VER.TR.R [+INC]	(Bricker 1986: tab. 11)
ITZ	*-b'-Vl ~ -b-ʌl*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 41)
ITZ	*-b'-Vl ~ -b-ʌl*	PASS < VER.TR.R [+INC]	(Hofling 1991: 32-33)
ITZ	*-b'ij*	PASS < VER.TR [+COM]	(Itza' 2001: 100, 146-147)
ITZ	*-b-(ih)*	PASS < VER.TR.R [+COM]	(Bricker 1986: tab. 11)
ITZ	*-b'-ih*	PASS < VER.TR.R [+COM]	(Hofling 1991: 32-33)
ITZ	*-b-Vk*	PASS < VER.TR.R [+SBJV]	(Bricker 1986: tab. 11)
ITZ	*-b'-Vk*	PASS < VER.TR.R [+SBJV]	(Hofling 1991: 32-33)
ITZ	*-ib-Vl*	PASS < VER.TR.D [+INC]	(Bricker 1986: tab. 11)
ITZ	*-äb-Vl*	PASS < VER.TR.D [+INC]	(Hofling 1991: 32-33)
ITZ	*-ib-(ih)*	PASS < VER.TR.D [+COM]	(Bricker 1986: tab. 11)
ITZ	*-äb-ih*	PASS < VER.TR.D [+COM]	(Hofling 1991: 32-33)
ITZ	*-ib-Vk*	PASS < VER.TR.D [+SBJV]	(Bricker 1986: tab. 11)
ITZ	*-äb-Vk*	PASS < VER.TR.D [+SBJV]	(Hofling 1991: 32-33)
ITZ	*-p-aj*	PASS (agentless)	(Hofling and Tesucún 2000: 58, 390-391)
ITZ	*-k'-aj*	CEL < VER.TR	(Hofling and Tesucún 2000: 58, 391-393)
MOP	*-b', -sab'*	INTRS	(Ulrich and Ulrich 1966: 262)
MOP	*-b'*	PASS < VER.TR.R	(Mopan 2001: 287)
MOP	*-b-Vl*	PASS < VER.TR.R [+INC]	(Schumann Gálvez 1997: 147)
MOP	*-b'-Vl ~ -b'-ʌl*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 41)
MOP	*-b'-ol*	PASS < VER.TR.R [+INC]	(Hofling 2011: 15)
MOP	*-b-(i)*	PASS < VER.TR.R [+COM]	(Schumann Gálvez 1997: 147)
MOP	*-b'-(i)*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 41)
MOP	*-b-Ø-(i)*	PASS < VER.TR.R [+COM]	(Hofling 2011: 15)
MOP	*-b'-Vk ~ -b'-ʌk*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 41)
MOP	*-b'-ok*	PASS < VER.TR.R [+DEP]	(Hofling 2011: 15)
MOP	*-ab'*	PASS < VER.TR.D	(Mopan 2001: 287)
MOP	*-ab-äl*	PASS < VER.TR.D [+INC]	(Schumann Gálvez 1997: 148-150)
MOP	*-a-b'-ʌl*	PASS < VER.TR.D [+INC]	(MacLeod 1987: fig. 41)
MOP	*-ab-(i)*	PASS < VER.TR.D [+COM]	(Schumann Gálvez 1997: 148-150)
MOP	*-a-b'-(i)*	PASS < VER.TR.D [+COM]	(MacLeod 1987: fig. 41)
MOP	*-a-b'-ʌk*	PASS < VER.TR.D [+SBJV]	(MacLeod 1987: fig. 41)
LAK	*<ʔ>…-Vr*	PASS < VER.TR.R [+INC]	(MacLeod 1987: fig. 31)
LAK	*<ʔ>…-V'*	PASS < VER.TR.R [+INC]	(Kováč 2012: 1)[144]

[143] These languages may have preserved a relict of a an **–aj* thematic suffix (or intransitiviser) in certain surroundings. Besides the cases described in Table 7, *–ah* is also described in connection with the antipassive of non-CVC or derived transitives in YUK (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 350-351) where it regularly, but not exclusively, occurs in the completive aspect in addition to the *–i(h)* aspect marker. There is no such pattern in MOP or ITZ attested (MacLeod 1987: fig. 40). We though have among Yukatekan *–ah* as a detransitiviser that may form verbal nouns (Table 57) in all four members of the group (MacLeod 1987: figs. 27, 28, 37, 38). In this respect, it highly interesting to note *–n-ah* among these to derive an intransitive from a noun or verbal noun (also antipassives from transitives) with resemblance to the ECh pattern. It is unclear whether YUK also preserved a (fossilised?) *–tz'-aj* mediopassive as a cognate to the ECh forms. The word *lamts'ahal*, "trasponer, pederse de vida" from the transitive *lam*, "hincar algo, sumir, hundir, confundir" (Barrera Vásquez 1993: 438) might be suggestive in this respect (Barbara MacLeod, personal communication, October 2011).

[144] All examples from Kováč (2012) are extracted from simple sentences provided by me in anticipating translations from Spanish to feature grammatical forms useful for the analytical groups. Not all translations yielded viable information. The translations base on a single informant, Héctor Xol Chok, and represent the northern

LAK	*<ʔ>…-b'-Vr*	PASS < VER.TR.R [+INC] /CVʔ	(MacLeod 1987: fig. 31)
LAK	*<ʔ>…-(i)*	PASS < VER.TR.R [+COM]	(MacLeod 1987: fig. 31)
LAK	*<ʔ>…-(i)*	PASS < VER.TR.R [+COM]	(Kováč 2012: 1)[145]
LAK	*<ʔ>…-b'-(i)*	PASS < VER.TR.R [+COM] /CVʔ	(MacLeod 1987: fig. 31)
LAK	*<ʔ>…-a'n*	PASS < VER.TR.R [+PRF]	(Kováč 2012: 1)[146]
LAK	*<ʔ>…-Vk*	PASS < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 31)
LAK	*<ʔ>…-b'-Vk*	PASS < VER.TR.R [+SBJV] /CVʔ	(MacLeod 1987: fig. 31)
LAK	*-aʔ-ar ~ -aʔ-ah*	PASS < VER.TR.D [+INC]	(MacLeod 1987: fig. 31)
LAK	*-aʔab'-(i)*	PASS < VER.TR.D [+COM]	(MacLeod 1987: fig. 31)
LAK	*-aʔ-ak ~ -aʔ-ʌk*	PASS < VER.TR.D [+SBJV]	(MacLeod 1987: fig. 31)
LAK	*-p-ʌh-ʌr*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 30)
LAK	*-p-ʌh(-i)*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 30)
LAK	*-p-ʌh-ʌk*	MED < VER.TR [+SBJV]	(MacLeod 1987: fig. 30)
LAK	*-k'(-ah)-ʌr/ir*	CEL < VER.TR.R [+INC]	(MacLeod 1987: fig. 30)
YUK	*<'>…-*V^{r}*l*	PASS < VER.TR.R [+INC]	(Smailus 1989: 54)
YUK	*<´ʔ>…-Vl*	PASS < VER.TR.R [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 391)
YUK	*<ʔ>…-b'-Vl*	PASS < VER.TR.R [+INC] /CVʔ	(MacLeod 1987: fig. 31)
YUK	*<'>…-(i)*	PASS < VER.TR.R [+COM]	(Smailus 1989: 54)
YUK	*<´ʔ>…-(ih)*	PASS < VER.TR.R [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 391)
YUK	*<ʔ>…-b'-(i)*	PASS < VER.TR.R [+COM] /CVʔ	(MacLeod 1987: fig. 31)
YUK	*<´ʔ>…-áʔan*	PASS < VER.TR.R [+PRF]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 391)
YUK	*<'>…-*V^{r}*c*	PASS < VER.TR.R [+SBJV]	(Smailus 1989: 54)
YUK	*<´ʔ>…-Vk*	PASS < VER.TR.R [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 391)
YUK	*<ʔ>…-b'-Vk*	PASS < VER.TR.R [+SBJV] /CVʔ	(MacLeod 1987: fig. 31)
YUK	*<´'*V_1*>*	PASS < VER.TR.R	(Dayley 1990: 376)
YUK	*-aab*	PASS < VER.TR	(McQuown 1967: 231)
YUK	*-ab*	PASS < VER.TR	(Swadesh, Álvarez and Bastarrechea 1970: 23)
YUK	*-ab-al*	PASS < VER.TR.D [+INC]	(Smailus 1989: 54)
YUK	*-b-al*	PASS < VER.TR.D [+INC]	(Tozzer 1921: 85)
YUK	*-á'a*	PASS < VER.TR.D [+INC]	(Dayley 1990: 376)
YUK	*-áʔal*	PASS < VER.TR.D [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 398)
YUK	*-aʔ-al ~ -aʔ-ah*	PASS < VER.TR.D [+INC]	(MacLeod 1987: fig. 31)
YUK	*-ab-(i)*	PASS < VER.TR.D [+COM]	(Smailus 1989: 54)
YUK	*-b-(i)*	PASS < VER.TR.D [+COM]	(Tozzer 1921: 87)
YUK	*-á'a-b*	PASS < VER.TR.D [+COM]	(Dayley 1990: 376)
YUK	*-áʔab'-(ih)*	PASS < VER.TR.D [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 398)
YUK	*-aʔab'-(i)*	PASS < VER.TR.D [+COM]	(MacLeod 1987: fig. 31)
YUK	*-áʔan*	PASS < VER.TR.D [+PRF]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 398)
YUK	*-ab-ac*	PASS < VER.TR.D [+SBJV]	(Smailus 1989: 54)
YUK	*-áʔak*	PASS < VER.TR.D [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 398)
YUK	*-aʔ-ak*	PASS < VER.TR.D [+SBJV]	(MacLeod 1987: fig. 31)
YUK	*-p*	INTRS	(McQuown 1967: 235)
YUK	*-p*	MED	(Dayley 1990: 377)
YUK	*-p-ah-al*	PASS [+INC] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)

dialect of Nahá and Metzabok (the Petjá group of Bruce [1968: 16-18]). This informant and his family utilise [r] for the otherwise northern ~ [l]. – The glottal infix is reconstructed from the example *a[h] pek' hatz'a'*, "el perro está golpeado". The suffix *–V'* has so far not been described and can be assumed to represent a dialectal variation [l] ~ [r] > [ʔ], a process also observed in other Mayan languages (compare e.g. *–Vl* forms in CHN).

[145] Originally, the example phrases "moja / mojó mi ropa en la lluvia" were intended to provide forms for the inchoative, but the informant apparently chose passive forms ("está mojando"): *tan u ch'uru' i nok' ich ha'* [+INC] and *ch'u'ri i nok' ich ha'* [+COM], we can isolate *[<ʔ>]…–V'* for the incompletive and *<ʔ>…-i* for the completive. The root *ch'ur* used for "get wet, moisten" is otherwise unknown, it may be ~ *ch'ul*, "orinar" and possibly related to *ch'ulam*, "almeja" (Bruce 1968: 90, 102), also with the connotation "cunt". Therefore, the phrase literally could read "my clothes were peed on in (= by) the rain".

[146] The example phrase is "el perro fue golpeado" and is translated as *a[h] pek' hatz'a'n.* When compared to YUK *<´ʔ>…-áʔan*, the informant might have chosen a perfective translation instead of the completive. Otherwise, LAK *–aʔan* has only been described as a stative suffix (Bruce 1968: 72) and possibly both YUK and LAK may use the existential form to describe a (non-incompletive) state of being / condition that is the result of an action.

YUK	*-p-ah(-ih)*	PASS [+COM] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)
YUK	*-p(-ah)-ak*	PASS [+SBJV] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)
YUK	*-k'*	INTRS	(McQuown 1967: 235)
YUK	*-k'*	MED	(Dayley 1990: 377)
YUK	*-k'-ah-al*	CEL [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)
YUK	*-k'-ah(-ih)*	CEL [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)
YUK	*-k'-ah-ak*	CEL [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)

Table 7: Yukatekan forms for passive derivation and marking.

The passive formation in Tzeltalan (Table 8) is quite uniform, yet it exhibits an interesting development and innovation for TZO. For pTz, **–ot* ~ **–at* have been reconstructed, which continue as *–ot* in Colonial Tzendal and modern TZE and *–at* in TZO (with rare ~ *–ot*). While TZE is very uniform, the situation is more diverse in TZO. Robertson (2010: 7-9), like with the CHL passive formation, considers a shift of the Colonial intransitive positional marker *–ey* percolating to the passive formation. Kaufman (cf. Mora-Marín 2005b: 31) considers the origin in a shift from pGT **–e(y)* ~ **–*V_1*y* 'general versive' to passive, retained in pCh as an intransitiviser (see Chapter 3.1.3 on the mediopassive). Therefore, TZO features *–ey* (often dialectally as *–e*)[147] as the passive marker solely for root transitives, while the pTz *–at* alternatively continues to be used with root transitives, but it is solely used among derived transitives (Robertson 2010: 9, 11), specifically when following the beneficative.

The origin of pTz passive derivation is not yet satisfactorily solved. If one follows Houston, Robertson and Stuart (2000: fig. 4) in that ClM and ECh passive are an innovation from Early Classic pCh and pGT intransitive positional marking, pTz passive may have developed from a pGT form[148] that may go back to pM bounded passive **–o-t* ~ **–a-t* (Kaufman 1994, A 4a: 47).

Idiom	Attestations		Sources
pTz	**-ot/-at*	PASS < VER.TR.R,VER.TR.D	(Kaufman 1972: 142)
pTz	**-bil*	PASS.PTCP [+PRF]	(Kaufman 1972: 142)
pTz	**<h>*	MED < VER.TR.R	(Kaufman 1972: 141)
TZE	*-ot*	PASS	(Ara 1986: f. 129v)
TZE	*-ot*	PASS	(Kaufman 1971: 68)
TZE	*-ot*	PASS (bounded)	(Kaufman 1994, A 4a: 47)
TZE	*-ot*	PASS	(Robertson 2010: tab. 5)
TZE	*-ot*	PASS	(Dayley 1990: 370)
TZE	*-ot*	PASS [+PRS,+PST]	(Hinmán Smith n.d.: 89)
TZE	*-ot*	PASS [+PRS]	(Slocum 1948: 86)
TZE	*-ot*	suffered action	(Robles Uribe 1962: 60)
TZE	*-ot*	PASS < VER.TR.R	(Shklovsky 2005: 56)
TZE	*-ot-uk*	PASS [+SBJV]	(Slocum 1948: 86)
TZE	*-b-ot*	PASS [+PRS,+BEN]	(Slocum 1948: 86)
TZE	*-bil*	PASS [+PRF]	(Slocum 1948: 86)
TZE	*-bil*	PASS [+PRF]	(Robles Uribe 1962: 59)

[147] It is difficult to judge whether the TZO *–e(y)* passive is thus a reflex of pGT (because of the pCh intransitiviser), or, because of its absence in TZE and dialectal restriction (Dayley 1990: 368) in TZO, it is just a colonial innovation. I nevertheless tentatively propose it for glyphic spellings (Table 10). Also refer to the development of the intransitive positional (Chapter 3.1.1.2) in the Tzeltalan sub-group.

[148] Houston, Robertson and Stuart (2000: tab. 5) propose pM **–ax*, and consider an archaic passive of that form being preserved on CPN St. J, D4 **ma-ka=xa** < **mak-ax*, D7a **K'AM=xa** < **k'am-[a]x* (Robertson, Houston and Stuart 2004: fn. 204) and likely B4b **pu-ku=xa** < *puk-[a]x* and C3 **sa-ka=xa** < **sak-ax*. Also compare to Q'anjobalan passive forms (Table 9) and their possible origin if a pM reflexive **–a-ox* and the discussion about 'middle voice' and antipassive forms in footnote 127.

TZE	*-bil*	PASS [+PFV]	(Hinmán Smith n.d.: 89)
TZE	*-b'il*	PASS.PTCP [+PST]	(Dayley 1990: 370)
TZE	*-vil*	PASS.PTCP [+PRT]	(Pineda 1887: 193-194, 205-207, 242-243)[149]
TZE	<*h*>	MED < VER.TR	(Kaufman 1971: 54)
TZE	<*j*>	MED < VER.TR	(Kaufman 1994, A 4a: 45)
TZO	*-ey, -ot, -at*	PASS	(Humberto Ruz 1989: 117)[150]
TZO	*-ey*	PASS	(Robertson 2010: tab. 5)
TZO	*-e(y)*	PASS < VER.TR.R	(Haviland 1988: 85, 114-115)
TZO	*-e(y)*	PASS < VER.TR.R	(Haviland 1981: 254-255)
TZO	*-ei*	PASS < VER.TR.R	(Schuller 1925: 203)
TZO	*-e*	PASS < VER.TR.R	(Dayley 1990: 368)
TZO	*-e*	PASS	(Laughlin 1975: 25)
TZO	*-e, -at*	PASS	(García de León 1971: 26)
TZO	*-e, -at*	PASS	(de Delgaty and Ruíz Sánchez 1978: 414)
TZO	*-b-at*	PASS [+BEN]	(de Delgaty and Ruíz Sánchez 1978: 414)
TZO	*-at*	PASS	(Laughlin 1975: 25)
TZO	*-at*	PASS [-PFV]	(Cowan 1969: 12)
TZO	*-ot*	PASS < VER.TR.R	(Schuller 1925: 203)
TZO	*-at*	PASS < VER.TR.D	(Schuller 1925: 203)
TZO	*-ot*	PASS (bounded)	(Kaufman 1994, A 4a: 47)
TZO	*-at ~ -ot*	PASS < VER.TR.D	(Haviland 1988: 85, 114-115)
TZO	*-at ~ -ot*	PASS < VER.TR.D	(Haviland 1981: 254-255)[151]
TZO	*-at ~ -ot*	PASS (simple)	(Dayley 1990: 368)
TZO	*-Vl*	PASS.PTCP [+PRF]	(Dayley 1990: 368)
TZO	*-Rl*	PASS [+PFV]	(Cowan 1969: 12)
TZO	*-bil, -balal*	PASS.PTCP [+SG,+PL]	(Haviland 1988: 85, 114-115)[152]
TZO	*-bil, -balal*	PASS.PTCP [+SG,+PL]	(Haviland 1981: 254-255)
TZO	*-bil*	PASS.PTCP	(Schuller 1925: 198)
TZO	*-bil*	PASS.PTCP [+PST]	(Dayley 1990: 368)
TZO	*-Ø*	PASS.STAT	(Cowan 1969: 12)
TZO	<*j*>	MED < VER.TR	(Kaufman 1994, A 4a: 45)

Table 8: Tzeltalan forms for passive derivation and marking.

The languages of the Greater Q'anjobalan branch (Table 9) show a considerable variety of forms that only loosely relate to Classic Mayan. From CHJ, TOJ and MCH we have phonological correspondences by *–(a)j* suffixes, that may be proceeded by other derivational affixes. From QAN and POP there is at least a *–l-Vj* pattern attestable. Both patterns may have emerged from pM mediopassive forms (Kaufman 1994, A 4a: 45-46)[153] and may still function as such, at least semantically. Related is the TOJ <*h*> infix as a reflex of the pM mediopassive and whose function is not entirely clear as passive or mediopassive (see Chapter 3.1.4.1).

[149] The use of the participial form is the only one described by Pineda for the passive voice. This is obviously based on the back application of the Spanish passive formation: "Esta [la voz pasiva] se forma usándose del participio de pretérito pasivo en todos los tiempos, se suprime el verbo *ser* con que se supple la voz pasiva en castellano […]" (Pineda 1887: 193-194).

[150] It is unclear whether Colonial TZO also knew an *–oy* allomorph, as there is one example <*Xepazoy*, soy hecho> in the 1723 *Arte de la lengua tzotzlem o tzinacanteca* by Rodaz and Pereyra (Humberto Ruz 1989: 123).

[151] The suffix *–e(y)* remains the standard derivational suffix for CVC root transitives and the choice between *–e(y)* and *–at* with some roots can base upon dialectal variation (Haviland 1981: 255). The form *–at* however is mandatory when the passive follows the *–b* beneficative suffix of ditransitive verbs (Haviland 1981: 256).

[152] Haviland (1988: 114) calls this a "stative aspect […] to produce an adjective or participle-like form that inflects with absolutive suffixes", e.g. with *'a'i-bil-Ø*, "it is understood" as 'understand-PASS-3SG.ABS'. The suffix therefore derivates the transitive root into an adjective.

[153] Depending on the model for the pCh passive derivation (see footnotes 128 and 129), there may be a correspondence with pGT **–aj* and **–ij* intransitivisers that originate from pM.

Another group of valency-decreasing mechanisms concerns *–(C)(a)x* suffixes attested in CHJ, TOJ and POP, supposedly having developed out of a pM reflexive intransitiviser (Kaufman 1994, A 4a: 44) **–a-ox* for root transitives and **–ox* for derived transitives. The same suffix also occurs in several EM languages as an intransitivising suffix[154]. We might deal with a mediopassive here as well (see Chapter 3.1.4.1) which marked the same, the suffix.

Besides other suffixes, POP *–ot* is of interest, as it resembles the pTz as well as TZE and TZO passive. It may have come from a common origin of pGQ (although not attestable in other Greater Q'anjobalan languages) or it diffused from Tzeltalan.

Another peculiarity in Greater Q'anjobalan is the variety of voice marking possibilities and the semantics to be expressed by different passive morphemes, as best demonstrated with CHJ (Buenrostro Díaz 2000, 2005)[155]. Some, e.g. in AKA, are further conditioned by tense/aspect or the arrangement of the passive phrase (cf. Méndez Martinez 2004: 184-185). We can also observe that some morphemes may both serve as the intransitivisers of transitive and positional roots.

Idiom	Attestations		Sources
CHJ	*-ax ~ x*	PASS	(Hopkins 1967a: 88-89)
CHJ	*-ax*	PASS (non-agentive)	(Kaufman 1994, A 4a: 44)
CHJ	*-ax ~ -max*	PASS	(Dayley 1990: 363)
CHJ	*-aj*	PASS	(Kaufman 1994, A 4a: 46)
CHJ	*-aj*	PASS < VER.TR.D	(Buenrostro Díaz 2000: 342-343, 2005: 225)
CHJ	*-aj*	PASS < VER.TR.D	(Buenrostro Díaz 2009: 182)
CHJ	*-n-aš*	PASS < VER.TR.D	(Hopkins 1967a: 89)
CHJ	*-nax*	PASS (animated patient)	(Buenrostro Díaz 2000: 344-345, 2005: 224)
CHJ	*-nax*	PASS	(Buenrostro Díaz 2009: 121, 184)
CHJ	*-aj ~ -chaj*	PASS	(Dayley 1990: 363)
CHJ	*-ch-aj*	PASS	(Kaufman 1994, A 4a: 46)
CHJ	*-ch(a)j*	PASS	(García Pablo and Domingo Pascual 2007: 251)
CHJ	*-chaj*	PASS	(Domingo Pascual 2007: 181)
CHJ	*-chaj*	PASS (processive)	(Williams and Williams 1966: 232)
CHJ	*-chaj*	PASS (simple)	(Buenrostro Díaz 2000: 343-344, 2005: 224)
CHJ	*-chaj*	PASS	(Buenrostro Díaz 2009: 42, 120, 167, 175, 184, 190)
CHJ	*-xi ~ -ji*	PASS	(Domingo Pascual 2007: 181)
CHJ	*-x(i) ~ -j(i)*	PASS	(García Pablo and Domingo Pascual 2007: 131, 251)
CHJ	*-ji*	PASS (agentless)	(Buenrostro Díaz 2000: 344, 2005: 224)
CHJ	*-ji*	PASS	(Buenrostro Díaz 2009: 121, 184, 190)
CHJ	*-b'il*	PASS.PTCP	(Buenrostro Díaz 2000: 345, 2005: 225)
CHJ	*-b'il*	PASS.PTCP	(Buenrostro Díaz 2009: 78, 176, 185, 188)
TOJ	*-h ~ -ah*	PASS < VER.TR (certain)	(Supple and Douglass 1949: 172)
TOJ	*-j*	PASS	(Buenrostro Díaz 2005: 224)
TOJ	*-j*	PASS	(Dayley 1990: 364)

[154] For example, KCH has *–x* with derived transitives (Sachse and Siis Ib'ooy 1997: 31), while MAM has *–ax ~ –iix* as the inchoative (England 1975: 100). For the correspondences between passive and inchoative derivation, also see Chapter 3.1.1.3.

[155] Several of the suffixes and their constraints are detailed in Table 9. Although some grammatical descriptions state a distinction, several examples suggests that the semantic borders between them are flexible. Compare to *a ta' chi' tzijtum tas tz-Ø-chonh{-nax, -chaj, -ji}-i* 'TOP PREP DEM mucho qué INC-3SG.ERG-vender-PASS-THEM' as "[a]llí venden muchas cosas." When contextually reviewing these forms, it is also important to keep in mind the confusion regarding the Greater Q'anjobalan voice system in relation to the mediopassive (see Chapter 3.1.4.2).

TOJ	*-ji, -j*	patient-experience voice	(Lenkersdorf 2002: 182-183)[156]
TOJ	*-h_2*	PASS	(Furbee-Losee 1976: 58, 136-137)
TOJ	*-H2*	PASS	(Furbee-Losee 1981, II: 95)
TOJ	<*h_1*>	INTRS < VER.TR,POS	(Furbee-Losee 1976: 62-64)
TOJ	<*j*>	INTRS < VER.TR	(Kaufman 1994, A 4a: 45)
TOJ	<*j*>	INTRS < VER.TR	(Dayley 1990: 364)
TOJ	<*h*>	INTRS < VER.TR,POS?	(Supple and Douglass 1949: 171)
TOJ	*-xi, -x*	impersonal-experience voice	(Lenkersdorf 2002: 184-185)[157]
TOJ	*-x*	PASS	(Dayley 1990: 364)
TOJ	*-š*	INTRS < VER.TR	(Supple and Douglass 1949: 171)
TOJ	*-ax*	MED	(Kaufman 1994, A 4a: 44)
TOJ	*-ub'al*	PASS.PTCP	(Dayley 1990: 364)
TOJ	*-UB'1/AL2*	PASS.NOUN	(Furbee-Losee 1981, II: 79)
TOJ	*-ub'al*	PASS [+COM]	(Buenrostro Díaz 2005: 225)
QAN	*-lay*	PASS	(Kaufman 1994, A 4a: 49)
QAN	*-lay*	PASS	(Mateo Toledo 2008: 69-70)
QAN	*-lay*	PASS	(Mateo Pedro 2009: 53)
QAN	*-lay*	PASS	(Q'anjob'al 2005: 117, 181)
QAN	*-lay*	PASS < VER.TR.R	(Francisco Pascual 2007: 44-45)
QAN	*-lay-i*	PASS	(Martin 1977: 163)
QAN	*-loj*	PASS < VER.TR.R (non-prod.)	(Francisco Pascual 2007: 45-46)[158]
QAN	*-le, -lo*	PASS	(Lara Martínez 1994: 92-93)[159]
QAN	*-ca*	PASS	(Lara Martínez 1994: 92-93)
QAN	*-chaj*	PASS (lexical)	(Mateo Toledo 2008: 70-72)
QAN	*-chaj*	PASS	(Q'anjob'al 2005: 117, 181)
QAN	*-chaj*	PASS < VER.TR.R	(Francisco Pascual 2007: 40-41)
QAN	*-chaj-i*	PASS	(Martin 1977: 164)
QAN	*-om*	PASS < VER.TR.D	(Francisco Pascual 2007: 48)
QAN	*-b'il*	PASS.PTCP [+PRF]	(de Diego Antonio et al. 2001: 24, 38)
QAN	*-b'il*	PASS.PTCP [+PRF]	(Francisco Pascual 2007: 69-70)
AKA	*-taʔ(a)*	PASS [+IPVF]	(Zavala Maldonado 1992a: 125, 173, 230-231)
AKA	*-ley*	PASS	(Akateka 2007: 198, 279-280)
AKA	*-le(y)*	PASS	(Méndez Martinez 2004: 119, 135, 185)
AKA	*-le*	PASS [-PFV]	(Zavala Maldonado 1997: 453)
AKA	*-le*	PASS	(Zavala Maldonado 1992a: 146)
AKA	*-le*	PASS	(Zavala Maldonado 1992b: 81-83)
AKA	*-cha*	PASS (adversive)	(Zavala Maldonado 1997: 454)
AKA	*-cha*	PASS	(Méndez Martinez 2004: 119, 185)
AKA	*-tša*	PASS (animate patient forced)	(Zavala Maldonado 1992b: 58, 81-83, 273)
AKA	*-b'il*	PASS [+PFV]	(Zavala Maldonado 1997: 454)
POP	*-(h)ot*	PASS	(Stratmeyer et al. 1966: 213)
POP	*-ot*	PASS [**FUT] (agentless)	(Craig 1977: 77-81)
POP	*-ot*	PASS	(Day 1973: 39)
POP	*-ot*	PASS	(Popti' 2001: 244)
POP	*-ot*	PASS [**FUT]	(Delgado Rojas et al. 2007: 139)
POP	*-ot*	PASS (bounded)	(Kaufman 1994, A 4a: 47)
POP	*-ot ~ -ut /CuC*	PASS < VER.TR.R,VER.TR.D	(Ross Montejo and Delgado Rojas 2007: 38-39)

[156] The allomorph *–ji* is apparently used in the incompletive and completive aspects, while *–j* used with certain persons in other aspects, e.g. future/dependent *'oj 'iljuk*, "sera visto" and progressive *wan yiljel*, "está viendo" (Lenkersdorf 2002: 327). Like with *–ji*, the final vowel is elided in aspects other than the incompletive and completive. By its morphology and function, the suffix is similar to the Ch'olan antipassive on *–x* (see footnote 127), but may not be considered a cognate because of the existence of other *–(V)x* (medio)passives in GQa. Kaufman (1994, A 4a: 44) considers *–(V)x* as a mediopassive.

[157] This form, a mediopassive rather, may appear inflected with all persons, however it is most common with 3SG.ABS and corresponds best to the Spanish impersonal construction "se …", e.g. *'ilxi*, "se vio".

[158] The examples provided are recognisable as intransitive positionals, compare *max choyloji*, "fue aflojado" with *choyan*, "flojo" (Q'anjob'al 2003: 49). In POP however, the suffix clearly functions as a proper passiviser. As it is described as non-productive in QAN, we may infer this is because of the missing differentiation between transitive and positional roots (cf. Wichmann 2002a: 7-8).

[159] While *–ca* is fully productive, *–lo* undergoes certain restrictions as to person marking and *–le* seems to be lexicalised with certain verbal bases.

POP	*-lax*	PASS (agentless)	(Craig 1977: 77-81)
POP	*-lax*	PASS	(Stratmeyer et al. 1966: 213)
POP	*-lax*	PASS	(Day 1973: 43)
POP	*-lax*	PASS	(Kaufman 1994, A 4a: 49)
POP	*-lax*	PASS < VER.TR.R,VER.TR.D	(Ross Montejo and Delgado Rojas 2007: 37-38)
POP	*-lax*	PASS	(Popti' 2001: 244)
POP	*-lax*	PASS	(Delgado Rojas et al. 2007: 139)
POP	*-lo*	PASS	(Craig 1977: 81-82)
POP	*-lo*	PASS	(Popti' 2001: 244)
POP	*-loh ~ luh /CuC*	PASS	(Ross Montejo and Delgado Rojas 2007: 41)
POP	*-loh*	PASS	(Delgado Rojas et al. 2007: 139)
POP	*-cha*	PASS (with agentive phrase)	(Craig 1977: 82-83)
POP	*-cha*	PASS	(Popti' 2001: 244)
POP	*-chah*	PASS (result of force)	(Delgado Rojas et al. 2007: 139)
POP	*-chah*	PASS < VER.TR.R	(Ross Montejo and Delgado Rojas 2007: 40)
MCH	*-j(-i)*	PASS < VER.TR.R,VER.TR.D	(Palosaari 2011: 188)[160]
MCH	*-hi*	PASS	(Martin 1990: 427)
MCH	*-x ~ -ex*	PASS (rare)	(Palosaari 2011: 188)
MCH	*-ech*	PASS (rare)	(Palosaari 2011: 188)
MCH	*-e'*	PASS	(Martin 1990: 423)[161]

Table 9: Greater Q'anjobalan forms for passive derivation and marking.

For the passive and mediopassive function of test group 1, only the Ch'olan branch provides sufficient evidence. Especially the ECh languages have a strong trait of the forms for reconstructed pCh. While other intransitivising suffixes of *–*Vj* shape of various purposes are known from Ch'olan languages (and going back at least to pGT), –*aj* has shown a constant phonemic structure from at least the point it became a thematic suffix. No allomorphs are known and the suffix vowel always was short, and the final /j/ only got lost in the individual CHT and CHR languages. It is thus not surprising to find it in synharmonic **Ca=ja** / __# spelling patterns in hieroglyphic ClM[162]. Only in the Late Classic **Ca** / __# spellings are attested to possibly reflect the phonological development in the individual languages (see footnote 84). In this respect, the epigraphic data mostly confirm with the proposals by Mora-Marín (2005b, 2009).

One important question concerns the morphophonemics of the ClM –*aj* thematic. While we have evidence of syncopation (see footnotes 37 and 105), we can surely infer that the form was –*aj* / __# and –*(a)j* / __(')V and / __VC (cf. Lacadena 2004b: 167), but otherwise possibly *–*a* / __C only[163]. Since the epigraphically attested forms either end in a zero morpheme or another –*VC* suffix to follow, it is hard to proof this assumption.

[160] The –*i* represents a phrase final intransitive thematic (Palosaari 2011: 124, 189) that gets mostly elided when followed by a plural personal pronoun. Possibly it is related to pM *–*ik*.

[161] This form is inferred from one example: *ch-Ø-'al-e'* 'INC-3SG.ABS-say-PASS'. It may be a borrowing from the dialectal TZO passive –*e(y)*.

[162] For the mediopassive, only spellings for –*p-aj* (Lacadena 2004b: fn. 101) and –*k'-aj* (Beliaev and Davletshin 2003) have been identified with fair confidence. Those on *–*{tz', t}-aj* lack epigraphic testimony.

[163] It is based on several observations. As the CHT data show, incompletive –*a-l* < –*a-el* and subjunctive –*a-k* < –*a-ik* have lost the final spirant. The incompletive of intransitivised transitives still had preserved –*ah-el* in some instances (Sattler 2004: 377) as a reflex. If one checks the references of those examples in Table 6, but also for the Yukatekan languages in Table 7, one will often recognise that a final weak consonant (/h, j, y/, sometimes preceded or followed by a vowel) is also often only pronounced / __# or / __(')V. Also refer to analogue (though reverse) morphophonemic considerations of the root transitive plain status marker (Chapter 3.1.3.1) and the intransitive / mediopassive marker (Chapter 3.1.4.1). Still, I would lean towards a ***Ca=ja=CV** spelling for *–*a*

Only some questionable CHN vernaculars have been attested in hieroglyphic writing (footnotes 82 and 130), but these adhere to the proposed pCh phonemic suffix structure, and a change *–aj* > *–i* occurred only later. The same could be proposed for most CHL passive forms, but no form has yet been described and spelling patterns must remain hypothetical. The proven forms also attest a completive aspect for most of the passive spellings[164]. No WCh mediopassives adhere to the ECh scheme (MacLeod 1987: fig. 16).

Yukatekan and Tzeltalan feature considerable different passive patterns and do not contribute any samples to test case 1. There is some evidence from Chichen Itza (Lacadena 2004b: 193, Lacadena and Wichmann 2002: 283-284), where CVC root transitives are derived by *–b*, following the pattern of modern ITZ and MOP rather and thereby reflecting a pYu form[165], testifying no split yet took place. Another instance is the derivation by *–b* from a CV' verb in the Madrid Codex (Bricker 2000b: 104, Lacadena 2004b: 193, Lacadena and Wichmann 2002: 283-284)[166]. Other spellings diagnostic for a proper YUK affiliation have not yet been described. As there are intransitivations and YUK and LAK mediopassive derivations resembling those of ECh[167], such spellings diagnostic to the latter may occur in a vernacular context as well. But no such forms have yet been reconstructed for pYu or unambiguously identified or attested in the script. No specific Tzeltalan passive form has yet been illustrated in the hieroglyphic corpus[168].

/ __C rather instead of ***Ca=CV**, because of the visual reading aid the former spelling provides (also see Chapter 3.1.3.1 for further considerations). This might very well also apply to (late?) spellings in front of a vowel initial suffix, such as **u=tz'i-bi=na=ja=la** (K2914, A3-A4), where **ja** can be taken as evidence for a full phonemic reading of the nominalised passive *u-tz'i[h]b-n-aj-al*, but also just as an overspelling of a visual passive marker, while the underlying form was already *u-tz'i[h]b-n-a-['](a)l* (compare to CHR *–a'r*, footnote 447).

164 There are some forms with **=je=la** considered as a passive (Lacadena 2009: 44), but these are nominalised, bearing a 3SG.ERG, and have an allomorph (Lacadena and Wichmann 2005b: 28) and thus adhere to control group 3 (see footnote 37). Furthermore, these forms rather seem to represent a nominalised antipassive (see Chapter 3.1.6). From PAL TI-W, A10-B10, we however know the optative *ichna'ik* (see etymological discussions in Beliaev and Davletshin 2006: fn. 26, Lacadena 2009: fn. 7, MacLeod 1999, Tokovinine 2006: fn. 11). Morán (1685-95: 149) has described the CHT particle <*naic*>, "ojala" to follow the verb (Sattler 2004: 401). Could the particle have derived from a subjunctive passive **ich-n-a(j)-ik* 'face-PASS-THEM-SUBJ' of a derived transitive **ich-a* with the underlying meaning of something like "may you face to…"? See Ch'olan *(w)ut* vs. Yukatekan *(w)ich* (Fox 1978: 139-140) from pM as the underlying noun for "eye, face". Also compare to ClM *hich ~ yich*, "(writing) surface" (MacLeod 1990: 252-259), *y-ich-nal*, "in the presence of" (cf. Davoust [1995: 597] for the reading, Hanks [1990: 91-92] for the deictic perspective) and probably *k'inich*, "sun-eye" (cf. Wichmann [2004b: 77-82] for a full discussion).

165 These are **jo-ch'o=bi=ya** < *joch'-b=iy* (CHN CC-HB, 13-14) and **jo-lo=bi=ki** < *jol-b-ik-i* (CHN TFL-2, E4). It is interesting to note that the Casa Colorada example does not feature the proposed **hi** sign to mark the YUK completive, but rather **ya** as to conform with Classic patterns of marking the temporal deixis (see Chapter 1.2.2.2), if it was not used as an indicator for the completive marker *–i* / __# (also see footnote 121).

166 The example is **tz'a=bi** < *tz'a[']-b-i* (C Ma. 52c). This spelling specifically follows a pattern described for Colonial YUK which can be expected considering the dating of the codex (see Chapter 2.5.3.3).

167 Also see Chapter 3.1.1.2 for celeritive derivations in the Tzeltalan branch (Table 13) that are cognate to Ch'olan and Yukatekan mediopassives.

168 For *–at*, I assume (Table 10) a synharmonic realisation by ***Ca=ta** / __#. For its allomorph *–ot*, a synharmonic spelling would be consequent, but I hypothesise a ***Co=ta** / __# realisation rather for two reasons. A graphemic indication of the Tzeltalan passive suffix by **ta** would be more consistent. Furthermore, **to** has only been listed by Thompson (1962, as T44) as a prefix or superfix, while as a subfix (as T138) only in the Postclassic. The concordance for Palenque (Ringle and Smith-Stark 1996), considered as representative to a certain degree, does not provide an example of **to** in a word-final position. The same problem arises to some extent with *–e(y)*, as the allographs for **ye**, applying the same survey as for **to**, do seldom appear in a word-final position (T220a, T512),

Although not itemised in all cases, all of the four featured language families have a perfect passive participle *–b-il* (rarely ~ *–b-al*). It certainly was retained from a pM **–b-il* (Dayley 1990: 384), and we may reconstruct the same phonology for pCh.

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√<h>-aj*	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√<h>-[a]j	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	√-n-aj	**CV$_1$-CV$_1$=na=ja / CV$_1$C(-CV$_1$)=na=ja**	1.f.ii
	** √-b-il*	**CV$_1$-CV$_1$=bi-lV / CV$_1$C(-CV$_1$)=bi-lV**	1.f.ii
Eastern Ch'olan	*(*) √-C$_d$-aj*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**	1.f.ii
	C$_d$={w,p,tz',k',t}	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**	1.f.i
Western Ch'olan	** √-k-i*	**CV$_1$-CV$_1$=ki / CV$_1$C(-CV$_1$)=ki**	2.f.i
	** √<h>-i(y)*	**CV$_1$-Ci(=yi) / CV$_1$C-Ci(=yi)**	1.g.i (1.a,b,c,d.i)
	** √-le(y)*	**CV$_1$-CV$_1$=le(-yV) / CV$_1$C=le(-yV)**	2.f.i (2.f.ii)
Yukatekan	*√-b-i(h)*	**CV$_1$-CV$_1$=bi(-hi) / CV$_1$C(-CV$_1$)=bi(-hi)**	2.f.i (2.f.ii)
		CV$_1$(-V$_1$)=bi(-hi) / CV$_1$'(-V$_1$)=bi(-hi)	2.f.i (2.f.ii)
	** √-i(h)*	**CV$_1$-Ci(=hi) / CV$_1$C-Ci(=hi)**	1.g.i (1.a,b,c,d.i)
	** √-ab-i(h)*	**CV$_1$-Ca=bi(-hi) / CV$_1$C-Ca=bi(-hi)**	1.a,b,c,d.i
	** √-[a]b-i(h)*	**CV$_1$-CV$_1$=bi(-hi) / CV$_1$C(-CV$_1$)=bi(-hi)**	2.a,b,c,d.i (2.e.i)
Tzeltalan	** √-ot*	**CV$_1$-Co=ta / CV$_1$C-Co=ta**	1.a,b,c,d.i ,ii
	** √-[o]t*	**CV$_1$-CV$_1$=ta / CV$_1$C(-CV$_1$)=ta**	2.a,b,c,d.i (2.e.i)
	** √-at*	**CV$_1$-Ca=ta / CV$_1$C-Ca=ta**	1.a,b,c,d.i
	** √-[a]t*	**CV$_1$-CV$_1$=ta / CV$_1$C(-CV$_1$)=ta**	2.a,b,c,d.i (2.e.i)
	** √-e(y)*	**CV$_1$-Ce(=yV) / CV$_1$C-Ce(=yV)**	1.g.i (1.a,b,c,d.i,ii)

Table 10: Representative, linguistically induced spelling patterns on junctures to be expected for the passive and mediopassive thematic suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.1.2 – Intransitive Positional Marker *–aj ~ –j*

Intransitive verbs derived from positional roots or stems (termed "assumptive" by Kaufman [1994, A 10: 65]), feature different sets of suffixes, depending on what aspect they appear in (Table 11). The incompletive is generally following a **–tal* vocalisation, which can be attested in ClM[169]. The completive aspect varies and is *–wan* in CHT, CHR and CHN, and *–le(l)* in CHL. The prevalent *–wan*

One of them (ZY7 = T512) graphemically occurs in a block-final position, as in the full name of GI of the Palenque Triad (e.g. PAL TC, C8-D8). Stuart (2005b: 161-162) however questions the reading of this grapheme as **ye** (Stuart in Schele 1991: 18-21), yet I consider it valid (cf. TRT Bx. 1, J2-K1 **ye=te k'a-ba=li**). MZR (= T220a) is mainly known from Early Classic contexts (also cf. Boot 2006a: 8-9) for the suffix *–ey* (e.g. **HUL=ye**, ZAP St. 5, A5), which has been interpreted in different ways (e.g. Houston, Robertson and Stuart 2000: 331-332, MacLeod 2004: 307, Stuart, Houston and Robertson 1999, II: 37). A passive on *–e(y)* might therefore reasonably be spelled by ***Ce=ye** / __# also in Late Classic times. Considering the idea of visual markers in the script (see Chapter 2.5.3.2), one would rather exclude **ya** (as used for temporal marking, see Chapter 1.2.2.2) but not necessarily **yi** with its preponderance among mediopassives, see Chapter 3.1.4.1. As there is a close evolutional correspondence between the TZO passive, the ClM mediopassive and the pTz/TZE intransitive positional (Chapter 3.1.1.3), ***Ce=yi** / __# is also possible. Still, **yo** and **yu** would also remain candidates.

169 A spelling **ti CHUM^{mu}=ta-li** < *ti chum-tal* occurs on K2784, C2-C3 (Mora-Marín 2005c). Although embedded in a prepositional construction (Josserand, Schele and Hopkins 1985), thus suggesting a nominalised form, we can clearly observe the incompletive positional marking. However, the suffix originates from pM nominaliser **–tal* and might have been acquired by pCh through pYu diffusion (Kaufman and Norman 1984: 107). The vessel was found in Dos Pilas, and might indicate an Eastern Ch'olan form.

seems to be an innovation (see footnote 68)[170]. The question, whether pCh originally had ***–le* (as per CHL) or ***–l-aj* (as per ClM) was originally left open (Kaufman and Norman 1984: 107). I consider * *–l-aj* as an innovation as well (see below and footnote 68), and consider the proper pCh ***–le* reaching back to pM ***–le* (Kaufman 1994, A 10: 65), also supported by recent epigraphic evidence[171].

We can also observe some parallels between passive derivation and positional marking (Kaufman and Norman 1984: 109), especially for the morphophonemically conditioned CHL forms. There are also possible common origins with some inchoative derivations[172].

The origin of ClM *–l-aj* is still questionable. We have evidence (Kaufman and Norman 1984: 106-107) that the pGT and pCh intransitive marker of positionals was ***–l* (also see Chapter 3.1.5). As an alternative to other authors (Houston, Robertson and Stuart 2000: 333, tab. 5, fig. 4, Hruby and Child 2004: 16-17) that consider * *–l-aj* < pGT ***<h>…-V_1l-aj*, I propose two other evolutionary processes that do not need to rely on an intransitivised stative. Despite phonological issues, pTz has * *–ej* (Kaufman 1972: 145) which gets attached to *√-l* to derive a nominalised form[173]. Following MacLeod (1984: 243), we may consider ClM *–l-aj* to have percolated from a pYu vernacular context into the script (see footnote 433), with the pYu ***–l* intransitive positional marker and the completive aspect

[170] Also compare to the epigraphic data (Hruby 2002, Hruby and Child 2004) which date the first occurrences of *–wan* to the Late Classic (and the further east, the later). In contrast, the epigraphically attested *–laj* already appears in cycle 8 inscriptions, e.g. at Tikal.

[171] The evidence cited by Kaufman is pWa ***–le*, pYu ***–l-*, pCh ***–le*, pTz ***–lej* and the possibly diffused QEQ *–lVh*. He sees pM ***–le* to have originated from the ***–l* passive and the EM assumptive ***–e-7b'* (Kaufman 1994, A 10: 58), while at some point [b'] > [ʔ] / __#. The COL Yax Wayib Mask, F5 (Carrasco 2009: 612, fig. 7) in my view provides confirmation for an Early Classic pCh/ClM form with **CHUM=le** < *chum-le-Ø*, "she sat". The spelling is clearly a verbal predicate, as it is followed by *Ix Uj Ajan* (Carl Callaway, written communication, June 7, 2012); a stative *–V_1l* to be expressed by **le** can be excluded by syntactic reasons (also anticipating **li** as proven by other examples, e.g. CPN HS. 1 VIII, N1). There is no fixed dating for the greenstone mask (Zender dates it to around 445 AD [Callaway 2011: 134, 135]), but it is likely later than the earliest safely dateable occurrence of *–l-aj* in the epigraphic record on COL Leiden Plaque, B9. The new epigraphic evidence questions the original view (Kaufman and Norman 1984: 107) for the innovation CHL *–le* < pCh ***–la(j)-i* with the vowel of the suffixes contracted.

[172] See Kaufman (1994, A 4a: 49) for a pM passive derivation on ***–l* to be reflected in ECh *–l-a* ~ *–r-a* inchoative. Etymologically, a correspondence between positional and inchoative marking is explainable: intransitive positionals describe the act of becoming into a position. This may also be reflected by some grammarians' choice to describe a positional marking as an inchoative. Compare POS / INCH [+INC]: *–tal* / *–ta-el* (CHT), *–tel* / n.a. (CHN), *–tʌl* / *–tʌl(-el)* (CHL); also POS / INCH [+COM]: *–l* / n.a. (CHN), *–le(y)* / *–l-e(y)* (CHL). Also compare these forms to PASS [+INC, +COM] in CHL: *-tʌl / {s, x ,j}__* and *-le / {s ,x, j}__*. Also see Chapter 3.1.1.3 for a more thorough discussion. However, Kaufman (1994, A 4b: 11), like other authors (see footnote 169), does not consider the Ch and Yu incompletive assumptive ***–t-äl* ~ ***–t-al* as a reflex of the pM bounded passive ***–o-t* ~ * *–a-t*, but as a nominaliser, hence the Common Ch'olan passive [+INC] *–t-al* should be reflex of this. Following this line of argumentation, the Ch'olan passive should be a nominaliser as well or at least developed out of it. This draws interesting parallels to considerations to also treat other incompletive forms as nominalisations (see footnotes 440 and 462).

[173] For example *chot-l-ej*, "sitting, place to sit" (Kaufman and Norman 1984: 106) or *–pak'-l-ej*, "lugar plano" (García de León 1971: 30). From a morphological point of view, a nominaliser may appear as a reasonable origin, considering the change in function of the incompletive * *–tal*. A change [e] > [a] is harder to explain, although MacLeod (1984: 244) attests the reverse (e.g. observable with the incompletive marker in CHN), and unless we had a pGT allomorph ***–aj*. Interestingly, Kaufman (1994, A 10: 65) also provides the transitive (portative) positional marking as ***<h>…-e* for EM and ***<h>…-a* for WM (assuming that EM generally is more conservative with pM reflexes and sound shifts rather occur among WM languages). It is also noteworthy that e.g. TZO, despite its different intransitive positional marking (Table 13) in the plain status, retains the subjunctive as *–l-{i, u}k*, e.g. *vaʔlikotik*, "parémonos". Haviland (1981: 320) also explains this via a syncopation of the stative *–Vl* of positionals, but it may also be a reflex of a pGT or earlier suffixation.

marker *_–aj_. In a pCh context, the aspect marker (which is basically non-existent in Ch'olan due to thematic suffixes instead) may have got re-interpreted as the thematic of derived intransitives.

The co-existence of these forms is demonstrated by the earliest occurrence of _–laj_ on COL Leiden Plaque, B9, with a cycle 8.14 Long Count. A little later occurs _<h>…-aj_ on TIK Hombre, C8, dated to 8.18 (Fahsen 1988: 6) and latest is the COL Yax Wayib Mask with _–le_ at about 9.0. While the latter show pGT and pCh markings, the (competing) introduction of _–laj_ may be explained by the Central Lowland provenience, an area which supposedly was surrounded or even interspersed with areas of pYu speakers (compare to Figure 3). It still remains opaque why _–laj_, considering its innovative nature, became the preponderant suffix to mark the intransitive positional in contrast to the proper Early Classic ClM _–le_.

One major problem remains with the fact that on the other hand we have the pGT *_<h>…-aj_ intransitive positional marker (Houston, Robertson and Stuart 2000: 333, tab. 5, fig. 4, Lacadena 2004b: 169-170) that may have survived still into Early Classic pCh as a pGT reflex, at a time when pCh already had *_–le_ as the respective marker. This question has to remain unresolved, regardless whether *_–l-aj_ or *_–le_ was the original pCh marker (Kaufman and Norman 1984: 107). Assuming that *_<h>…-aj_ may even go back further than pGT and that pCh *_–le_ < pM *_–l-e'_, there could have been two markings co-existing, as ClM _–laj_ and _–wan_.

As mentioned above (Chapter 2.1.4), both _–laj_ and _–wan_ became interpreted an indispensable unit upon their appearance in the script. Therefore, we may not expect internal vowel changes, and no epigraphic evidence supports the contrary. Therefore, the Ch'olan intransitive positional will be excluded from the test cases[174], and the underlying linguistic forms will only be provided for reasons of completeness.

Idiom	Attestations		Sources
pCh	*_-täl_	NSTAT [+INC]	(Kaufman and Norman 1984: tab. 14)
pCh	*_-wan_	VER.INTR < POS [+COM]	(Kaufman and Norman 1984: tab. 14)
pCh	*_-le_	VER.INTR < POS [+COM]	(Kaufman and Norman 1984: 107)
pCh	*_-la(j)-i_	VER.INTR < POS [+COM]	(Kaufman and Norman 1984: 107)
pCh	*_-le-k_	VER.INTR < POS [+DEP]	(Kaufman and Norman 1984: tab. 14)
ECh	*_-wan_	VER.INTR < POS [+IPVF]	(Storniolo 2008: 156)
CHT	_-tal_	VER.INTR < POS [+INC]	(MacLeod 1987: fig. 6)
CHT	_-tal_	VER.INTR < POS [+INC]	(Sattler 2004: 376)
CHT	_-wan_	VER.INTR < POS	(Robertson, Law and Haertel 2010: 162)
CHT	_-wan_	VER.INTR < POS [+COM]	(MacLeod 1987: fig. 6)
CHT	_-van_	VER.INTR < POS [+COM]	(Sattler 2004: 376)
CHT	_-l-ek_	VER.INTR < POS [+SBJV]	(MacLeod 1987: fig. 6)
CHT	_x-…-lec_	VER.INTR < POS [+SBJV]	(Sattler 2004: 376)
CHR	_-wan_	VER.POS THEM	(Wichmann 1999: 49-50)
CHR	_-wan_	VERS < POS	(Pérez Martínez 1996: 39)

[174] While the fixed vowel ClM intransitiviser *_–aj_ may not contribute any further to the spelling practices among positional suffixes, the positional instrumental (Chapter 3.1.5) is much more suitable to pursue the issue for a couple of reasons: (1) the quantity of samples is more manageable, (2) the instrumental suffix itself is of a variable vowel, thus *_–l-Vb_ < **lV**=**bi** / __# may be possible, and (3) we may deduce that the positional instrumental, as _–laj_, likewise became perceived an inseparable unit by Classic scribes if the data only show a fixed vowel realisation, which may be expected as _–l-ib_ < **li**=**bi** / __#.

CHR	*-w-an*	VERS < POS	(Ch'orti' 2004: 153)
CHR	*-wan*	VER.INTR < POS [+INC]	(MacLeod 1987: fig. 6)
CHR	*-wan*	VER.INTR < POS [+COM]	(MacLeod 1987: fig. 6)
CHR	*-wan*	ASSUM [+COM]	(Kaufman 1994, A 10: 60)
CHR	*-wan*	REFL < POS	(Oakley 1966: 243)
CHR	*-ik ~ -Vk*	VER.INTR < POS [+SBJV]	(MacLeod 1987: fig. 6)
CHR	*-b'{a,u}na*	VER.INTR < POS	(Ch'orti' 2004: 154)[175]
CHN	*-t-el*	INCH [+PRS]	(Smailus 1975: 192-193)[176]
CHN	*-tel*	VER.INTR < POS [+INC]	(MacLeod 1987: fig. 21)
CHN	*-te*	VER.INTR < POS [+INC]	(MacLeod 1987: fig. 15)
CHN	*-tä*	VER.POS [+INC]	(Keller and Luciano 1997: 459)
CHN	*-te(l)*	VER.POS [+INC]	(Knowles 1984: 75, 103)
CHN	*-wän-e(l)*	VER.POS [+INC]	(Knowles 1984: 75, 103-105)
CHN	*-van*	INCH.PRT	(Smailus 1975: 192-193)
CHN	*-wʌn-(i)*	VER.INTR < POS [+COM]	(MacLeod 1987: fig. 15)
CHN	*-wän-i*	ASSUM [+COM]	(Kaufman 1994, A 10: 60)
CHN	*-wän-i* /__-3SG	VER.POS [+COM]	(Knowles 1984: 75)
CHN	*-wän-Ø*	VER.POS [+COM]	(Knowles 1984: 75)
CHN	*-wän*	VER.POS [+COM]	(Keller and Luciano 1997: 460)
CHN	*-(wän)-ik*	VER.POS [+SBJV]	(Knowles 1984: 128-129)
CHN	*-l*	VER.POS [+COM]	(Keller and Luciano 1997: 460)
CHN	*-le*	ASSUM [+DEP]	(Kaufman 1994, A 10: 59)
CHN	*-l-ec*	INCH [+FUT]	(Smailus 1975: 192-193)
CHN	*-l-ek*	VER.INTR < POS [+SBJV]	(MacLeod 1987: fig. 15)
CHN	*-l-ek*	VER.POS [+SBJV]	(Knowles 1984: 129)
CHN	*-lec ~ lequ*	VER.POS [+SBJV]	(Keller and Luciano 1997: 463)
CHL	*-tʌl*	VER.INTR < POS [+INC]	(MacLeod 1987: fig. 15)
CHL	*-tʌl*	VER.INTR < POS [+PRS]	(Aulie and de Aulie 1978: 190)
CHL	*-tyäl*	VER.POS [+IPVF]	(Vázquez Alvarez 2002: 59)
CHL	*-töl*	VER.INTR < POS [+PRS]	(Schumann Gálvez 1973: 26)
CHL	*-tyʌl*	VER.INTR [+STAT] /*-Vl*	(Warkentin and Scott 1980: 77)
CHL	*-l-e(y)*	VER.INTR < POS [+COM]	(MacLeod 1987: fig. 15)
CHL	*-le*	VER.INTR < POS [+PFV]	(Vázquez Alvarez 2002: 59)
CHL	*-le*	VER.INTR < POS [+PST]	(Aulie and de Aulie 1978: 190)
CHL	*-lel, -le*	VER.INTR < POS [+PST]	(Schumann Gálvez 1973: 27)
CHL	*-le*	ASSUM [+COM]	(Kaufman 1994, A 10: 59)
CHL	*-l-ek*	VER.INTR < POS [+SBJV]	(MacLeod 1987: fig. 15)
CHL	*-lec*	VER.INTR < POS [+EXH]	(Aulie and de Aulie 1978: 192)

Table 11: Ch'olan forms for the intransitive positional marker.

Intransitive positional marking is very uniform among all four Yukatekan languages (Table 12). As far as the incompletive and the subjunctive are concerned, to a large extent there is also a phonological congruence with the Ch'olan forms. While the incompletive shows the same deviating pattern as in Ch'olan, the other two can be segmented and exhibit the pYu **–l* positional marker (Kaufman 1994, A 10: 65). The *–aj* and *–ak* suffixes following are aspect markers (corresponding with preceding

[175] This intransitive form is derived by the *–n-a* of derived transitives via an intermediate *–bu ~ –ba* causative of positionals (Ch'orti' 2004: 151-152). In case the positional root has the form CV' or further suffixes follow, the vowel of the causative suffix likely gets elided (Ch'orti' 2004: 154). There is of course a semantic difference between the direct intransitivation of a positional root by *–wan* and the passivation of the causative positional.

[176] Smailus (1975: 193) refers in his grammar to positional marking that "[a]lgunos verbos crean una forma finita sólo con el incoativo. Son los así llamados 'verbos de estado': *cahtel*, 'establecerse', *chuntel*, 'sentarse' […]." The positional marking in CHN differs from the inchoative derivation, but in fact both suffixes share general common morphological features among other languages and may have developed from the same morphemes (see footnote 172 and Chapter 3.1.1.3).

aspect particles or prefixes) to inflect the verb (cf. Kaufman [1994, A 3a: 12, 16], Mora-Marín [2001: 54] for pM to pYu changes)[177].

While pGT still had pM status markers reflexes to indicate either plain/indicative or dependent/subjunctive status, pCh innovated their phonological differentiation for aspect as well (cf. Kaufman and Norman [1984: 92-94] for a development of the verbal system from pM to pCh). It is not impossible that the contact of pYu and pCh in a Central Lowland contact zone may have triggered the aspectual differentiation of pCh status suffixes.

For pYu, we might in a very straightforward way reconstruct incompletive *–*tal*, completive * –*l-aj-(i)* and subjunctive *–*l-ak*.

Idiom	Attestations		Sources
ITZ	*-tal*	VER.INTR < POS [+INC]	(Hofling and Tesucún 2000: 59)
ITZ	*-tal*	VER.INTR < POS [+INC]	(Hofling 1991: 28)
ITZ	*-tal*	VER.POS [+INC]	(MacLeod 1987: fig. 38)
ITZ	*-l-aj*	VER.INTR < POS [+COM]	(Hofling and Tesucún 2000: 59)
ITZ	*-l-ah*	VER.INTR < POS [+COM]	(Hofling 1991: 28)
ITZ	*-laj-ij*	VER.INTR < POS [+COM]	(Itza’ 2001: 106)
ITZ	*-l-ah-(i)*	VER.POS [+COM]	(MacLeod 1987: fig. 38)
ITZ	*-l-ak*	VER.POS [+SBJV]	(Hofling and Tesucún 2000: 59)
ITZ	*-l-ak*	VER.POS [+SBJV]	(Hofling 1991: 28)
MOP	*-tal*	VER.POS [+INC]	(Schumann Gálvez 1997: 113, 115)
MOP	*-tal*	VER.POS [+INC]	(MacLeod 1987: fig. 38)
MOP	*-tal*	VER.POS [+INC]	(Mopan 2001: 224)
MOP	*-tal*	VER.POS [+INC]	(Hofling 2011: 16)
MOP	*-l*	INTRS < POS	(Ulrich and Ulrich 1966: 263)
MOP	*-l[aj-*	ASSUM [+COM]	(Kaufman 1994, A 10: 59)
MOP	*-l-aj-(i)*	VER.POS [+COM]	(Schumann Gálvez 1997: 120)
MOP	*-l-ah-(i)*	VER.POS [+COM]	(MacLeod 1987: fig. 38)
MOP	*-l-aj-(i)*	VER.POS [+COM]	(Hofling 2011: 16)
MOP	*-l-ak*	VER.POS [+SBJV]	(MacLeod 1987: fig. 38)
MOP	*-l-ak*	VER.POS [+DEP]	(Hofling 2011: 16)
LAK	*-tar ~ -tal*	VER.POS [+INC]	(MacLeod 1987: fig. 29)
LAK	*-tar*	VER.POS [+INC]	(Kováč 2012: 1)
LAK	*-tal*	STAT	(Bruce 1968: 73)[178]
LAK	*-rah*	VER.POS [+COM]	(Kováč 2012: 1)
LAK	*-r-ah-(i)*	VER.POS [+COM]	(MacLeod 1987: fig. 29)
LAK	*-r-ak*	VER.POS [+SBJV]	(MacLeod 1987: fig. 29)
YUK	*-l-*	ASSUMP (all aspects)	(Kaufman 1994, A 10: 59)
YUK	*-t-al*	VER.INTR < POS [+INC]	(Smailus 1989: 31)
YUK	*-tal*	VER.INTR [+INC] (endowed)	(Tozzer 1921: 54-55)
YUK	*-tal*	VER.POS [+INC]	(MacLeod 1987: fig. 47)
YUK	*-tal*	VER.POS [+INC]	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 353)
YUK	*-tal*	VER.POS [+INC]	(MacLeod 1987: fig. 29)
YUK	*-l-(a)h-i*	VER.INTR < POS [+COM]	(Smailus 1989: 31)
YUK	*-l-ah*	VER.INTR [+COM] (endowed)	(Tozzer 1921: 54-55)
YUK	*-l-ah-(i)*	VER.POS [+COM]	(MacLeod 1987: fig. 47)
YUK	*-l-ah-(ih)*	VER.POS [+COM]	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 353)
YUK	*-l-ah-(i)*	VER.POS [+COM]	(MacLeod 1987: fig. 29)
YUK	*-l-ac*	VER.INTR < POS [+SBJV]	(Smailus 1989: 31)
YUK	*-tal-e*	VER.INTR [+SBJV] (endowed)	(Tozzer 1921: 70)

[177] For example, the pM particle *+*(a)j*, “earlier” became the pYu (transitive) completive marker *–*aj*, also with the perfective *–*m-aj* and possibly also among derived intransitives.

[178] The intransitive positional marking, despite the misleading description, is ensured by the example *č’ik’-tal*, “pararse, ponerse de pie” < *č’ik’–* “de pie, parado”.

YUK	*-l-ah-ik*	VER.POS [+SBJV]	(MacLeod 1987: fig. 47)
YUK	*-l-ak*	VER.POS [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 353)
YUK	*-l-ak*	VER.POS [+SBJV]	(MacLeod 1987: fig. 29)
YUK	*<´V_1>*	VER.INTR < POS	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 353)[179]

Table 12: Yukatekan forms for the intransitive positional marker.

Both TZE and TZO share many common forms with respect to stative and transitive (cf. Houston, Robertson and Stuart 2000: tab. 5) and celeritive derivation from positional roots (see below). With regard to a proper intransitivation from a positional root (Table 13), both languages feature two distinct patterns, going back to a common pTz origin. For pTz, we can reconstruct **<h>…-aj* that in turn reaches back to pGT, since it is supposedly found as well in Early Classic ClM (see above). The other is *–V_1*y*, on whose origin there is some debate (also Chapter 3.1.4.1). Robertson (2010: 8) also considers an origin reaching back to pGT, partly contradicting an earlier (Houston, Robertson and Stuart 2000: 331) reconstruction attempt pM **–er* > pGT **–ey* > pTz *–V_1*y*. An influence by the stative *–V_1*l* is proposed to have triggered the shift to a harmonic vowel. The intransitive positional marker for pGQ is also reconstructed as **–Vy* (Houston, Robertson and Stuart 2000: tab. 5), thus a pWM origin may possible[180].

For TZE, we can reconstruct the following phonological process: pTz *–V_1*y* > Colonial TZE –V_1*y* until modern TZE discontinues to use this suffixes to solely feature the second derivation in *<h>…-aj* (Robertson 2010: 10, tab. 6). While *<h>…-aj* was already lost in Colonial TZO, the alternate form undertook the following process: pTz –V_1*y* > Colonial TZO *–ey* > modern TZO *–i* (Robertson 2010: fn. 6), thus also featuring an [e] > [i] shift. The process of –V_1 > *–e* and *–i* is also visible not only in TZO, but also other cases, such as the Ch'olan root transitive thematic (Chapter 3.1.3.1) demonstrates (Robertson 2010: 8), although exceptions occur (e.g. CHL completive). In parts, this also accounts for the Ch'olan intransitive marker (Chapter 3.1.4.1) which developed a preponderance to *–i(y)* instead of –V_1*y* among modern languages.

The intransitivation of a positional root to obtain a celeritive verb to express any kind of (sudden) motion is very uniform with a general *–C'-{i, u}j* pattern. The pTz form **-¢aʔax* only finds its reflex in modern TZO *–tzaj.*

Idiom	**Attestations**		**Sources**
pTz	**<h>…-ax*	VER.INTR < POS (productive)	(Kaufman 1972: 141)
pTz	**-Vy*	INTRS	(Kaufman 1972: 142)

[179] The stem formation follows the morphophonemics of a mediopassive, except that a positional root functions as the derivational basis. Unlike genuine intransitive positionals, these forms are also inflected with the same status suffixes as mediopassives (Table 47).

[180] It might be an innovation when following Kaufman's (1994, A 10: 65) data. He reconstructs EM 'assumptive' as **–e-7b'* which in fact could lead back to a pM *–e* ~ *–i:7* suffix (competing with **–le*). Many modern EM languages (Houston, Robertson and Stuart 2000: tab. 5) have *–e'*, *–e:'* or *–a'* (considering the same [e] > [a] shift, see footnote 173), while notably IXL retains *–{a, e}b'* and SAK has –V_1*b'*. However, Kaufman rather sees a pWM *#–iH* (as a reflex to the *–i:7* allomorph) as the origin of the TZO and POP forms. Again, it involves a sound shift to a harmonic vowel, but as SAK shows, it is applicable. The same accounts for other suffixes and their reconstruction, e.g. the root transitive marker (Chapter 3.1.3.1). There might ultimately have been processes of a double shift from **–V* > *–V_1 > *–V*, whereas the fix vowels of stages one and three are not necessarily the same.

pTz	**-p'ix ~ -p'ux*	VER.INTR < POS	(Kaufman 1972: 141)
pTz	**-¢'ix ~ -¢'ux*	VER.INTR < POS	(Kaufman 1972: 141)
pTz	**-č'ix ~ -č'ux*	VER.INTR < POS	(Kaufman 1972: 141)
pTz	**-k'ix ~ -k'ux*	VER.INTR < POS	(Kaufman 1972: 141)
pTz	**-¢aʔax*	VER.INTR < POS	(Kaufman 1972: 141)
TZE	-V_1*y*	VER.INTR < POS	(Ara 1986: 25v)[181]
TZE	-V_1*y*	INTRS (ingressive)	(Kaufman 1971: 59)
TZE	*<h>…-ah*	VER.INTR < POS	(Slocum 1948: 83-84)[182]
TZE	*<h>…-ah*	VER.INTR < POS	(Kaufman 1971: 53)
TZE	*<h>…-aj*	VER.INTR < POS	(Hinmán Smith n.d.: 122)
TZE	*<h>…-an ba*	VER.POS [+REFL]	(Slocum and Gerdel 1971: 99)[183]
TZE	*-{p',c', č',k'}-Ṽh*	VER.INTR < POS	(Kaufman 1971: 51-52)
TZE	*-{b,k',č',c'}-uh*	VER.INTR < POS	(Slocum 1948: 84)
TZE	*-caʔah*	VER.INTR < POS	(Kaufman 1971: 52)
TZO	*-ey*	VER.INTR < POS	(Laughlin 1988, I: 286)[184]
TZO	*-i [-h-…-aj]*	ASSUM	(Kaufman 1994, A 10: 60)
TZO	*-i*	VER.INTR < POS	(Laughlin 1975: 23)[185]
TZO	*-i*	INTRS	(García de León 1971: 25)
TZO	*-i*	VER.INTR < POS	(Haviland 1981: 240, 366)
TZO	*-i*	INCH < POS	(Haviland 2007: xxv)
TZO	*-i*	characteristic stance	(Cowan 1969: 100)
TZO	*-{k',p'}-Vj*	VER.INTR	(García de León 1971: 25)[186]

[181] There is only lexical evidence for this positional marking, Ara provides <*chubuyon, qchuban* asentarse>, the positional base is clearly visible by the adjectival <*chubul* asentado>. Houston, Robertson and Stuart (2000: 332) provide further additional Colonial TZE evidence, such as *chot-ol*, "squatting" vs. *chot-oy*, "to squat".

[182] The infix is not always present, and for transitive stems the rule is [h] > [Ø] / CV__{m, n, h, s, b, l, ʔ} (Slocum 1948: fn. 20). The same rule also seems to apply for transitive roots (Hinmán Smith n.d.: 122).

[183] Compare the use of the positional roots *huc* and *huts* in the following (segmented) contexts: *la s-hu<h>c-an s-ba* and *la s-hu<h>ts-an s-ba* 'COM 3SG.ERG-sit<VERB>-CAUS 3SG.ERG-REFL', "se sentó" with the adjectival positional *huc-ul* and *huts-ul* 'sit-ADJS', "sentado". Pineda (1887: 221) calls this a "verbo reciproco" in his conjugation paradigms, e.g. with "*Johon yag metzang-bag* – Yo me acuesto". Kaufman (1972: 141) provides pTz **-h- -an* to derive a transitive from a positional root (i.e. causative). Despite the oblique recipient of the action, which makes it almost an intransitive expression (Haviland [1981: 312-313] on morphologically parallel TZO reflexives), the construction is morphosyntactically indeed a transitive form. It is the 'self' as the patient that is caused to undergo the action by the agent, although both are the same. The reflexive positional does not necessarily need to refer back to the self as the patient, as the TZO *čotan ba*, "be confined /at home, unable to leave/" < *čot*, "sit" (Laughlin 1975: 125) shows. Generally, also because of the <*h*> derivation (?), this construction may be considered as a reflexive mediopassive of positional roots (see Chapter 3.1.4.2).

[184] Haviland (1988) in his grammatical overview of Colonial TZO does not mention *–ey* (otherwise the passive marker, see Table 8). Lexical evidence provides *nakey*, "be seated, inhabit, reside, sit down" with clear intransitive positional marking when compared to the stative *nakal*, "residing, seated, sitting" and the celeritive *naktzaj*, "be dammed up, stop moving". The suffix vowel is invariable, compare to *javey*, *kikey* or *kotey* (Laughlin 1988, I: 207, 220, 224). In modern TZO, the corresponding forms are *naki*, *havi*, *kiki* and *koti* (Laughlin 1975: 247, 148, 173, 178).

[185] For example *čoti*, "sit down, be settled" < *čot*, *¢avi*, "stand up (hair)" < *¢av*, *me¢i*, "lie (wood, sugarcane)" < *me¢* (Laughlin 1975: 89, 125, 233).

[186] Some examples of an intransitive *–C-Vj* derivation are provided, from which *–puch'-k'-ij*, "caerse de fatiga" and *–nuj-p'-ij*, "caerse de boca" are based on positional roots. Another example that shows a suffixation reconstructed for pTz is *–bal-ch'-uj*, "enrollar" which is derived from a transitive. Other derivations feature other *–C* suffixes, such as *–p'it-l-uj*, "atemorizarse" and also do not refer to the act of taking a position. The corresponding pTz suffixes by their structure represent celeritive forms rather (also see Tables 6 and 7 for Ch'olan and Yukatekan cognates). While *–C* thus represents the proper intransitiviser, *–Vj* may represent the relict of a thematic. While celeritives only appear as a valency-decreasing mechanism in the aforementioned languages, Tzeltalan also allows positional roots to be the base. Kaufman (1994, A 4a: 14, 41, 52-55) additionally provides TZE celeritives *–{p('), k', tz', ch'}-u-j* to be derived from both transitives and positionals. The restriction to positional roots as the derivational basis for pTz (Kaufman 1972: 141) is thus done in error (also see Chapter 3.1.4.1). Kaufman also theorises pM celeritive (as mere detransitiviser) suffixes *–l* and *–ch'*, supposedly on this evidence (also see CHJ in Table 14). The proper intransitive positional in pTz therefore in fact is only **<h>…-aj*, as celeritives refer to sudden changes of state and exhibit some special semantics. The different derivations do not necessarily seem to exhibit varying meanings, as *čotk'ih ~ čotp'ij*, "sit down unexpectedly" show, but compare with *čótlih*, "falling

TZO	*-C-{i,u}x*	VER.INTR < POS	(Cowan 1969: 98-99)
TZO	*-p'ij*	INTRS	(Haviland 1988: 85)
TZO	*-ch'uj*	INTRS	(Haviland 1988: 85)
TZO	*-tzaj*	INTRS	(Haviland 1988: 85)
TZO	*-t'š*	VER < POS (roll-over motion)	(Cowan 1969: 108)
TZO	*-p'*	VER < POS (revolve motion)	(Cowan 1969: 108)
TZO	*-k'*	VER < POS (turn motion)	(Cowan 1969: 108)

Table 13: Tzeltalan forms for the intransitive positional marker.

The positional inflection and derivation in Greater Q'anjobalan represents itself very inhomogeneous (Table 14). A common *–an* stative positional marker is shared by all languages and is cognate to Ch'olan, Yukatekan and Tzeltalan *–Vl*. However, there is evidence from CHJ, TOJ and POP that it also may be used as verbs (see footnote 202), but this feature has not been described for other members of the Greater Q'anjobalan branch.

There seem to be two distinct Greater Q'anjobalan intransitivisers of positional roots. One can be assumed to be **–(V)y*, as evidenced by QAN and POP[187]. For all other languages, no such suffix has been described. The second one is **–(l)-(V)j ~ *–(l)-(V)x*, as it is found in CHJ and QAN. It seems to be formed out of an *–l* intransitiviser (see footnote 190) and a *–(V)j* thematic of derived intransitives. CHJ and QAN also features the same pattern as with the passivation, again pointing out the close (semantic) relation between both forms, at least when the action of placing is resultative or telic[188].

A third kind of derivation concerns celeritive verbs which also follow a general **–C(')-* pattern, these are attested in CHJ, TOJ, QAN, POP and MCH. Morphologically and phonologically, they appear cognate to pTz celeritives of positional roots (Table 13) and pCh forms from transitive roots (Table 6), the latter acting as mediopassives.

Some isolated derivational morphemes for intransitive positionals appear in some languages. Only **–l-Vj* and the celeritive **–C(')-Vj* forms show relevance to the cases known from Classic Mayan. The latter are reflexes of pM (Kaufman 1994, A 4a: 52-55) and, as stated above, serve as intransitivisers in LL and some EM languages. The forms in **–l-Vj* are however not considered as cognates to LL forms (Kaufman 1994, A 10: 59).

Idiom	**Attestations**		**Sources**
CHJ	*-xi ~ -ji*	VER.INTR < POS	(Domingo Pascual 2007: 193)
CHJ	*-chaj*	VER.INTR < POS	(Domingo Pascual 2007: 193)
CHJ	*-chaj(i)*	VER.INTR < POS	(García Pablo and Domingo Pascual 2007: 144)
CHJ	*-an*	VER.INTR < POS	(García Pablo and Domingo Pascual 2007: 108)[189]

suddenly on one's butt" (Laughlin 1975: 125). See Laughlin (1975: 26) for a brief semantic overview on the semantics of positional derivations. Also refer to footnote 128 for the relation of pTz intransitive positional and the emergence of pCh passive formation.

187 Especially for members of the GQa branch, grammars tend to include the final thematic *–i* of intransitive verbs (> *–Ø* / …) with the derivational morpheme. The example of CHJ *–xi ~ –ji* (Domingo Pascual 2007: 193) therefore is *–x-(i) ~ –j-(i)* rather. The same observation applies for the inchoative and antipassive.

188 Compare for example *linh-xi ~ linh-chaji*, "fue parado" with *ix-ach-linh-lji*, "te paraste" (Domingo Pascual 2007: 193, 194).

189 While *–an* in CHJ is, like in all other GQa languages, the marker for positional adjectives and stative functions (García Pablo and Domingo Pascual 2007: 107, 142-143), at least in San Mateo Ixtatán the suffix can also be

CHJ	*-an*	VER.INTR < POS	(Buenrostro Díaz 2009: 50, 164-165)
CHJ	*-l-ax ~ -l-an*	VER.INTR < VER.TR,POS	(Hopkins 1967a: 85)[190]
CHJ	*-lji*	VER.INTR < POS	(Domingo Pascual 2007: 194-195)
CHJ	*-n-ax*	VER.INTR < POS	(Hopkins 1967a: 83-84)[191]
CHJ	*-laj(i) ~ -naj(i)*	VER.INTR < POS	(García Pablo and Domingo Pascual 2007: 144)
CHJ	*-k'-(an)-ax*	VER.INTR < POS	(Hopkins 1967a: 83)[192]
CHJ	*-b'i*	VER.INTR < POS	(Domingo Pascual 2007: 194-195)
CHJ	*-b'i*	VER.INTR < POS	(García Pablo and Domingo Pascual 2007: 144)
CHJ	$-VC_2$	VER.INTR < POS	(Hopkins 1967a: 90)
TOJ	*-l*	VER.INTR < POS,VER.TR	(Furbee-Losee 1976: 66)[193]
TOJ	*-{b,m}-an*	VER.INTR < POS,VER.TR	(Furbee-Losee 1976: 67-68, 70-71)
QAN	*-ay*	VER.INTR < POS	(Q'anjob'al 2005: 121)
QAN	*-ay*	VER.INTR < POS	(Francisco Pascual 2007: 37)
QAN	*-loji*	VER.INTR < POS	(de Diego Antonio et al. 2001: 26)
QAN	*-loj*	VER.INTR < POS	(Francisco Pascual 2007: 45-46)
QAN	*-k'oj*	VER.INTR < POS	(Francisco Pascual 2007: 42)[194]
QAN	*-jon*	VER.INTR < POS	(Q'anjob'al 2005: 121)
QAN	*-x-i*	VER.INTR < POS	(Martin 1977: 242-244)[195]
QAN	*-x*	VER.INTR < POS	(Q'anjob'al 2005: 121)
QAN	*-an*	ADJ < POS	(Q'anjob'al 2005: 121)
QAN	*-an*	ADJ < POS	(Francisco Pascual 2007: 68)
QAN	*-an*	POS THEM	(Mateo Pedro 2010: 24)[196]
QAN	*-an*	POS THEM	(Martin 1977: 208)
AKA	*-an*	POS THEM	(Méndez Martinez 2004: 140)[197]

used for intransitive forms, e.g. *ix-in-em-kum-an*, "me hinqué" < *kum*, "hincar" or *ix-Ø-k'exw-an*, "se levantó ella" (Buenrostro Díaz 2009: 50). Also, auxiliary constructions appear, e.g. *ix-Ø-em k'oj-an waj Xun sat lu'um* 'COM-3SG.ABS-bajar sentarse-POS CLF Juan cara tierra', "Juan se sentó en el suelo" (Buenrostro Díaz 2009: 202).

[190] The *–l* is described as an intermediate transitiviser (thus unlike the Ch'olan *–l* morpheme), while the proper intransitive formation is supposed to be achieved by the following suffix. While *–an* is the CHJ and general GQa positional stative (see footnotes 197 and 202), it is also used to with the resulting intransitive that originates from a transitive root, e.g. *p'ák-l-an-(ih)*, "to wash hair" < VER.TR.R *p'ák*. Also refer to footnote 420 for its use among instrumental formation. Judging on the environments it appears in, I would not concur with Hopkins (1967a: 85) to consider it as a transitive stem formation suffix, but a proper intransitiviser, exactly as the Ch'olan *–l* functions. But in CHJ, it is not exclusively for positional roots, as well in other languages, such AKA (Akateka 2007: 167, 197). Therefore, *–ax* and *–an* can be considered as thematic suffixes, whereas CHJ *–l-ax ~ –l-ji* (described as an inchoative [Domingo Pascual 2007: 194-195]) is cognate to ECh *–l-aj* (and obviously QAN and AKA as well).

[191] This derivation also includes the paradigmatic *k'óx-n-ax-(ih)*, "to be seated" < *k'óx*, "seated". It is furthermore used with onomatopoetic (affective) roots. Also compare to POP *–x-on* (footnote 201). It may be possible that this form originates from the syncopated *–an*. Hopkins (1967a: 84) additionally provides $-V_1$*l-x-(up')* and $-C_1$*-on* as intransitivations of positional roots, but the paradigmatic examples are not overly overt to support this analysis. Another intransitiviser used with positional roots is *–p'* (see footnote 215), but not to result in an intransitive from these, but only to further derive a noun.

[192] This derivation, apparently cognate to pTz and TZO celeritives and POP and QAN intransitives (see footnote 200), derives a positional stative with *–an* to express "to act like X" via an intermediate "to be X". Compare to *láN-an-k'-ax-(ih)*, "to be busy" < *láN-an* < *láN*, "busy". This intermediate process is however not mandatory, cf. *páč-k'-ax-(ih)*, "to be flat" < *páč*, "flat sheet".

[193] TOJ features several intransitivisers of transitive, but also positional roots, some of them used as inchoatives/celeritives. These are usually followed by an intransitive stem formation suffix *–an ~ –Vn*.

[194] By the examples provided (e.g. *maxin telk'oji*, "me caí") we can assume a celeritive cognate to CHJ and POP, as well as pTz and TZO.

[195] This suffix derives an intransitive with an iterative meaning from a positional root and requires the stem formative *–i*, e.g. *kutz-x-i ek'oq*, "a fat person walks around" < *kutz*, "fat".

[196] Positional roots, judging by the absence of aspectual marking (Mateo Toledo 2008: fn. 9), are rather treated as non-verbal statives in QAN, thus similar to AKA and POP, involving an auxiliary construction. Nevertheless, semantically it can be considered intransitive, as it describes a state of being (footnote 40). Danzinger (1996) further elaborates this case for MOP, showing how positional statives show semantic similarity to intransitives as per their case-role marking, although MOP achieves this without an additional existential verb. For QAN, a recent case study (Mateo Toledo 2012) has also demonstrated the use of stative positionals as the secondary predicate in finite monoclauses, as well dealt with for other Mayan languages (Aissen and Zavala Maldonado 2010).

AKA	*-an*	POS THEM	(Zavala Maldonado 1992b: 35)
AKA	*-an*	POS THEM	(Zavala Maldonado 1992a: 142, 183, 207, 218, 221)
AKA	*-an-(oj)*	VER.INTR < POS	(Akateka 2007: 209-210)[198]
POP	*-Ø-(i) ~ -y-(i)*	VER.INTR < POS	(Day 1973: 42-43, 45)[199]
POP	*-i*	VER.INTR < POS	(Popti' 2001: 171)
POP	*-y*	VER.INTR < POS	(Stratmeyer et al. 1966: 213)
POP	*-y*	VER.INTR < POS	(Delgado Rojas et al. 2007: 109)
POP	*-y*	VER.INTR < POS	(Ross Montejo and Delgado Rojas 2007: 49)
POP	*-q'oh ~ -q'ah*	VER.INTR < POS (some)	(Ross Montejo and Delgado Rojas 2007: 54)[200]
POP	*-x-(i) ~ -ex-(i)*	REPET < POS	(Day 1973: 45)[201]
POP	*-x*	REPET < POS	(Delgado Rojas et al. 2007: 110)
POP	*-an*	POS THEM	(Day 1973: 29)[202]
POP	*-an*	STAT < POS	(Stratmeyer et al. 1966: 213)
POP	*-an*	STAT < POS	(Popti' 2001: 169-171)
POP	*-an*	STAT < POS	(Delgado Rojas et al. 2007: 109)
POP	*-an*	POS [+$_{\text{PREDICATE}}$]	(Ross Montejo and Delgado Rojas 2007: 69)
MCH	*-{q',p',tz('),t}*	VER.INTR < POS	(Palosaari 2011: tab. 5.6)[203]
MCH	*-w-i*	VER.INTR < POS	(Palosaari 2011: 128)
MCH	*-a(:)n*	POS THEM	(Palosaari 2011: 128, 166-168)[204]

Table 14: Greater Q'anjobalan forms for the intransitive positional marker.

[197] Like QAN and POP (footnote 202), AKA uses stative forms to express an intransitive positional with preposed auxiliary construction involving the aspect prefix, pronoun and suffixed by the deictic enclitics *=ey*, *=aa*, *=kan* (Akateka 2007: 209, Méndez Martinez 2004: 85-87, 140), e.g. *ʂ̥-Ø=ʔey wox-an nax šunik* 'COM-3SG.ABS-DIR sentado-POS hombre Juan', "Juan se sentó" (Zavala Maldonado 1992a: 207). The actual act of placing, e.g. *ʂ̥-Ø-s-wox-b'a*, 'COM-3SG.ABS-3SG.ERG-sentado-CAUS', "[él] sentó", can also be described with the causative *–b'a* suffix, potentially followed by the directionals *=a'aj* or *=eyoj* (Méndez Martinez 2004: 140). Positional stems formed by *–an* can further be derived by certain intransitivisers, such as the *–b'* inchoative (cf. Zavala Maldonado 1992b: 36-38)

[198] The circumstances for the suffix *–oj* are not clearly described and two scenarios seem plausible. It is either optional or is only mandatory when the agent is not 1SG.ABS (where replaced by the enclitic *–an*), compare *ch-in-'aa lin-an-an*, 'INC-1SG.ABS-DIR stop-THEM-ENCL' as "me paro" with *x-ach-'ey chot-an-oj*, 'COM-2SG.ABS-DIR sit-THEM-THEM' as "te sentaste". This suffix appears to function as a thematic for derived intransitives, compare to CHJ and QAN *–l-(a)j(i)* forms.

[199] The use of the zero morpheme is restricted to positionals denoting the position of the human body. Otherwise, only a few noun roots feature this suffix in a non-productive environment (Day 1973: 42). It resembles TZO intransitive positional marking (Table 13). Otherwise, *–y* is the standard derivational morpheme to form an intransitive positional stem, e.g. *chachc'oŋyi*, "you crouch" < *c'oŋ* (Stratmeyer et al. 1966: 213).

[200] This form seems cognate to the pTz and TZO celeritive and CHJ and QAN intransitive derivation from transitives and positionals (see footnote 186). For the correspondence of Qa [q'] and other LL [k'] and their origin of pM [k'ʷ], see Fox (1978: tab. 14).

[201] This suffix can also be attached to onomatopoetic roots. The *–ex* allomorph is used when a consonant-initial suffix follows. Occasionally, the repetitive *–on* suffix is suffixed, while it does not change the lexical class any further (Day 1973: 45).

[202] Except the *–y-(i)*, Day interestingly describes no additional derivations of positional roots into other verbal classes, but positionals with the *–an* suffix also function as transitive verbs (Day 1973: 25) and also as stative (adjectival) positionals (Stratmeyer et al. 1966: 213), e.g. *tz'ön-an-ach*, "you are seated" (Day 1973: 29). Additionally, there is also a causative *–b'a* suffix (Ross Montejo and Delgado Rojas 2000: 86). The suffix otherwise seems cognate to CHJ and causative in TZE and TZO. An *–l* intransitiviser (Ross Montejo and Delgado Rojas 2007: 46) is functionally different to derive intransitives from nominal roots, thus similar to *–t* that derives transitives from nouns in YUK (see footnote 82), but also CHJ (Hopkins 1967a: 84) and TOJ (Supple and Douglass 1949: 171).

[203] These intransitivisers from positional (and sometimes transitive) roots feature a cognate set to Tzeltalan forms (Table 13), but also to celeritive derivation among Ch'olan and Yukatekan (Tables 6 and 7). The suffixes are described as non-productive and Palosaari provides no examples of their usage or suffixes to follow (see footnote 186 for TZO examples).

[204] This suffix is said to rather derive adjectives from positional roots, although it might be related to the *–:n* mediopassive suffix. Nevertheless, the derived forms can function like predicates, albeit their possibility to be inflected with aspect prefixes.

Only the Early Classic cases and Tzeltalan vernaculars will be included among the test cases and investigated for their orthographic realisation. As none of the Ch'olan or Yukatekan cases is vowel initial, none of the suffixes can be used for the showcases, also considering that they became an indispensable unit with no internal vowel change to be expected.

The relevant linguistic evidence from the Tzeltalan branch needs to be split up into two test groups because of the twofold derivations possible. Based on the evidence from Colonial times, both can be supposed to appear in Classic times inscriptions, an assumption supported by epigraphic evidence.

Adhering to test group one is the *<h>…-aj* pattern, which is only attested in modern TZE, but therefore reconstructable for pTz from this direction. As we also have Early Classic evidence from the Central Lowlands (Houston, Robertson and Stuart 2000: 333, tab. 5, fig. 4, Lacadena 2004b: 169-170), we can assume a reflex of this from in pCh from pGT. At some point before *Bak'tun* 9, this form disappeared from the Ch'olan branch and only *–laj* stayed in use. For both the pTz and pCh evidence, we may assume an orthographic realisation that is similar or identical to the spelling patterns root transitive passives. As neither pTz nor pCh exhibit long vowels (see footnote 109), a synharmonic **Ca=ja / __#** spelling in the texts is assumed. Morphophonemic alterations have not yet been described for the suffix, and are not assumed for ClM, although spelling alterations are known when other suffixes follow.

The proper Tzeltalan *–V_1y* suffix[205] is attributed to control group 2. The vowel harmonic form can be determined to appear as a vernacular form in the hieroglyphs. It continued from pTz into Colonial TZE and the TZO shift to *–ey* is only attested from Colonial times on, thus it is a later development.

The linguistic evidence from the Ch'olan sub-group with the completive aspect in *–l-aj* (except CHR which also exhibits it in the incompletive) finds its mirroring in ClM, from which only one example in the incompletive *–tal* is known. This supports Wald (cf. Bricker 2000a: 182) that the hieroglyphic inscriptions overall feature the completive aspect.

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-tal*	**CV$_1$-CV$_1$=ta-la / CV$_1$C(-CV$_1$)=ta-la**	-
	√<h>-aj	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√<h>-[a]j	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	√-le	**CV$_1$-CV$_1$=le / CV$_1$C(-CV$_1$)=le**	-
	√-laj	**CV$_1$-CV$_1$=la-ja / CV$_1$C(-CV$_1$)=la-ja**	-
	√-wan	**CV$_1$-CV$_1$=wa-ni / CV$_1$C(-CV$_1$)=wa-ni**	-
Eastern Ch'olan	n/a		
Western Ch'olan	** √-le(y)*	**CV$_1$-CV$_1$=le(-yV) / CV$_1$C=le(-yV)**	-

205 See footnote 66 for a possible example. There are too few unambiguous spellings to predict a specific **yV** syllable. As in the example from TRT Jd. 1, A6, it might be synharmonic with the root, but also a disharmonic pattern is possible, especially with **yi**, considering the shared evolution between the intransitive positional and the versive (see Chapter 3.1.4.1 and footnote 168). Also note that positional and transitive roots frequently blur in terms of suffixation (Wichmann 2002a: 7-8), hence a mediopassive can also be analysed.

Yukatekan	** √-tal*	**CV$_1$-CV$_1$=ta-la / CV$_1$C(-CV$_1$)=ta-la**	-
	√-l-aj(-i)	**CV$_1$-CV$_1$=la-jV / CV$_1$C(-CV$_1$)=la-jV**	-
Tzeltalan	*√<h>-aj*	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√<h>-[a]j	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	√-V$_1$y	**CV$_1$-CV$_1$=yV / CV$_1$C-CV$_1$=yV**	1.a,b,c,d.i
		CV$_1$C=V$_1$-yV	1.e.i
	√-[V$_1$]y	**CV$_1$-CV$_2$=yV / CV$_1$C(-CV$_2$)=yV**	2.a,b,c,d.i (2.e.i)

Table 15: Representative, linguistically induced spelling patterns on junctures to be expected for the intransitive positional marker among Ch'olan, Yukatekan and Tzeltalan.

3.1.1.3 – Inchoative Suffix *–aj ~ –Vj ~ –j*

As already stated in Chapter 3.1.1.2, the passive and the intransitive positional share common features. The inchoative (sometimes also called versive when used in an intransitive sense) might also be added (see footnote 172), at least as far as the Ch'olan, Yukatekan and Tzeltalan branch are concerned (for the latter two see below). For Ch'olan (Table 16), Kaufman and Norman (1984: 109) consider the ECh **–l* inchoative cognate with the WCh passive **–le* which both ultimately derive from the pCh **–l* intransitiviser of positionals. What Kaufman (1994, A 4b: 51) terms 'Versive 2' derives from pM **–er* in his reconstruction (where I consider pM [r] > WM [l] with a drop of the vowel).

For the Ch'olan branch, two general forms can be made out. The WCh pattern is *–C-a(')n ~ –C-al* in the incompletive and *–C-a(') ~ –C-i(')* in the completive (with C = {/', l, m, n, b, p, t/}). In ECh, the pattern is different. Only CHR adheres to the WCh pattern in that we find incompletive *–C-an* and completive *–C-a* (C = /r, t, ch/). In CHT, we have *–C-aw* (C = {/l, m, t/}), suffixing an aspect marker (*–el* [+INC], *–Ø* [+COM], *–ik* [+SBJV]). This deviation from the three other languages is further proof of Wichmann's (2002a) arguments that CHT cannot be ancestral to CHR. Common to all is the initial consonant, which is mostly /l/ ~ /r/ and related to the **–l* intransitiviser of positionals. MacLeod (1987: fig. 15) however also notes a *–l-aw-el* in CHL, which might be the result of diffusion.

The inchoative with *–b*, which is shared in WCh, might be considered as a reflex of pM 'Versive 1' (Kaufman 1994, A4b: 48, 50) and/or be the result of diffusion from neighbouring Tzeltalan. When considering the inchoative, passive and intransitive positional sharing the same origin, we might also take pM **–o-t ~ *–a-t* bounded passive into account[206].

The idea that the *–aj* suffix has an in inchoative function in ClM, was first proposed by MacLeod (1984: 238), and the verbalising function of *~ –aj* was elaborated by Lacadena (2003). Many "changes-in-state" (Houston, Robertson and Stuart 2001b: 42) discussed so far in ClM concern colour terms, which are known to feature a slightly different pattern (see footnotes 208 and 217). In CHR for example, we have them with *–aj* only, e.g. *sakah*, "[…] become dawn, lighten [as the sky]" (Wisdom 1950: 625), but other inchoatives with *–Vj*, e.g. *ak'bareh*, "become night, get dark" (Wisdom 1950: 450) or *takih*, "be dry, dry up" (Wisdom 1950: 660). In fact, CHR is the only Ch'olan language to feature an exclusive *–a(j)* pattern with colour terms only.

[206] This is suggested by data compiled by Kaufman (1994, A4a: 47). He considers the *–t-al* of the incompletive versive and/or passive in YUK, CHN and CHL to reflexes of the pM bound passive.

Idiom	Attestations		Sources
pCh	n/a		
ECh	**-l*	INCH	(Kaufman and Norman 1984: 109)
CHT	*-l-aw-el*	INCH < NOUN,ADJ [+INC]	(MacLeod 1987: fig. 5)
CHT	*-l-aw-el*	INCH < NOUN,ADJ [+INC]	(Sattler 2004: 370)
CHT	*-ta-el*	INCH [+INC]	(MacLeod 1987: fig. 5)
CHT	*-m-a(h)-el*	INCH [+INC]	(MacLeod 1987: fig. 5)
CHT	*-m-i-y-el*	INCH [+INC]	(MacLeod 1987: fig. 5)
CHT	*-law*	INCH < ADJ	(Robertson, Law and Haertel 2010: 166)
CHT	*-l-aw*	INCH < NOUN,ADJ [+COM]	(MacLeod 1987: fig. 5)
CHT	*-l-aw*	INCH < NOUN,ADJ [+COM]	(Sattler 2004: 370)
CHT	*-l-aw-ik*	INCH < NOUN,ADJ [+SBJV]	(MacLeod 1987: fig. 5)
CHT	*-l-aw-ik*	INCH < NOUN,ADJ [+SBJV]	(Sattler 2004: 370)
CHR	*-i*	VERB < NOUN	(MacLeod 1987: fig. 5)
CHR	*-(a)r-an ~ -l-an*	VERB < NOUN,ADJ	(MacLeod 1987: fig. 5)
CHR	*√R AN*	INCH < ADJ	(Fought 1967: 150)
CHR	*-ran*	VERB < ADJ	(del Moral 1988: 419)
CHR	*-ran*	VERS < ADJ	(Wichmann 1999: 145)
CHR	*-ran*	VERS < ADJ	(Pérez Martínez 1996: 36-37)
CHR	*-ran*	VERS < ADJ	(Ch'orti' 2004: 146-147)[207]
CHR	*-(t)ujra*	VERS < ADJ	(Ch'orti' 2004: 147)[208]
CHR	*√A*	INCH < ADJ	(Fought 1967: 150)
CHR	*-a*	VERB < ADJ	(MacLeod 1987: fig. 5)
CHR	*-ta*	VERB < NOUN,ADJ	(MacLeod 1987: fig. 5)
CHR	*-č-a ~ -č-V*	VERB (uncommon)	(MacLeod 1987: fig. 5)[209]
CHR	*-ch-a*	INCH < various roots	(Wichmann 1999: 133-134)
CHN	**-ah*	VERB	(MacLeod 1987: fig. 15)
CHN	*-a(n)*	INCH < ADJ,NOUN,PTCP,CLF	(Knowles 1984: 101-102)
CHN	*-ʔa-n*	INCH [+INC]	(MacLeod 1987: fig. 15)
CHN	*-ʔ*	INCH < ADJ	(Knowles 1984: 98)
CHN	*-'*	VERB < ADJ	(Keller and Luciano 1997: 458)
CHN	*-n*	INCH < ADJ,NOUN (certain)	(Knowles 1984: 99)
CHN	*-n-an*	INCH [+INC]	(MacLeod 1987: fig. 15)
CHN	*-m*	VERB < ADJ	(Keller and Luciano 1997: 458)
CHN	*-m-an*	INCH [+INC]	(MacLeod 1987: fig. 15)
CHN	*-m-i*	INCH [+COM]	(MacLeod 1987: fig. 15)
CHN	*-p*	INCH < ADJ (with *-Vl* form)	(Knowles 1984: 100)
CHN	*-p*	VERB < ADJ	(Keller and Luciano 1997: 458)
CHN	*-p-an*	INCH [+INC]	(MacLeod 1987: fig. 15)
CHN	*-p-i*	INCH [+COM]	(MacLeod 1987: fig. 15)
CHN	*-t-i*	INCH [+COM]	(MacLeod 1987: fig. 21)
CHN	*-iʔ*	INCH [+COM]	(MacLeod 1987: fig. 15)
CHL	**-ah*	VERB	(MacLeod 1987: fig. 15)
CHL	*-(ʔ)an*	INCH [+INC]	(Kaufman and Norman 1984: 102)
CHL	*-ʔa-n*	INCH < ADJ [+INC]	(MacLeod 1987: fig. 15)
CHL	*-7-a-n*	INCH < NOUN, ADJ [+INC]	(Kaufman 1994, A 4b: 50)
CHL	*-an*	INTR < VERB [+STAT] [sic!]	(Warkentin and Scott 1980: 77)
CHL	*-añ*	INCH < ADJ	(Vázquez Alvarez 2002: 115)
CHL	*-(m)an*	VERB < NOUN (unmarked)	(Attinasi 1973: 217)

[207] There is also a passivation of a causative form possible, e.g. *nojta'resna*, "fue engrandecido" (Ch'orti' 2004: 148). But this detransitivised inchoative of course has a different meaning involved than the plain inchoative directly derived from an adjectival root.

[208] The only two examples given are connected to colour terms: *sak'ujra*, "[s]e emblanqueció" and *yaxtujra*, "[s]e puso morado". However, as *yaxaxran*, "se enverdeció" shows, the regular *–ran* does also occur with colour terms, thus there is no inchoative restricted to colour terms, as we e.g. know it from CHJ (see footnote 217). But compare with the VER.INTR *sub'ajra*, "avergonzar[se]" < *sub'ar*, "pena, vergüenza" (Pérez Martínez 1996: 189-190).

[209] Examples for this inchoative from a nominal basis are *chinchah*, "tremble, shake, rustle (as leaves), vibrate, throb, wiggle (as worms), rattle, sway back and forth" < *chin*, "rattle, trembling or shaking, throbbing, chill" (Wisdom 1950: 701-702) or *ja'cha*, "dissolve" (in the sense of disperse, melt) < *ja'*, "water" (Hull 2005: 53).

CHL	*-(ʔ)a*	INCH [+COM]	(Kaufman and Norman 1984: 102)
CHL	*-ʔa*	INCH < ADJ [+COM]	(MacLeod 1987: fig. 15)
CHL	*-7-a*	INCH < NOUN,ADJ [+COM]	(Kaufman 1994, A 4b: 50)
CHL	*-l-ʌw-el*	INCH < ADJ [+INC]	(MacLeod 1987: fig. 15)
CHL	*-tʌl(-el)*	INCH < ADJ [+INC]	(MacLeod 1987: fig. 15)
CHL	*-l-e(y)*	INCH < ADJ [+COM]	(MacLeod 1987: fig. 15)
CHL	*-m-al*	INCH < PTCP [+INC]	(MacLeod 1987: fig. 15)
CHL	*-b'-ʌl*	INCH < PTCP [+INC]	(MacLeod 1987: fig. 15)
CHL	*-m-ʌ*	INCH < PTCP [+COM]	(MacLeod 1987: fig. 15)
CHL	*-(m)ʌ*	VERB < NOUN [+PST]	(Attinasi 1973: 217)
CHL	*-b'-ʌ*	INCH < PTCP [+COM]	(MacLeod 1987: fig. 15)
CHL	*-i*	INCH < NOUN	(Vázquez Alvarez 2002: 115)

Table 16: Ch'olan forms for the inchoative derivational suffix.

In Yukatekan, two different patterns can be discerned (Table 17). All languages mark the incompletive the same way with *–tal* (~ LAK *–tar*). In the completive, all also feature *–aj* (which is less productive in modern YUK), while only YUK and MOP additionally have *–l-aj.* For ITZ, *–ah* is described as a distal marker (Hofling 1991).

Most interestingly, YUK (modern and Colonial) and MOP mark intransitive positionals and the inchoative the same way, i.e. *–tal* [+INC] and *–l-aj-(i)* [+COM] (Danzinger 1996: 401-403). Following earlier suggestions based on historical linguistics, her study contributes further to the understanding of shared features between both derivations. The MOP stative positional may function in an intransitive sense and may be translated the same as the inchoative: "The syntactic agent is X-ing". But while the stative accentuates a state of being, "… is in an X-ing position", the intransitive positional rather refers to "… being in the act of X-ing."

Additionally, ITZ, LAK and YUK have *–ch-* (with aspect markers to follow), YUK also has *–t-* and *–p-*, from which *–p-* (~ *–b-*) and *–ch-* are also found in Ch'olan. For pYu, we can therefore reconstruct * *–(l)-aj* for the completive and *–tal* for the incompletive, as well as *–*C-* forms. The subjunctive in all languages except YUK is *–ak* (which has *–l-ak*), which may derive from **–a(h)-ik.*

Idiom	Attestations		Sources
ITZ	*-tal*	VERB < NOUN	(Schumann Gálvez 1971: 43)
ITZ	*-tal*	VERS [+INC]	(Itza' 2001: 103)
ITZ	*-tal*	INCH [+INC]	(Bricker 1986: tab. 13)
ITZ	*-tal*	INCH [+INC]	(MacLeod 1987: fig. 38)
ITZ	*-tal*	INCH [+INC]	(Hofling 1991: 29)
ITZ	*-tal*	INCH [+INC]	(Hofling and Tesucún 2000: 59)
ITZ	*-ah-al*	INCH [+INC]	(MacLeod 1987: fig. 38)
ITZ	*-ah-i(h)*	INCH [+COM]	(Bricker 1986: tab. 13)
ITZ	*-ah-(i)*	INCH [+COM]	(MacLeod 1987: fig. 38)
ITZ	*-aj*	INCH [+COM]	(Hofling and Tesucún 2000: 59)
ITZ	*-ah*	INCH [+COM]	(Hofling 1991: 29)
ITZ	*-č-ah*	INCH [+COM]	(MacLeod 1987: fig. 38)
ITZ	*-ak*	INCH [+SBJV]	(Bricker 1986: tab. 13)
ITZ	*-ak*	INCH [+DEP]	(Hofling and Tesucún 2000: 59)
ITZ	*-a'an*	INCH.PTCP	(Bricker 1986: tab. 13)
MOP	*-tal*	INTRS < NOUN,ADJ [+INC]	(Schumann Gálvez 1997: 113, 114-115)
MOP	*-tal*	INCH [+INC]	(Bricker 1986: tab. 13)
MOP	*-tal*	INCH [+INC]	(MacLeod 1987: fig. 38)
MOP	*-tal*	INTRS [+INC]	(Mopan 2001: 207)

MOP	*-tal*	INTRS [+INC]	(Ulrich and Ulrich 1966: 262)
MOP	*-tal*	INCH [+INCH]	(Hofling 2011: 16)
MOP	*-l-aj-(i)*	INTRS < NOUN,ADJ [+COM]	(Schumann Gálvez 1997: 120)
MOP	*-aj-i*	INCH [+COM]	(Bricker 1986: tab. 13)
MOP	*-ah-(i)*	INCH [+COM]	(MacLeod 1987: fig. 38)
MOP	*-aj-i*	INTRS [+COM]	(Mopan 2001: 207)
MOP	*-aj-i*	INTRS [+COM]	(Ulrich and Ulrich 1966: 263)
MOP	*-aj-i*	INCH [+COM]	(Hofling 2011: 16)
MOP	*-ac*	INCH [+SBJV]	(Bricker 1986: tab. 13)
MOP	*-ak*	INCH [+DEP]	(Hofling 2011: 16)
MOP	*-a'an*	INCH.PTCP	(Bricker 1986: tab. 13)
MOP	*-n-Vl*	INCH (unproductive)	(MacLeod 1987: fig. 38)
MOP	*-n-i*	INCH (unproductive)	(MacLeod 1987: fig. 38)
LAK	*-tal*	INCH [+INC] (temporary)	(Bricker 1986: tab. 13)
LAK	*-tal*	STAT marker	(Bruce 1968: 73)[210]
LAK	*-tar*	INCH [+INC]	(MacLeod 1987: fig. 28)
LAK	*-tah*	INCH [+INC]	(Kováč 2012: 1)[211]
LAK	*-č-əl*	INCH [+INC] (permanent)	(Bricker 1986: tab. 13)
LAK	*-čəl*	STAT marker	(Bruce 1968: 73)
LAK	*-č(-ʌh)-ʌr*	INCH [+INC]	(MacLeod 1987: fig. 28)
LAK	*-h-ih*	INCH [+COM]	(Bricker 1986: tab. 13)
LAK	*-h-(i)*	INCH [+COM]	(MacLeod 1987: fig. 28)
LAK	*-chah*	INCH [+COM]	(Kováč 2012: 1)
LAK	*-č-əh-ih*	INCH [+COM]	(Bricker 1986: tab. 13)
LAK	*-č-ʌh-(i)*	INCH [+COM]	(MacLeod 1987: fig. 28)
LAK	*-aʔan*	INCH.PTCP	(Bricker 1986: tab. 13)
YUK	*-x-al*	INCH < NOUN,ADJ	(McQuown 1967: 231)
YUK	*-h-al*	INCH [+INC]	(Smailus 1989: 30)
YUK	*-hal ~ -hil*	INCH [+INC]	(Beltrán 1859: § 90)
YUK	*-hal*	INCH [+INC]	(Tozzer 1921: 90)
YUK	*-h-al ~ -h-il*	INCH [+INC]	(MacLeod 1987: fig. 46)
YUK	*-{t,p,ch}-ah-al*	INCH [+INC]	(Smailus 1989: 26)
YUK	*-t-al*	INCH [+INC]	(Smailus 1989: 32)
YUK	*-t-al*	INCH < NOUN,ADJ	(McQuown 1967: 234)
YUK	*-tal*	INCH [+INC]	(Tozzer 1921: 90)
YUK	*-t-(ah)-al*	INCH [+INC]	(MacLeod 1987: fig. 47)
YUK	*-tal*	INCH [+INC] (temporary)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 348-349)
YUK	*-tal*	INCH [+INC]	(MacLeod 1987: fig. 28)
YUK	*-tš-al*	INCH [+INC]	(Tozzer 1921: 90-91)
YUK	*-č-ah-al*	INCH [+INC]	(MacLeod 1987: fig. 46)
YUK	*-č-ah-al*	INCH [+INC] (permanent)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 348-349)
YUK	*-č-ah-al*	INCH [+INC]	(MacLeod 1987: fig. 28)
YUK	*-(a)h-al*	INCH [+INC] (rare)	(Bricker 1986: 30, tab. 13)[212]
YUK	*-h-i*	INCH [+COM]	(Smailus 1989: 30)
YUK	*-hi*	INCH [+COM]	(Beltrán 1859: § 90)
YUK	*-h-i*	INCH [+COM]	(MacLeod 1987: fig. 46)
YUK	*-h-(i)*	INCH [+COM]	(MacLeod 1987: fig. 28)

[210] The inchoative derivation, despite the misleading description, is ensured by examples like *sis-tal*, "enfriarse" < *siis* "frío" or *ka-tal*, "emborracharse" < *kal–* "frío". The same is true for *–čəl*, already described as semantically close to *–tal* by Bruce, e.g. *sək-čəl-en*, "se aclara" < *sək*, "blanco".

[211] The suffix *–tah* seems to be an allomorph to *–tal* ~ *–tar*. Compare to the *kusasi'tah ka'an*, "aclaro el cielo". The completive counterpart was provided as *sasi'chah ka'ana*, "aclaró el cielo", with *sas*, "blanco" and *saasil*, "claridad" (Bruce 1968: 116). The inchoative was obviously made from the derived noun, as we find *sasi'* (assuming [l] > [ʔ], compare to *kal–* in footnote 210) in the examples. The examples furthermore exhibit the different semantics pointed out by Bricker (1986: tab. 13): the incompletive sentence describes the temporary state / process of the sky becoming clear, while the completive describes the permanent state of a cleared sky.

[212] Bricker (1986: 29-30) attests that *–(a)h* only sometimes derives inchoatives from nominal and adjectival roots and has become rare to do so in modern YUK, where *–tal* and *–ch-ah-al* are used, with their semantic distinction only among adjectival roots and only in the incompletive aspect. Indeed, an accidental, temporary change would not be plausible in the completive aspect anymore.

YUK	*-(a)h-ih*	INCH [+COM] (rare)	(Bricker 1986: 30, tab. 13)
YUK	*-l-(a)h-i*	INCH [+COM]	(Smailus 1989: 32)
YUK	*-l-ah*	INCH [+COM]	(Tozzer 1921: 90)
YUK	*-{t,p,ch}-ah-i*	INCH [+COM]	(Smailus 1989: 26)
YUK	*-tš-ah*	INCH [+COM]	(Tozzer 1921: 90-91)
YUK	*-č-ah-(i)*	INCH [+COM]	(MacLeod 1987: fig. 46)
YUK	*-č-ah(-ih)*	INCH [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 348-349)
YUK	*-Ø-ac*	INCH [+SBJV]	(Smailus 1989: 30)
YUK	*-ac*	INCH [+SBJV]	(Beltrán 1859: § 90)
YUK	*-l-ac*	INCH [+SBJV]	(Smailus 1989: 32)
YUK	*-tal-e*	INCH [+FUT]	(Tozzer 1921: 90)
YUK	*-{t,p,ch}-ah-ac*	INCH [+SBJV]	(Smailus 1989: 26)
YUK	*-tš-al-e*	INCH [+FUT]	(Tozzer 1921: 90-91)
YUK	*-č(-ah)-ak*	INCH [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 348-349)
YUK	*-č-ah-ak*	INCH [+SBJV]	(MacLeod 1987: fig. 28)
YUK	*-č-ah-áʔan*	INCH.PTCP	(Bricker 1986: tab. 13)

Table 17: Yukatekan forms for the inchoative derivational suffix.

The prevalent forms in Tzeltalan (Table 18) are *–ub*, *–ib* (also reconstructed for pTz) and TZO only *–ob*. Kaufman (1994, A4b: 48, 50) related it to his Versive 1 from the pM **–(o)b'* passive. As the majority of Greater Q'anjobalan languages also feature *–b* (see below), we can at least trace it back to pWM. Also in connection with the discussion above for the Ch'olan subgroup, the connection of the inchoative to the passive is because of shared semantics: something is being the patient while becoming the quality of the base adjective/noun.

Another form is pTz **–Vy*, a form also used for intransitive positional marking (see Chapter 3.1.1.2). Surely cognate to Ch'olan (and possibly Yukatekan) is the **–Vj* intransitiviser of nominal roots and stems. While the vowel varies between TZE and TZO, only the *–aj* allomorph is constant, showing a close relationship to ClM as well.

Idiom	**Attestations**		**Sources**
pTz	**-Vy*	INTRS	(Kaufman 1972: 142)
pTz	**-Vx*	INTRS	(Kaufman 1972: 142)
pTz	**-ub', -ib'*	INTRS < NOUN,ADJ	(Kaufman 1972: 142)
TZE	*-{a,e,u}h*	INTRS < VER.TR,NOUN,ATTR	(Slocum 1948: 83)[213]
TZE	*-{i,a,e}h*	INTRS < NOUN,ADJ	(Kaufman 1971: 55-56, 57)
TZE	*-ub*	INTRS < NOUN,ADJ	(Kaufman 1971: 59-60)
TZE	*-ub'*	VERS < NOUN,ADJ	(Kaufman 1994, A 4b: 50)
TZE	*-ub*	INCH < NOUN,ATTR,VER	(Slocum 1948: 84)
TZE	*-Vy*	INTRS < ADJ	(Kaufman 1971: 59)
TZE	*-Vy*	VERS < NOUN,ADJ	(Kaufman 1994, A 4b: 50)
TZO	*-aj ~ -ij*	INCH < ADJ	(Haviland 1981: 239)
TZO	*-Vj*	VER.INTR (related to noun)	(Haviland 1988: 85)
TZO	*-{a,i,o}j*	INTRS < NOUN,ADJ	(García de León 1971: 24)
TZO	*-Vx*	INTRS	(Cowan 1969: 98-99)
TZO	*-Ub*	INTRS (developmental)	(Cowan 1969: 99)[214]

[213] There are four functions attributed to this suffix. The first is the proper inchoative, e.g. *wiʔnah*, "be hungry" < *wiʔn*, "hunger". The second seems to be related to the status marking of certain derived intransitives, e.g. *ʔak'tah*, "[to] dance" < *ʔak'ot*, "dance" (see footnote 15) for the ClM parallel. Eventually, such cases may also be understood as inchoatives in a certain way, i.e. "be dancing, become dancing". The third morphosyntactic environment is with the <*h*>…*-ah* intransitivising of positional roots (see Chapter 3.1.1.2). Finally, we can identify the thematic suffix of (celeritive) intransitivised positionals (see Table 13).

TZO	*-ib/-ub*	INCH	(Haviland 1988: 85)
TZO	*-ob'*	VERS < NOUN,ADJ	(Kaufman 1994, A 4b: 50)
TZO	*-ub ~ -ib /CuC*	INCH < ADJ	(Haviland 1981: 238)
TZO	*-ub*	INCH < NOUN,ADJ	(García de León 1971: 25)
TZO	*-ib / CuC*	INCH < ADJ	(Haviland 1981: 238)

Table 18: Tzeltalan forms for the inchoative derivational suffix.

Three different, yet consistent patterns of inchoative derivation occur in Greater Q'anjobalan (Table 19), prevalent is *–b(i)*, which again relates to the pM **–b* passive (occurring in all languages except MCH) and is cognate to Tzeltalan. In CHJ, the same suffix is also used for the intransitive positional as an alternant to *–lji*.

We also find *–(V)x(i)* forms in all languages, and *–(V)j* forms in CHJ and QAN. Both show similarities to the passive derivation (Table 9). The latter might also be cognate to pTz **–Vj*. The QAN *–loj* also shows relationship to QAN and POP passivation.

Idiom	Attestations		Sources
CHJ	*-p'-(ih)*	INCH,ADJ < POS,NOUN	(Hopkins 1967a: 74, 87)[215]
CHJ	*-b'*	VERS < NOUN,ADJ	(Kaufman 1994, A 4b: 50)
CHJ	*-b'i*	INCH < ADJ	(Domingo Pascual 2007: 188-189)
CHJ	*-b'i*	INCH < ADJ	(García Pablo and Domingo Pascual 2007: 140)
CHJ	*-b'i*	VER < NOUN	(Williams and Williams 1966: 231)
CHJ	*-b'i /_# ~ -b' /...*	VER < NOUN	(Buenrostro Díaz 2009: 71, 73, 76, 180-181)
CHJ	*-ej*	VER < NOUN	(Williams and Williams 1966: 231)
CHJ	*-aš*	VER.INTR < NOUN	(Hopkins 1967a: 89)[216]
CHJ	*-xi*	INCH < ADJ	(García Pablo and Domingo Pascual 2007: 140)
CHJ	*-CVC*	colour changes	(Hopkins 1967a: 90-91)[217]
TOJ	*-p'*	INCH < NOUN,ATTR	(Supple and Douglass 1949: 171-172)
TOJ	*-b'*	VERS < NOUN,ADJ	(Kaufman 1994, A 4b: 50)
TOJ	*-b'*	INCH < NOUN,VER.TR,POS	(Furbee-Losee 1976: 67)
TOJ	*-B'*	INCH	(Furbee-Losee 1981, II: 92)
TOJ	*-$\check{s}_1$*	INCH	(Furbee-Losee 1976: 68)
TOJ	*-X1*	INCH	(Furbee-Losee 1981, II: 86)
TOJ	*-c'*	INCH < NOUN	(Furbee-Losee 1976: 68)
QAN	*-b'*	VERS < ADJ	(Q'anjob'al 2005: 106)
QAN	*-b'*	VERS < ADJ,NOUN	(Francisco Pascual 2007: 37-38)
QAN	*-b'i*	VERS < ADJ	(de Diego Antonio et al. 2001: 24)
QAN	*-b'-i*	INCH < ADJ,NOUN	(Martin 1977: 162-163)
QAN	*-an-b-i*	INCH < POS	(Martin 1977: 239-241)
QAN	*-x*	VERS < ADJ	(Q'anjob'al 2005: 106)
QAN	*-j*	VERS < ADJ,NOUN	(Q'anjob'al 2005: 107)[218]

[214] Based on the given examples, the following morphophonemic rules are deducible: *-Vb* > *-ub* / C{e,i}C, *-Vb* > *-ib* /C{a,u}C and *-Vb* > *-ob* /CoC.

[215] The suffix *–p'* only derives an intermediate lexical class, an additional suffix following constitutes the final class and meaning, e.g. *šáč-p'-al*, "crotch" from the positional root *šáč*, "forked". Examples for an overt inchoative function are *pák-p'-(ih)*, "to become flexible" from positional root *pák*, "flexible or folded" and *yáʔš-p'-(ih)*, "to turn green" from the adjective *yáʔš*, "green".

[216] This is the same suffix used after *–n* to form the passive voice (see Table 9). Examples for the inchoative use are *sók'om-aš-(ih)*, "to become muddy" from *sók'om*, "mud" and *čáʔp'-aš-(ih)*, "to become two" from *čáʔp'*, "two".

[217] There are several *–CVC* shape suffixes to derive an intransitive verb out of a colour adjective: *–púl*, *–cém*, *–cúx*, *–čék*, *–t'úp'*, *–xáč*, *–xár*, *–múc*, *–léw*, *–lék'*, and *–lóx*. Some seem to distinguish intensity or refer to inanimate/animate categories, e.g. *k'ík'-cúx-(ih)*, "to become somewhat dark (may not refer to people)" and *k'ík'-t'úp'-(ih)*, "to darken (as the sky darkens before a storm)". These functionally and morphologically restricted derivation suffixes have not yet been tested against their semantics.

QAN	*-j*	INTRS < ADJ,NOUN (rare)	(Francisco Pascual 2007: 41)
QAN	*-loj*	VERS < ADJ	(Q'anjob'al 2005: 107)
QAN	*-ay*	VERS < ADJ	(Q'anjob'al 2005: 107)
QAN	*-y*	VERS < NOUN	(Francisco Pascual 2007: 55)[219]
AKA	*-b'*	INCH	(Zavala Maldonado 1992b: 36-37, 54)
AKA	*-b'i /_{C,#}*	INCH	(Zavala Maldonado 1992a: 195, 200)
AKA	*-b' /_V*	INCH	(Zavala Maldonado 1992a: 199)
AKA	*-an-b'*	INCH < POS	(Zavala Maldonado 1992b: 37, 53)
AKA	*-b'itoj ~ -b'i'eloj*	VERS < ADJ	(Akateka 2007: 204)[220]
AKA	*-b'itoj*	VERS < ADJ	(Méndez Martinez 2004: 138)
AKA	*-š̥i*	INCH	(Zavala Maldonado 1992a: 182, 216)[221]
POP	*-b'*	INCEPT < ADJ,NOUN	(Day 1973: 43)
POP	*-b'*	VERS < ADJ,NOUN	(Delgado Rojas et al. 2007: 80, 103)
POP	*-b'*	VERS < ADJ,NOUN	(Ross Montejo and Delgado Rojas 2007: 47-48)
POP	*-b'-i, -b'-{o,u}j*	VER.INTR < ADJ,NOUN	(Popti' 2001: 115-116, 132)
MCH	*-(e:)x*	INCH	(Palosaari 2011: tab. 5.5)

Table 19: Greater Q'anjobalan forms for the inchoative derivational suffix.

Considering that the ClM inscriptions were mostly written in the completive aspect, Ch'olan shows the best correspondence to the ClM pattern by having the completive marked in *–a* < *–aj*. Only the preceding consonant frequently known from all Ch'olan languages is missing in ClM, and which would mostly be *–l*. But as at least the CHR data demonstrate, the *–C-aj* pattern was not necessary in all cases. However, we have some more or less reasonable evidence for WCh vernacular inchoatives in *–n-i*[222] and *-m-aj*[223] (Gronemeyer 2011a: fn. 16). The existence of ClM ~ *–ij*, as proposed by Lacadena

[218] For a nominal basis compare to *yas-j-i*, "me lastimé" < *yas*, "herida".

[219] This suffix is described to be non-productive occurring with only very few examples. It shows similarities to the general GQa intransitive positional derivation.

[220] Both suffix are composite and can be analysed as *–b'i-toj* and *–b'i'-eloj* as 'VERS-DIR'. We have *–toj* and *–eloj* as deictic enclitics (Akateka 2007: 160, Méndez Martinez 2004: 86-87, 184-185). The use of directionals with the inchoative is thus similar to the intransitive positional (see footnote 197). Other directionals are possible with inchoative forms, e.g. *š̥-Ø-yaʔ-b'i-ʔey nax in-k'a:l-an*, 'COM-3SG.ABS-doloroso-INCH-DIR CLF 1SG.ERG-hijo-ENCL' as "[m]i hijo se enfermó" (Zavala Maldonado 1992a: 195). The morphological and semantic relationship between the intransitive positional and inchoative suffixes in many Mayan idioms has already been pointed out several times. From a semantic perspective, it is even more intriguing to find directional enclitics with the inchoative as a verb form describing a becoming into a state. An analysis of the correspondence between directional and adjectival base and verbal derivation might be highly revealing for semantics, especially when the inchoative may be used with different enclitics (e.g. for telicity).

[221] Zavala Maldonado (1992b: 37) further explicates that the suffix is an iterative intransitiviser, e.g. *xen-š̥-i*, "ondear –como la bandera–" < *xen#*, "con dos dimensiones".

[222] The *–n-i* [+COM] would specifically fit a CHN pattern. We have multiple occurrences especially in Palenque, e.g. **AJAW=ni** < *ajaw-n-i-Ø* (PAL TI-W, F12) and **AJAW=ni=ya** < *ajaw-n-i-Ø-[ji]y* (PAL TI-C, H4). Such inchoatives have already been taken as *–Vn* inchoatives (cf. Stuart 2005c: 72), but rather by syntactic considerations and they have not been tied to a specific branch. Problematic are the occurrences of [a]**AJAW=ni** (NAR St. 22, E10), [a]**AJAW=ni=ya** (NAR Alt. 1, B8) and **AJAW=ni** (C Dr. 25b) that definitely are outside a WCh context. In ECh, only CHT seems to have a derivation with *–m-a* ~ *–m-i* (as the closest allomorph) in the completive, but *–n* is absent, as it is in CHL. Eventually, we can infer that a **–(V)n* suffix was existent in Ch'olan, as we also find pTz **–V_1n* ~ **–in* as an intransitiviser of nominal bases and transitive and positional roots (Kaufman 1972: 142). But we also know that WCh features percolated into an ECh context (see Chapter 1.2.2.3). It is also to question whether a **wa** phonemic complement (e.g. PAL TI-W, H2) is to provide a suffix vowel or not (as a synharmonic spelling at a morphemic boundary might also indicate C.C, see footnote 37).

[223] On TRT Mon. 8, A5, we have **HEADLESS.BODY=ma=ja**, which was proposed to be an inchoative by Barbara MacLeod (written communication, October 7, 2011). The reading of the HEADLESS.BODY sign was proposed by Yuriy Polyukhovych (written communication, October 11, 2011) as **LUB**, "falling, tired, bent down". That the root is also adjectival or nominal (thus serving as a basis for the inchoative) is assured by the use within the nominal phrase of **IX-HEADLESS.BODY-AJAW** (e.g. PAL PT, F8).

(2003: 852-854), has not systematically been investigated and must remain a possible reconstruction so far. However, it is a possibility as a reflex of the pGT *–*ij* intransitiviser (see footnote 128).

As we observe the same processes of elimination of the final spirant in Ch'olan as with the passive thematic, we can also undoubtedly assume a synharmonic **Ca=ja** / __# < –*aj* spelling[224], where the consonant spells the root coda. Alternatively, **Ca=ja** / __# < –*C-aj* provides the consonants of the proper derivational suffix after following the root spelling. Likely, for the Late Classic, we may also postulate **Ca** / __# spellings to reflect the phonological development as observed in CHR and CHL. Morphophonemic alterations have not been described grammatically, but syncopation to –*j* / __(')V may be assumed.

Not all of the following examples have yet been identified in the script, but late spellings may feature other phonological shifts due to vernacular influences. With the CHN and CHL completive –*i* (see footnote 224), **Ci=ja** / __# spellings (retaining =**ja** as a visual marker) can be expected and are indeed found (Lacadena 2003: 852-854). To what extent these are indeed vernaculars is subject to the analyses. For CHR vernaculars, there might be **la-na** < –*lan* ~ –*ran* to be expected, as well as **la=wa** < –*law* for CHT (or ECh in general).

Yukatekan and Tzeltalan as vernaculars also contribute to the question of the vocalisation and spelling of the inchoative suffix, taking the pYu *–*(l)-aj* and pTz *–*Vj* into account, although the latter may feature variable **CV=ja** / __# spellings, although a harmonisation with the prevalent ClM –*aj* seems likely. For the Tzeltalan –*Vb* (V = /i, u/), we can furthermore assume **CV=bV** / __# spellings, while the vowel of the **bV** sign must remain undetermined[225].

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-aj*	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√-[a]j	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	* *√-C$_d$-aj*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**	1.f.ii
	C$_d$={l,m,t}	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**	1.f.i
Eastern Ch'olan	* *√-C$_d$-aj*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**	1.f.ii
	C$_d$={m,t}	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**	1.f.i
	* *√-l-aw*	**CV$_1$-CV$_1$=la=wa / CV$_1$C(-CV$_1$)=la=wa**	1.f.ii
	* *√-l-an*	**CV$_1$-CV$_1$=la=na / CV$_1$C(-CV$_1$)=la=na**	1.f.ii
Western Ch'olan	* *√-i(j)*	**CV$_1$-Ci(=ja) / CV$_1$C-Ci(=ja)**	1.a,b,c,d.i (1.g.i)
	* *√-[i]j*	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	* *√-ni*	**CV$_1$-CV$_1$=ni / CV$_1$C(-CV$_1$)=ni**	-
	(*)√-C$_d$-aj	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**	1.f.ii
	C$_d$={',l,m,b,p,t}	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**	1.f.i

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[224] Lacadena (2009: fn. 6) considered the spelling **wi-tz-ja** (CML Urn 26 Spine 6, A3-A4) as a passive *witz-ij*. This is unreasonable, considering that the passive thematic is always –*aj* (Chapter 3.1.1.1). Furthermore, *witz* is a noun and cannot directly derive a passive, unless it is verbalised first to an intermediate **witz-a* with the factive suffix (see footnote 83) elided to render *witz-n-aj*. The only possibility is an inchoative, but likely less in a scheme 1.a.ii transcription *witz-ij* (unless considering a WCh vernacular), but a 2.a.i spelling for *witz-[a]j*.

[225] We may assume harmonic **bi** and **bu** spellings, both signs being possible in block final position. A conventionalised, fixed **bV** spelling seems unlikely considering the vernacular nature of this form.

Yukatekan	* *√-tal*	**CV$_1$-CV$_1$=ta-la / CV$_1$C(-CV$_1$)=ta-la**	-
	* *√-l-aj*	**CV$_1$-CV$_1$=la-ja / CV$_1$C(-CV$_1$)=la-ja**	1.f.i
	* *√-C_d-aj*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**	1.f.ii
	C_d={ch,p,t}	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**	1.f.i
Tzeltalan	* *√-V_Sb V_S={i,u}*	**CV$_1$-CV$_S$=bV / CV$_1$C-CV$_S$=bV**	1.a,b,c,d.i
	* *√-[V_S]b*	**CV$_1$-CV$_1$=bV / CV$_1$C(-CV$_1$)=bV**	2.a,b,c,d.i (2.e.i)
	* *√-V_Sj V_S={a,i}*	**CV$_1$-CV$_S$=ja / CV$_1$C-CV$_S$=ja**	1.a,b,c,d.i
	* *√-[V_S]j*	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	* *√-Vy*	**CV$_1$-CV$_1$=yV$_1$ / CV$_1$C-CV$_1$=yV$_1$**	1.a.,ci
		CV$_1$-CV$_1$=yV$_2$ / CV$_1$C(-CV$_1$)=yV$_2$	1.a,c.ii

Table 20: Representative, linguistically induced spelling patterns on junctures to be expected for the inchoative derivational suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.1.4 – Absolutive Noun Marker *–aj*

Ch'olan knows two different types of absolutive noun marking (Table 21). The first follows a *–Vl* pattern, prevalently *–al* ~ *–ar* ~ *–ɑl* and *–il* (and *–el* in CHL). These are known from CHR and CHL, and may be assumed for CHT as well, although it has not been described. CHN does not know any absolutive suffix at all (Knowles 1984: 196-197).

In CHL (Warkentin and Scott 1980: 15), these suffixed are attached to unpossessed body parts, clothing, plant parts, building parts and kinship terms. Similar semantic domains can be considered for the other Ch'olan languages, considering Zender's (2004b) identification of the absolutive in ClM for at least body parts, clothing and kinship terms (although each with different suffixes)[226].

The second pattern is *–bil* ~ *–bir* ~ and *–tzir* restricted to ECh. It is reserved for kinship terms and CHR *–tzir* may relate to the YUK *–tzil* honorific / absolutive suffix (see below). CHR however seems to restrict the use of the absolutive suffix to certain kinship terms only.

Based on the evidence, we could reconstruct pCh **–al* and **–il* as the generic absolutive suffixes, although *–aj* was the form used in ClM. Equally possible is a later innovation that may find confirmation and dating by epigraphic evidence. At least for ECh, **–bil* and **–tzil* can be reconstructed, if they were not already present in pCh, but became out of use in WCh[227].

Idiom	Attestations	Sources
pCh	n/a	
ECh	n/a	

[226] Buildings or building parts are attested in ClM as well. Although *nah*, "house" is a subletive noun (with Ch *–otot* ~ Yu *–otoch* as the possessed form) that does not require an absolutive suffix, we have one instances with the *–aj* suffix known for items of personal property: **NAH^{hi}=ja** < *nah-[a]j* on TRT Mon. 6, J6 (Gronemeyer 2006b: 152). As this is connected to a house-burning event (Stuart 1998) and refers to the sanctuary that once housed TRT Mon. 6, it might also have been considered as the personal belonging to ruler *Bahlam Ajaw*.

[227] There is potentially another absolutive kinship suffix *–taj* only attested in ClM (Christian Prager, written communication, May 13, 2012). It exclusively occurs with the *sukun* ~ *sakun* and *i[h]tz'in* brother expressions and is for example found in the recently discovered Xultun murals (Saturno et al. 2012), written as **i-tz'i-ni=ta-ji** and **sa-ku-nu=ta-ji**. David Stuart (Barbara MacLeod, written communication, June 3, 2012) considers **ta-ji** not to be a suffix, but translates as "obsidian". The idea of *–taj* was first put forward by several fellow epigraphers in Bonn at about 2009, but without necessarily considering it as an absolutive suffix. Its usage and meaning still needs debate.

CHT	*-b'il*	ABSL (kinship)	(Sattler 2004: 389)
CHT	*-bil*	ABSL (kinship)	(Robertson, Law and Haertel 2010: 199)
CHR	*-ar*	NOUN < NOUN	(Wichmann 1999: 111-114)[228]
CHR	*-b'ir*	ABSL (kinship)	(Wichmann 1999: 129-130)
CHR	*-b'ir, -tzir*	ABSL (kinship)	(Ch'orti' 2004: 109)[229]
CHN	*-Ø*	ABSL	(Knowles 1984: 196-197)[230]
CHL	*-ʌl*	ABSL	(Attinasi 1973: 300)
CHL	*-ʌl ~ -il*	ABSL	(Warkentin and Scott 1980: 15)
CHL	*-ʌl, il*	ABSL	(Beekman and Beekman 1953: 35, 36, 51, 56)[231]
CHL	*-el*	ABSL	(Attinasi 1973: 153)[232]

Table 21: Ch'olan forms for the absolutive noun marker.

Yukatekan mostly lacks an absolutive suffix (Table 22). In ITZ, simple nouns, kinship terms and body parts are almost always, but not obligatory possessed. Otherwise, with one exception, no special marking is used for unpossessed nouns (Hofling and Tesucún 2000: 90-91). MOP seems to have a –Ø absolutive suffix for those semantic categories that usually carry an absolutive suffix in other languages, but the evidence is scant (cf. Mopan 2001: 102-104, Schumann Gálvez 1997: 96) with few exceptions.

With *–tzil*, YUK and MOP features a cognate to CHR *–tzir* for unpossessed kinship terms[233]. It is also certainly tied to the 'honorific' suffix (see footnote 69)[234], which may place the revered addressee in

[228] Wichmann (1999: 111) states that "[t]he fact that a suffix of the same shape and similar semantics also occurs on nouns, strongly suggests that *–ar* is more than a nominaliser." He further explicates that "[s]ome of the underived forms may actually not exist as free forms" and "[a] lot of the derived ones are only attested as possessed." This is indication to consider *–ar* as an absolutive suffix, despite the fact that also nouns that never get possessed (Ch'orti' 2004: 109-110) carry that suffix, e.g. *ak'ab ~ ak'bar*, "night". Some of the examples however show differences in meaning, as *ik'*, "air" vs. *ik'ar*, "wind" or *ja'*, "water" vs. *ja'jar*, "rain, rot". This rather points to an abstractive or collective function (cf. Gronemeyer 2006b: 28, Stuart 1998: fn. 3). See Lacadena (2004a: 88-93) on the abstractive *ha'al*, "rain" in hieroglyphic texts. The *–ar* suffix in CHR therefore has three distinct functions, although evidence for the absolutive function is rather weak.

[229] Hull provides a second variant with *–tzir*. It is not clear whether differences in the semantics are involved. All examples with *–bir* are either first-order or consanguine kinship terms, while Hull (2005: 6, 89) provides *–tzir* only with terms for affinity: *arib'tzir*, "daughter-in-law" and *nya'rtzir*, "son-in-law".

[230] The majority of nouns are optionally possessed, if there is no difference between their part relation possessed form and their absolute form, both take *–Ø*, regardless of their semantic domain.

[231] Refer to the examples *askunil*, "hermano mayor" vs. *i yʌskun*, "su hermano", *bujkʌl*, "camisa" vs. *i bujk*, "su camisa", *majtanil*, "regalo" vs. *i majtan*, "su regalo", *pixolʌl*, "sombrero" vs. *i pixol*, "su sombrero", but also *√ok* vs. *ok-ʌl*, "foot" (Attinasi 1973: 300).

[232] Among the undifferentiated *–el* "nominaliser" suffixes (see footnotes 251 and 454) is *√čol/*, "milpa" vs. *čolel*, "milpaland". A contracted ***čol-lel* abstractive seems obvious in the first instance, but in fact this *–el* can be considered as an allomorph to the *–Vl* absolutive by *i chol*, "su milpa" (Aulie and de Aulie 1978: 29). When comparing to the above categories of nouns that may take the absolutive pronoun, it is surprising to find 'milpa' among them, unless a lot of cultivable land is considered as an item of personal property.

[233] Also consider the *–ätz* suffix that occurs in KAQ (García Matzar and Obispo Rodríguez Guaján 1997: 106) as a suffix of unpossessed kinship terms. A segmentation of the YUK, MOP and CHR suffix into *–tz-il ~ –tz-ir* can therefore be made, and Houston, Robertson and Stuart (2001b: 45) quite rightly infer a pM **–(V)tz* kinship marker.

[234] ITZ also uses *–tzil ~ –intzil* as a 'honorific' marker (Hofling and Tesucún 2000: 115) that may thus also occur with possessed forms. The latter allomorph is only used when the relationship term does not already end on *Vn*, compare *u-tat-intzil-oo'*, "their father" vs. *uy-itz'in-tzil-oo'*, "their brother". These allomorphs further confirm the notable preference for kinship terms to end on *Vn*. Knowles (1984: 174) considers *–Vn* to derive kinship terms from unique constituents in CHN, an assumption I independently proposed for ClM. Knorozov (1955: 61) considered *ach ~ at*, "miembro viril" to be the basis for *y-atan*, "wife". In other modern languages, there is also clear evidence for suffixation, e.g. TZE *nichanil*, "hijo respectu viri" (Ara 1986: f. 76r) and TZO *ničim*, "flower […], Ritual speech, midwife referring to baby", derived from the base lexeme *nič*, "flower, strength […] An poss. restricted to Ritual speech" (Laughlin 1975: 252). However, it is difficult to provide an etymology for the proposed ClM kinship roots. Some kinship terms also seem to be optionally be expandable by the *–Vn* suffix, as

a general, non-possessible relationship system[235]. Otherwise, no specific absolutive suffixes are known from YUK, nor LAK[236].

Idiom	Attestations		Sources
ITZ	*-il*	[-POSS]	(Itza' 2001: 80)[237]
MOP	*-tzil, -ii'*	[-POSS]	(Mopan 2001: 105)[238]
LAK	n/a		
YUK	*-tzil*	ABSL (kinship)	(Smailus 1989: 114)

Table 22: Yukatekan forms for the absolutive noun marker.

For pTz, Kaufman (1972: 149) chiefly reconstructs **–il* and **–al* (among other *–Vl* allomorphs, but likely without ***–ul*) for body parts, clothing, instruments and all kinship terms. The applicability of the absolutive marker in Tzeltalan (Table 23) therefore concurs largely with ClM. The situation is more diverse in the descendant languages.

Examples provided for TZE (Radhakrishnan 1970: 394, 396) include body parts and relationship terms. Items of personal belonging, such as clothing are not necessarily counted to the group of nouns to bear the absolutive, compare *pišol*, "hat" with *hpišol*, "my hat" (Radhakrishnan 1970: 404). The examples for TZO given by Schuller (1925: 199) include body parts and relationship terms, Haviland (1981: 66-68)[239] adds clothing. However, not all kinship terms carry an absolutive suffix (Hopkins 1969).

Idiom	Attestations		Sources
pTz	**-Vl-$_1$*	[-POSS]	(Kaufman 1972: 149)
TZE	*-il*	[-POSS]	(Slocum 1948: 80-81)
TZE	*-il*	[-POSS]	(Kaufman 1971: 105-106)
TZE	*-Vl*	[-POSS]	(Radhakrishnan 1970: 394, 396)

Yuriy Polyukhovych (written communication, September 14, 2001) was able to demonstrate by the syllabic spelling of **ya=la=na** < *y-al-an*, "child of mother" on K2295, Z1.

235 Compare *yum*, "padre" with *yumtsil*, "díos" (Barrera Vásquez 1993: 982, 983). This observation may also be true for the ClM, as the case of *u-bak-tzil* on YAX Lnt. 10, F7 suggests. A captive (clearly 'honorific', as possessed by its captor) is placed into a social role paralleling a kinship position. This compares to the Aztec, where captives were treated and considered as sons by the captor (de Paula Loures de Oliviera 1999: 186). Bernadino de Sahagún (Anderson and Dibble 1950-82, II: 54) e.g. explicates in connection to the *Tlacaxipehualiztli* feast: <*Auh in male, amo uel qujquaia, yn jnacaio imal, qujtoaia, cujx çan no ne njnoquaz: ca yn iquac caci, qujtoa, ca iuhquj nopiltzin: Auh in malli, qujtoa ca notatzin: auh tel tepal qujquaia intemal*>. – "But the captor could not eat the flesh of his captive. He said, 'Shall I perchance eat my very self?' For when he took [the captive], he had said: 'He is as my beloved son.' And the captive had said: 'He is my beloved father.' But yet on someone else's account he might eat of one's captive."

236 This is confirmed by two possibilities to say "tengo dos camisas" as *ka'pe nok'* or *ka'pe in nok'* (lit. "dos [son] mis camisas").

237 There is only one example mentioned to follow this pattern: *et'okil* vs. *inwet'ok*, "mi compañero". It would be cognate to MOP and Ch'olan and Tzeltalan examples.

238 Only two examples are provided: *et'oktzil* vs. *inwet'ok*, "mi familia" and *kikii'* vs. *ukik*, "su tía, su hermana mayor", while Hofling (2011: 27) provides some "two dozen". The first instance recalls the kinship suffixes in YUK and CHR, the second cannot reliably connected to *–il* forms known from ITZ, Ch'olan and Tzeltalan.

239 In some cases, the absolutive suffixation changes the semantics of the noun (Haviland 1981: 68). While *bankil-al* usually refers to the elder brother, it also may refer to an official or important ancestor. Likewise, certain absolutive body parts may refer to diseases or pathological states, e.g. may *ʔe-al*, "mouth" also refer to an ulcus of the oral fissure/cavity.

TZE	*-Vl*	[-POSS]	(Hinmán Smith n.d.: 25-26)
TZO	*-Vl*	[-POSS]	(Haviland 1988: 86, 98-99)
TZO	*-{a,e,o}l*	[-POSS]	(Schuller 1925: 199)
TZO	*-Il*	[-POSS]	(Cowan 1969: 54-55, 104)
TZO	*-Vl*	[-POSS]	(Haviland 1981: 66-67, 142-143)[240]
TZO	*-Vl*	ABSL	(Laughlin 1975: 24)
TZO	*-{i,a,e}l*	independent status	(García de León 1971: 30)

Table 23: Tzeltalan forms for the absolutive noun marker.

Within the Greater Q'anjobalan branch (Table 24), two phonological patterns can be made out. Chujean has * *–al* as its absolutive suffix, although only constantly represented in TOJ, while in CHJ the data suggest a dialectal restriction. Q'anjobalan has *–e(j)*, while only MCH has a potential *–Vtz* suffix that may relate to Ch'olan and Yukatekan *–tzil*, although no semantic domain is given.

QAN allows body parts, certain items, persons/relatives and collectives to carry an absolutive suffix[241], AKA regularly only body parts and clothing[242]. An interesting case is *yaq chib'ej*, "carne con mal olor (descompuesta)" (de Diego Antonio et al. 2001: 35) which clearly has to relate to flesh detached from the body. Therefore, QAN also takes the *–ej* suffix for body parts which show the *–Ø* [+POSS] / *–is* [-POSS] pattern in ClM.

The Q'anjobalan evidence is of special importance for the ClM *–aj*, as we could reconstruct a pQa *–*ej* (which lost the final spirant except in QAN), which would be more in accordance with EM and also ClM (potentially with the same [a] > [e] shift, see footnote 173). For the pCT branch, I would assume (an innovated?) **–Vl* ~ **–al*, providing a variable vowel allomorph additionally to a main **–al*, because it also visible in pCh and pTz.

Idiom	Attestations		Sources
CHJ	*-Ø*	NOUN [±POSS]	(Domingo Pascual 2007: 110, 116-117)
CHJ	*-Ø*	NOUN [±POSS]	(García Pablo and Domingo Pascual 2007: 111)
CHJ	*-Ø*	NOUN [±POSS]	(Buenrostro Díaz 2009: 48, 49, 50)
CHJ	*-al ~ -il*	NOUN [±POSS]	(Buenrostro Díaz 2009: 52, 105, 108, 111-113, 121)[243]

[240] Haviland reports a prevalence for *–il*, but the vocalisation seems to be conditioned by the root vowel or the last vowel in case of disyllabic words. The following rules (not exhaustive) may apply: *-Vl* > *-il* / C{a, i}C, *-Vl* > *-al* / C{a, e}C, CVCiC, *-Vl* > *-ul* / CuC, *-Vl* > *-ol* / CoC.

[241] For example *q'ab'ej*, "mano" vs. *koq'ab'*, "nuestra mano"; *txikinej*, "oreja" vs. *hatxikin*, "tu oreja"; *etb'ihej*, "acompañante" vs. *jetb'i*, "nuestro acompañante"; *tx'otx'ej*, "tierra" vs. *stx'otx' heb'*, "su tierra (de ellos)". The latter example is interesting, as it makes 'earth' possessible in the sense of a 'plot of land, property'. Compare to CHL *čolel*, "milpa" (footnote 232). Compound nouns are also concerned, e.g. *mamej txutxej*, "padres". Not all nouns from these categories carry an absolutive marker, e.g. *kolq'ab*, "anillo" or *winaq unin*, "niño" (Q'anjob'al 2005: 93, 94).

[242] As judged by the examples provided, such as *k'uule*, "estómago" vs. *jak'uul*, "tu estómago" and *koole*, "güipil" vs. *jinkoolan*, "mi güipil" (Akateka 2007: 133). Body parts are the most common category of nouns to bear the absolutive suffix (Méndez Martinez 2004: 97). There is one example provided of a relationship term, *b'ḁše*, "cuñado del hombre" (Zavala Maldonado 1992b: 40), although none of consanguinity. Derived nouns do not necessarily bear the suffix, e.g. *kolq'ab*, "anillo" (lit. "flojo-mano").

[243] The suffixes *–il* ~ *–al* regularly appear with certain unpossessed nouns, compare *ti'-al* with *s-ti'-tak* (Buenrostro Díaz 2009: 42, 49), where the latter possessed form is furthermore inflected with the plural suffix. The range of nouns that take the absolutive suffix covers certain body parts (of voluntary control), items such as *chen-al*, "olla"; and apparently certain places of the social world such as *k'alum-al*, "aldea" (Buenrostro Díaz 2009: 111, 197). But regarding the latter, it is unclear, if the description confuses or blurs with a collective or abstractive suffix (see the TOJ 'generaliser' examples). Perhaps the suffix is peculiar to San Mateo Ixtatán CHJ

TOJ	*-al*	NOUN [-POSS]	(Lenkersdorf 2002: 106)
TOJ	*-al*$_3$	ABSL	(Furbee-Losee 1976: 75, tab. 14)
TOJ	*-AL3*	ABSL	(Furbee-Losee 1981, II: 91)
QAN	*-ej*	NOUN [-POSS]	(Q'anjob'al 2005: 91)
QAN	*-ej*	NOUN [-POSS]	(de Diego Antonio et al. 2001: 30)
QAN	*-ej*	NOUN [-POSS]	(Martin 1977: 100-101)
AKA	*-e*	NOUN [-POSS]	(Méndez Martinez 2004: 97)
AKA	*-e*	NOUN [-POSS]	(Akateka 2007: 133)
AKA	*-e*	ABSL	(Zavala Maldonado 1992b: 40, 45-46)
AKA	*-e*	ABSL	(Zavala Maldonado 1992a: 97, 109, 141, 173, 209)[244]
POP	*-e*	NOUN [-POSS]	(Stratmeyer et al. 1966: 211)[245]
POP	*-e*	NOUN [-POSS]	(Popti' 2001: 109)
POP	*-e*	NOUN [-POSS]	(Delgado Rojas et al. 2007: 75)
POP	*-oj*	NEG.STAT	(Day 1973: 40)[246]
MCH	*-Vtz (?)*	ABSL (?)	(Palosaari 2011: 150)[247]

Table 24: Greater Q'anjobalan forms for the absolutive noun marker.

The best parallel for the absolutive marking of body parts, items of personal property and kinship terms for ClM comes from EM (cf. Zender 2004b: 197-198). These languages use a reflex of the pM **–(b)aaj*, e.g. MAM *–b'aj* (Rojas Ramírez, Ramírez López and Ramírez Jiménez 2002: 62), IXL *–a(j)* (Poma S. et al. 1996: 63), QEQ *–(b)ej* (Kockelman 2007: 346-349, tab. 2), KAQ *–aj* (García Matzar, Toj Cotzajay and Coc Tuiz 1999: 54) and TZU *–aaj* (Cholotio and García Ixmata 1998: 61-62). We have a deviating pattern in PQM (Santos Nicolas et al. 1997: 68-69), where *–b'ees* is used for kinship terms and *–is* ~ *–es* for body parts. The latter is of specific interest for ClM, as we find the same *–is* in ClM (Zender 2004b: 200-204).

This example is further evidence that some fossilised reflexes of pM, still preserved in EM, but otherwise lost in WM, were in use among ClM. The interesting question is why these specific forms were in use in ClM (as a Ch'olan language) and likewise, why they were lost, as all modern Ch'olan languages (and likewise Tzeltalan and Chujean) feature some *–Vl* form. As a reflex is likely preserved in Greater Q'anjobalan with *–e(j)*, I assume that **–aj* ~ **–ej* was present in pGQ and therefore pWM, and still in pGT. Almost all Mayan languages feature a *–Vl* suffix for a general, unspecified meaning of a noun (compare the kinship absolutive *–tzil* in YUK). One possible explanation is that the *–Vl* abstraction suffix was contextually and semantically altered in Ch'olan (as it was still present in ClM) to func-

and percolated from neighbouring TOJ. Certain nouns that receive a *–Vl* suffix upon possession (see Table 29) are marked by a *–Ø* suffix, such as *chik'*, "sangre" (Buenrostro Díaz 2009: 48).

[244] Several examples feature the absolutive suffix with personal items such as clothing, compare *k'o̥šk'om-e*, "sombrero" with *s-k'o̥šk'om*, "su sombrero".

[245] In accordance with other languages, *–e* occurs with (1) body parts, (2) articles of clothing, and (3) kinship terms, except derived ones (e.g. *ixal*, "wife" and *ichamil*, "husband"). It contrasts with an absolutive *–Ø* for other nouns. The suffix *–e* likewise functions as a pluraliser for the three noun categories mentioned before (Stratmeyer et al. 1966: 212).

[246] This suffix is only affigated to a stative predicate when it occurs in a negative statement (Stratmeyer et al. 1966: 212), e.g. *mat winaj-oj-in*, 'not man-ABSL-1SG.ABS', "I am not a man" vs. *winaj-in*, "I am a man". It however can also be used with lexical classes other than nouns, e.g. *mat ewi-oj*, "it was not yesterday" (Day 1973: 40). Thus, the suffix cannot be considered as an absolutive marker in the definition of test group 1, as it is not mutually exclusive to a *–Ø* possessive suffix.

[247] No examples or contexts are provided, but nouns to take this suffix when unpossessed are said to be extremely rare, according to data by Kaufman. Whether these "nouns of expected possession" therefore feature such a kind of absolutive suffix cannot be answered with certainty.

tion as the absolutive and diffused from there to Tzeltalan and Chujean. One supporting clue comes from TOJ, where Lenkersdorf (2002: 106-107, 110) terms *–al* a ‘generaliser’ suffix, with the subletive (obligatory possessed) *–’ajwal*, “patron, señor” versus the unpossessed (absolutive) *’ajwalal* as “patron en general”. This suffix is similar to the absolutive, but does not alter the base lexeme into some ‘X-ness’.

For the phonemic reconstruction and spelling pattern hypothesis for ClM, we therefore have to solely rely on pM and EM linguistic evidence – paired with the epigraphic proof that *–aj* in fact serves as the ClM absolutive marker, as evidenced by Zender (2004b). As pM and EM feature long vowels we have to assume shorting for ClM, and as the majority exclusively feature /a/ as the suffix vowel, we can surely infer ClM *–aj*, thus also **Ca=ja** / __# spellings.

In vernacular contexts, however, we might expect *–Vl* forms, realised by **CV=lV** spellings. None has yet been described among the epigraphic data, so no prediction can be made for the actual syllabogram vowel. But if *–il* and *–al* are the predominant forms, it is only to ask whether the **lV** sign would be harmonic, i.e. **Ci=li** ~ **Ca=la**.

Branch	Paradigm	Spellings	Schemes
Common Ch’olan	*√-aj*	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√-[a]j	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
	√-tzil	**CV$_1$-CV$_1$=tzi-li / CV$_1$C(-CV$_1$)=tzi-li**	-
Eastern Ch’olan	* *√-bil*	**CV$_1$-CV$_1$=bi-li / CV$_1$C(-CV$_1$)=bi-li**	-
Western Ch’olan	* *√-V$_S$l V$_S$={a,i}*	**CV$_1$-CV$_S$=lV / CV$_1$C-CV$_S$=lV**	1.a,b,c,d.i
	* *√-[V$_S$]l*	**CV$_1$-CV$_1$=lV / CV$_1$C(-CV$_1$)=lV**	2.a,b,c,d.i (2.e.i)
Yukatekan	*√-Ø*	**CV-CV / CVC(-CV)**	-
	**√-tzil*	**CV$_1$-CV$_1$=tzi-li / CV$_1$C(-CV$_1$)=tzi-li**	-
Tzeltalan	* *√-V$_S$l V$_S$={a,i}*	**CV$_1$-CV$_S$=lV / CV$_1$C-CV$_S$=lV**	1.a,b,c,d.i
	* *√-[V$_S$]l*	**CV$_1$-CV$_1$=lV / CV$_1$C(-CV$_1$)=lV**	2.a,b,c,d.i (2.e.i)

Table 25: Representative, linguistically induced spelling patterns on junctures to be expected for the absolutive noun marker among Ch’olan, Yukatekan and Tzeltalan.

3.1.2 – Control Group 1

3.1.2.1 – Part/Whole Possession Marker *–el*

For the ‘true’ part/whole possession, there is only one suffix attested in Ch’olan (Table 26), which is *–e(l)* ~ *–er*. The suffix has several allomorphs (most notably *–il*), but which apply a different semantics (see footnotes 248 and 250).

Three applications of the part/whole possession marker can be distinguished in Ch’olan, and I will restrict myself to CHL examples. Firstly, we can identify the suffixation of *–el* in compounds, e.g. *bʌquel ejʌl*, “diente” (literally “mouth-bone”) or *bʌquel jolʌl*, “calavera” (literally “head-bone”) (Aulie and de Aulie 1978: 9) from *bac*, “hueso”. It is also used in impersonal expressions, e.g. *i tye’el otyot*, “la madera de la casa” (Warkentin and Scott 1980: 18). These constructions are embedded in a possessive phrase (where a specific possessor is mentioned) and are thus not compounds as in the first examples.

They can be compared to the ClM "miscellaneous category of possession involving stones, periods of time, signs, and payment" (Houston, Robertson and Stuart 2001b: 26), which might relate to part/whole possession, as already indicated by the authors (Houston, Robertson and Stuart 2001b: 26, 30-32). Most simple, the suffix is also added when there is an oblique possessor, e.g. *i pʌchʌlel*, "su piel" (Beekman and Beekman 1953: 23).

Common to all these examples is an intimate or obligatory relationship, for which body parts are paradigmatic. The compounded examples refer to osseous parts of other body parts (and also being without voluntary control) which are integral. The second category with a specific possessor also refers to essential, typical parts of a bigger whole, as in a traditional Maya house (cf. Wachoupe [1938] on various aspects of building construction), wood is used for the supporting elements. The simple suffixation to a possessed noun is related and again indicates an integral part (see footnote 250).

Idiom	**Attestations**		**Sources**
pCh	n/a		
ECh	n/a		
CHT	*-el*	body parts	(Sattler 2004: 383)
CHT	*-el ~ -Vl*	property	(Robertson, Law and Haertel 2010: 185)
CHR	*-er*	[+POSS] (inalienable)	(Wichmann 1999: 129)
CHR	*-er, -ir*	[+POSS] (body parts)	(Pérez Martínez 1996: 27)
CHR	*-er, -ir*	[+POSS]	(Ch'orti' 2004: 108-109)[248]
CHN	*-e(l)*	[+POSS] (part-relation)	(Knowles 1984: 196-197)[249]
CHN	*-e, -i, -a, -le*	[+POSS] (innate)	(Keller and Luciano 1997: 426-427)[250]
CHL	*-el*	few terms for body parts	(Warkentin and Scott 1980: 14, 117)
CHL	*-el*	body parts (not controlled)	(Bricker 1986: 41)
CHL	*-el*	NMLS	(Attinasi 1973: 153)[251]

Table 26: Ch'olan forms for the part/whole possession marker.

Without any exception, Yukatekan languages (Table 27) feature an invariable *–el* suffix for inalienable possession. The only allomorph given is *–ul* for Colonial YUK, but is not further explained and must remain speculative.

Yukatekan primarily features similar affixation patterns than Ch'olan. In the list of ITZ body parts provided by Hofling and Tesucún (1997: 81-83), we find both simple nouns upon possession (or

[248] The form *–er* occurs with body parts that are not of voluntary control, e.g. *uchicher*, "su vena". On the other hand, *–ir* also is suffixed to body parts, but eventually with a change of meaning, e.g. *jor*, "cabeza" vs. *kajorir*, "nuestro dirigente". The contrast to autonomous body parts with *–er* is also visible with *u-bajk'-ir*, "its joint (e.g., of hand)" (Wichmann 1999: 129) which is a body part under voluntary control. It may also be used, when a body part is detached, as the following example (Oakley 1966: 245) suggests: *uwe'ir e wacax*, "his meat of him the cow". The suffix also appears with other nouns, thus *–ir* cannot be considered a true allomorph to *–er* from a semantic perspective.

[249] Allomorphs are *–a(l) ~ –i(l)*, but these are not described to occur with body parts to mark an inherent possession.

[250] Among the given examples, only *–e* appears with body parts to mark possession, the others mostly appear with nouns to change their meaning upon possession, e.g. *u tz'aca*, "su condimento" < *tz'ac*, "medicina". The contrast between the absolutive –Ø and the part/whole possession is visible in the following set: *u pa' ch'ich'*, "su sangre (para comer)" vs. *u ch'ich'e*, "su sangre (que corre por su cuerpo). Also compare to the evidence cited for ITZ (footnote 253).

[251] Some of the examples described for the control group 3 nominaliser can be attributed to the possession marker: *√č'ič'/*, "blood" vs. *č'ič'el*, "specific blood" and *√¢u¢/*, "hair" vs. *¢u¢el*, "hair".

when being an attached body part) and compound forms with the part/whole suffix, again with a selection of those only that are not under voluntary control, e.g. *k'ik'el*, "blood" or *tzo'otzel pol*, "hair". We also find other compounds that describe diseases (as inherent to a specific body part, see footnote 254). Constructions involving *–el* not referring to body parts are not known from ITZ (e.g. *che'il naj*, "timber [lit., wood of house]") and MOP (e.g. *uche'il [a naja]*, "the wood [of the house]") and apply a different suffix[252] while we have different evidence from YUK (see footnote 258).

Idiom	Attestations		Sources
ITZ	*-el*	[+POSS] (inalienable)	(Hofling and Tesucún 2000: 112, 117, 263-264)[253]
ITZ	*-el*	[+POSS] (inalienable)	(Hofling and Tesucún 1997: 23)
ITZ	*-el*	[+POSS] (body parts)	(Itza' 2001: 80)
ITZ	*-el*	inalienable body parts	(Hofling 1991: 16-17)
ITZ	*-el*	[-POSS] (noun compound)	(Hofling and Tesucún 2000: 129)[254]
MOP	*-el*	[+POSS] (inalienable)	(Schumann Gálvez 1997: 95)[255]
MOP	*-el*	[+POSS] (inalienable)	(Mopan 2001: 104)
MOP	*-el*	[+POSS] (inalienable)	(Hofling 2011: 26)
LAK	*-el, -en*	[+POSS] (obligatory)	(Bruce 1968: 65, 66-67)[256]
LAK	*-e*	[+POSS]	(Kováč 2012: 2)[257]
YUK	*-el*	[+POSS] (own body parts)	(Smailus 1989: 114-115)
YUK	*-el*	desubstantive stem	(McQuown 1967: 240)
YUK	*-el*	[-POSS] (noun compound)	(Seler 1902-23, I: 115)[258]
YUK	*-el ~ -ul*	inalienable relation	(Swadesh, Álvarez and Bastarrechea 1970: 23)
YUK	*-el*	body part (voluntary control)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 359, 360)

Table 27: Yukatekan forms for the part/whole possession marker.

[252] Hofling (2011: 26) specifically mentions that "*–il* may also indicate 'part of', 'place of' and 'place of origin' relations." The ITZ and MOP cases are comparable to the CHL 'impersonal possession'.

[253] When body parts are detached, the suffix is not affigated, unless the possessor is known. There is another interesting contrast among possession marking, when the possessor is inanimate, the suffix *–il* is used instead, e.g. *u-b'äk-il keej* '3SG.ERG-bone-POSS deer', "deer meat (of a dead animal)" (Hofling and Tesucún 2000: 108).

[254] The proposed inherent possession expressed by a nominal compound mentioned in Chapter 2.1.1.2 is demonstrable for ITZ by the example *ix-k'ux+b'ak-el-il* 'FEM-bite+bone-POSS-ABSTR', "bone-pain". The other examples (Hofling and Tesucún 2000: 129) of diseases show other *–Vl* possessive suffixes typically associated with non-inherent body parts (e.g. *ix-k'ux+pol-il*, "headache").

[255] When detached, the body part takes a *–Ø* suffix, e.g. *in bakel*, "mi hueso (inalienable)" vs. *in bak*, "mi hueso (adquirido)".

[256] There seems to be some confusion with the use of *–el* and *–en*. While the former clearly refers to the inalienable body part possession (e.g. *bək'-el*, "carne de, cuerpo"), *–en* seems to derive nouns for body parts out of adjectival roots, e.g. *¢'om-en*, "seso(s)" < *¢'uʔum*, "blando, pulpa". There is also confusion with the homophonous *–el* nominaliser (Chapter 3.1.6).

[257] In contrast to other Yukatekan languages, at least the northern dialects of LAK seemingly may allow a phonemic process [l] > [Ø]. While used in possessive phrases, it is uncertain from the available data, whether a distinction between own and detached body parts is made, as the following examples show: *yah in bake*, "duele mi hueso" and *kuhantik a[h] pek' u bake yuk*, "come el perro el hueso del venado". Impersonal intimate possession has not yet been reported, a case parallel to CHL and ITZ for timber does not feature a suffix in LAK: *u che' in watoch ne chich*, "la madera de la casa es (muy) dura" (Kováč 2012: 2).

[258] Tozzer (1921: 49), in connection with *–il*, states that the affixation in a possessive phrase is more about "[…] a natural and often inseparable relationship between the possessor and the thing possessed." Seler (1902-23, I: 115) adds that "[…] wenn der betreffende Gegenstand zu einer dritten Person gehört und diese dritte Person ausdrücklich genannt ist, das Possessivpräfix der dritten Person als überflüssig nicht gesetzt ist" which calls for a noun compound of inherent possession (see footnote 254 for ITZ). He provides the following contrasting pair: *u ch'een in yum*, "der Brunnen meines Vaters, d. h. welcher meinem Vater gehört, welcher Eigenthum meines Vaters ist" and *ch'en-el in yum*, "der Brunnen, aus dem mein Vater sein Wasser nimmt." Note the difference in semantics. Because *–el* is suffixed, this construction is not like the attributive noun function (see Chapter 3.1.2.2 and footnote 275) by *–il* in Colonial and modern YUK.

For pTz, Kaufman (1972: 149) reconstructs a generic *–*Vl* suffix, although he admits that the suffix is chiefly *–*el*. This pattern is exclusive in Tzeltalan (Table 28). Other suffixes of a –*Vl* shape (see footnote 261 are likely attributed part/whole possession because of confusion with other possessive markers.

Idiom	Attestations		Sources
pTz	*-*Vl*-$_2$	[+POSS] (body parts)	(Kaufman 1972: 149)
TZE	*-el*	[+POSS]	(Kaufman 1971: 105-106)
TZE	*-el*	[+POSS]	(del Moral 1988: 396)[259]
TZO	*-el*	body part	(de Delgaty and Ruíz Sánchez 1978: 384)
TZO	*-el*	[+POSS]	(Haviland 1981: 207-208)[260]
TZO	*-il, -el, -al*	[±POSS]	(Hopkins 1967b: 15)[261]

Table 28: Tzeltalan forms for the part/whole possession marker.

The evidence from Greater Q'anjobalan (Table 29) differs from the other WM languages and adheres more to EM (see below). The –*el* is largely absent, but we have a coherent marking with –*il* ~ –*al* that are morphophonemically conditioned by the root vowel (with varying patterns across the individual languages). Among some languages, e.g. AKA, we also have indications that ~ –*al* is a semantically conditioned allomorph, as it also appears with non-body parts (Méndez Martinez 2004: 97)[262].

The semantics have not yet satisfactorily been described for Greater Q'anjobalan languages, but certain body parts are again among those nouns to take the suffix. There are indications that no functional and thus phonemic distinction of suffixes for other environments of partitive possession are made. Such categories, as known from other WM members, lack deeper grammatical description.

Idiom	Attestations		Sources
CHJ	*-il /CaC ~ -al*	[+POSS]	(Hopkins 1967a: 95-96)[263]
CHJ	*-il*	[+POSS]	(Domingo Pascual 2007: 117)
CHJ	*-il ~ -al*	[+POSS]	(García Pablo and Domingo Pascual 2007: 111-112)

[259] It is interesting to observe that for TZE, *ch'ich'*, "blood" (Slocum and Gerdel 1971: 136) is the only example described to take –*el* upon possession. This is similar to the TZO evidence cited (de Delgaty and Ruíz Sánchez 1978: 384), which is provided as the exception to take –*el* when the blood is part of the body, otherwise it takes no suffix.

[260] It is interesting to note that unpossessed examples of inherent body parts retain the –*el* suffix, but additionally receive an absolutive suffix, e.g. *bakelil*, "hueso de algo (indefinido)".

[261] Hopkins does not carefully distinguish between the absolutive –*Vl* marker and the semantics of the different homophonous possessive markers: "[t]here appears to be a formal distinction between nouns inherently possessed and other nouns. Parts of plants and some parts of the body take suffixes of the shape Vl when possessed; animals and geographical features do not ordinarily take these suffixes, but will if they are in possessive phrases in which the possessor is specified." It is to question whether some nouns take a homophonous absolutive and possessive suffix, e.g. *ʔib'-el*, "root" vs. *y-ib'-el*, "its root".

[262] However, such possessive constructions also mark intimate relationships, as –*il* ~ –*al* "[…] se aplica a los sustantivos que se refieren a huesos del cuerpo humano[,] carne del cuerpo humano, corteza de árbol, lo dulce del azùcar [sic!], lo amargo del cafè [sic!], lo caliente del agua, lo sucio de la camisa, etc." (Méndez Martinez 2004: 97). Zavala Maldonado (1992b: 46) quotes morphophonemic reasons, namely –*al* / iC__ and –*il* / aC__.

[263] No proper part/whole possession marker of body parts is distinguished in CHJ. This suffix, also used in compounds, derives "an X kind of thing, the X-like parts of something, or an X which belongs to something", e.g. *s-kélem-tak-il čóN-ap*, "the young men of a village". It therefore equals the 'normal' partitive possession in –*il* ~ –*al* described for other Mayan languages, including ClM (Houston, Robertson and Stuart 2001b: 26-30).

CHJ	*-il ~ -al*	[+POSS]	(Buenrostro Díaz 2009: 47, 51, 114)
CHJ	*-el*	[+POSS]	(Buenrostro Díaz 2009: 68, 216)[264]
TOJ	*-il$_4$*	[+POSS]	(Furbee-Losee 1976: 75, tab. 14)
TOJ	*-IL3*	[+POSS]	(Furbee-Losee 1981, II: 96)
QAN	*-il*	[+POSS]	(Q'anjob'al 2005: 92)
QAN	*-il*	[+POSS]	(de Diego Antonio et al. 2001: 31)[265]
AKA	*-il ~ -al*	[+POSS]	(Zavala Maldonado 1992b: 46-47)[266]
AKA	*-il, -al*	[+POSS]	(Akateka 2007: 123, 132)
AKA	*-il, -al*	[+POSS]	(Méndez Martinez 2004: 97)
POP	*-al ~ -il*	[+POSS] (inseparable)	(Day 1973: 47)[267]
POP	*-al ~ -il*	[+POSS] (part/whole)	(Delgado Rojas et al. 2007: 79)
POP	*-(h)al ~ -(h)il*	[+POSS] (part/whole)	(Popti' 2001: 108)
MCH	n/a		

Table 29: Greater Q'anjobalan forms for the part/whole possession marker.

The part/whole possession marker is widespread among all Mayan languages (cf. Houston, Robertson and Stuart 2001b: 9), where it most commonly follows a fixed vowel *–el* pattern, although *–il ~ –al* are known as well to possibly differentiate semantics by the vocalisation of *–Vl*, compare to KCH (Kaufman 1990: 69-70). Relevant to ClM, we can reconstruct an exclusive pCh **–el* based on the WM evidence when concerning body parts and certain cases of inherent possession.

Interestingly, as with Greater Q'anjobalan, we also find *–el ~ –il ~ –al* among other EM languages, while the latter two allomorphs likewise are not necessarily restricted to part/whole possession, e.g. MAM *–el* (Rojas Ramírez, Ramírez López and Ramírez Jiménez 2002: 62), IXL *–al ~ –il* (Poma S. et al. 1996: 63), PQM *–el* (Santos Nicolas et al. 1997: 68), QEQ *–el* (Alberto Tzul and Tzimaj Cacao

264 Although no other grammar specifies the *–el* suffix in Greater Q'anjobalan, two examples in connection with *te'*, "altura", at least point to a dialectal variant in the CHJ of San Mateo Ixtatán, if body height is considered as an intimate possessed feature of an individual: *a in-tik cha'anh in-te'-el* 'TOP 1SG.ABS-DEM alto 1SG.ERG-tamaño-POSS', "[y]o soy alto." The suffix can also be considered as an allomorph to the regular *–Vl* possessive suffix, also used in 'genitive' constructions, e.g. *s-tz'ib'-ul* (Buenrostro Díaz 2009: 74). However, some examples remain unclear from their context, such as in *a jun y-ol k'o'ol tik ay-Ø y-atz'am-il* 'TOP uno 3SG.ERG-dentro estómago DEM exist-3SG.ABS 3SG.ERG-sal-POSS', "[l]a comida tiene sal" (Buenrostro Díaz 2009: 95), where 'salt' is either inflected because of the stative construction or because it is an integral part of the dish.

265 The source does not clearly relate the suffix to any specific function. However, the examples *inchik'il*, "mi sangre" and *inb'aqil*, "mi hueso" indicate the inherent part/whole relationship of body parts with this form. It can clearly be distinguished in function from the allomorph *–al*, which is used for possessed relationship terms, e.g. *unin*, "niño/a" vs. *yuninal*, "su hijo/a" (Q'anjob'al 2005: 92).

266 The examples provided further support that AKA nouns carrying a possessive suffix allomorph are not restricted to certain noun classes (e.g. body parts of unvoluntary control). Besides such cases, the use of the possessive suffix alters the semantics, indicating a blur with abstractive suffixation (Zavala Maldonado 1992b: 46-47): "Es por esa razón, que nombres de la *subclase 1* [i.e. non-possessible nouns] pueden adscribirse secundariamente a esta clase mutando su significado, como por ejemplo: 'estrella' (*weykan*) que poseída, ya no representa al objeto sino a la figura o a un dibujo del objeto en algún telar o en la cerámica." Compare the examples (Zavala Maldonado 1992b: 47) of *s-winax-il*, "[s]u virilidad, su órgano sexual masculino" (the more abstractive sense of *winax*, "hombre") with *s-neet-al tš̥ul-e*, "[v]ejiga, bacinica" (the more inalienable relation between *neet*, "traste" with *tš̥ul-e*, "orín").

267 Morphophonemically, we have *–il* / √aC__ and with *chik'*, "blood", otherwise *–al*. Although blood is paradigmatic for the part/whole possession marker, the POP suffix use does not seem to be restricted to body parts. Examples like *–ixal*, "wife" < *ix*, "woman", *–caxil*, "redness" (Day 1973: 47) or *stz'ib'al*, "la letra de (algo)" (Popti' 2001: 108) further suggest that the intimate possession, as outlined by Houston, Robertson and Stuart (2001b: 31, fig. 14) for the ClM *–el* (see Chapter 2.1.1.2), possibly has a semantic intersection with the abstractive (cf. Houston, Robertson and Stuart 2001b: 32). A POP suffix *–e* (Day 1973: 47) is apparently used for intimate possession in Zender's (2004b) sense, thus similar to ClM *–is*.

2004: 56)[268], KAQ *–el ~ –il* (García Matzar, Toj Cotzajay and Coc Tuiz 1999: 53-54) or TZU *–eel ~ –iil ~ –aal* (Cholotio and García Ixmata 1998: 61).

With regard to the spelling patterns, we may assume a regular **Ce=le** / __# pattern, although deviations are known which provide a good case against the morphosyllabic model (Gronemeyer 2011b: 331-332). However, these may also be the result to (underspelled) morphophonemic processes[269].

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-el*	**CV$_1$-Ce=le / CV$_1$C-Ce=le**	1.a,b,c,d.i
		CV$_1$-Ce=lV / CV$_1$C-Ce=lV	1.b,d.i,ii
	√-[e]l	**CV$_1$-CV$_1$=le / CV$_1$C(-CV$_1$)=le**	2.a,b,c,d.i (2.e.i)
Eastern Ch'olan	n/a		
Western Ch'olan	n/a		
Yukatekan	*√-el*	**CV$_1$-Ce=le / CV$_1$C-Ce=le**	1.a,b,c,d.i
		CV$_1$-Ce=lV / CV$_1$C-Ce=lV	1.b,d.i,ii
	√-[e]l	**CV$_1$-CV$_1$=le / CV$_1$C(-CV$_1$)=le**	2.a,b,c,d.i (2.e.i)
Tzeltalan	*√-el*	**CV$_1$-Ce=le / CV$_1$C-Ce=le**	1.a,b,c,d.i
		CV$_1$-Ce=lV / CV$_1$C-Ce=lV	1.b,d.i,ii
	√-[e]l	**CV$_1$-CV$_1$=le / CV$_1$C(-CV$_1$)=le**	2.a,b,c,d.i (2.e.i)

Table 30: Representative, linguistically induced spelling patterns on junctures to be expected for the part/whole possession marker among Ch'olan, Yukatekan and Tzeltalan.

3.1.2.2 – Attributive Nominal Suffix –*V$_1$l* ~ –*el*

Surprisingly, adjectival morphology and derivation has not found a wide discussion in Mayan linguistics. While the current state of epigraphic research (Chapter 2.1.1.2) considers attributive adjectives to be derived from nominal roots (Houston, Robertson and Stuart 2001b: 33, tab. 9), the linguistic support is actually quite weak. It rather seems that the nouns in question remain in their lexical class upon *–Vl* suffixation (which is mainly root vowel harmonic) and only semantically approximate an adjectival meaning.

It is important to distinguish three different processes which feature a similar *–Vl* suffixation and that also need a careful application of the term 'nominal'. It may refer to both adjectives and nouns as a common denominator. As roots from both classes are involved in attributive formation, it is apt to call *–Vl* an attributive nominal suffix first. Then, it can further be specified whether it derives a root within the same lexical class or not – thus being an attributive adjectival or substantival suffix.

Houston, Robertson and Stuart (2001b: 3, 47) state that nouns may qualify another noun following "by abstracting a property", thus acting "in an adjectival manner." This is best seen by the lin-

[268] Kockelman (2007: 345) mentions just four words in QEQ that actually take this suffix when possessed, while some variation in the suffix vowel occurs: *tz'uum-al*, "skin", *baq-el*, "bone", *ich'm-ul*, "vein/artery" and *kik'-el*, "blood".

[269] See *t'o<h>x-aj aj pakal ta[h]n ti bak-el-a[l]?* on CML Urn 26 Pdt. 15, A3-A6 with the **ti ba-ke=la** spelling which might indicate an underspelled *–al* suffix of inherent possession. See the example from Morán (Houston, Robertson and Stuart 2001b: 10) with *m-ayan u-ch'ak-ib-il ne te'*, where the axe is considered as an integral part of the process of chopping the tree. The same may hold true for the bones used in the act of self-sacrifice shared by *Aj Pakal Tahn*.

guistic evidence from YUK (see below). The same authors (2001b: 6) also consider three adjectival categories: (1) root adjectives which cannot be possessed or stand alone, (2) nouns as adjectives and (3) derived adjectives[270]. A fourth case could be added with qualifying participles (see footnote 744 for examples).

Some linguistic evidence is compiled by Houston, Robertson and Stuart (2001b: 12-14) for the *–V_1l* suffixation of adjectives in attributive function – which is widely known among Mayan languages. Therefore, such ADJ+Vl forms will be included as well for comparison with NOUN+Vl forms in the linguistic data compilation.

The affixation of *–Vl* suffixes to mark or derive a general adjectival function is not just restricted to these cases, but positional roots and verbs (as the statives / participles) can also be the basis. These cases are included among the linguistic evidence as well for comparison, as they may account for a general pattern in adjectival formation.

Another scheme for adjectival derivation (not necessarily restricted to attributive function) is the partial or complete reduplication of the root, e.g. CHL *haʔ-aʔ*, "aquatic" < *√haʔ*, "water" (Attinasi 1973: 110-111). In different Ch'olan languages, it is also used for modifying the quality of the adjective, e.g. diminutive, moderative and augmentative, or the comparative or superlative among individual languages (cf. Attinasi [1973: 110] for CHL, Ch'orti' [2004: 150] for CHR, and Knowles [1984: 261] for CHN)[271], frequently with certain suffixes to follow (cf. Oakley 1966: 246). Reduplication might be the only way to derive adjectives as e.g. in CHR (Wichmann 1999: 139-144). CHN furthermore features it to form attributives, along with the *–Vl* suffixation as an alternative (Keller and Luciano 1997: 477-480).

While the root vowel harmonic *–V_1l* suffix is the general rule in Ch'olan (Table 31) for both adjectival and substantival attributives as well as positional statives, there are notable exceptions. CHN has a harmonic suffix for stative participles only, we observe *–al* ~ *–il* for attributives, similar is CHT with *–il* as the nominal attributive. CHR does not use suffixes at all for adjectives in attributive function (Ch'orti' 2004: 122). An interesting exception is CHL, which has an enclitic *–bʌ* for adjectival attributives. No reconstruction for pCh has been made, but **–V_1l* seems likely for nominal attributives and stative positionals, as well as for verbs in attributive function, as there is strong evidence from all Ch'olan languages except CHL.

[270] I see some problems with this categorisation. When root adjectives are supposed to be unable to stand alone, this definition is fuzzy. Root adjectives may very well stand alone when suffixed by an absolutive pronoun, e.g. *yax-Ø*, "it is green". The example for the second category given is *ch'ok ajaw*, "youth lord", but such constructions may rather be viewed as substantival compounds. Of interest for the attributive nominal suffix is how the second and third category overlap and are marked.

[271] For ClM, see e.g. **ya=YAX** < *ya-yax* on OAG St. 1, A11, PAL T19B-S, Z1a and CHN CC-HB, 7. Even though the texts in Chichen Itza make wider use of syllabic spellings and complementation, all cases cited are very strong arguments for reduplication to indicate an intensification "very green", as **YAX** is usually not complemented and preposed complements are generally very rare (especially with OAG St. 1 as a 9.7. monument).

Idiom	Attestations		Sources
pCh	n/a		
ECh	n/a		
CHT	*-il*	ATTR < NOUN,ADJ	(Sattler 2004: 389, 393)[272]
CHT	*-Vl*	ATTR < VER.TR.R	(MacLeod 1987: fig. 10)
CHT	*-Vl*	PTCP < POS	(Sattler 2004: 397)
CHT	*-Vl*	STAT < POS	(MacLeod 1987: fig. 10)
CHR	*-Vr*	ATTR < VER.TR.R	(MacLeod 1987: fig. 10)
CHR	*-Vr*	STAT < POS	(MacLeod 1987: fig. 10)
CHN	*-al*	ATTR,NOUN < ADJ	(Smailus 1975: 209-210)[273]
CHN	*-il ~ -l /CVCV*	ATTR < NOUN	(Knowles 1984: 254-256)
CHN	*-Vl*	ATTR < NOUN	(Keller and Luciano 1997: 479)
CHN	*-V(l)*	ATTR < ADJ (some)	(Knowles 1984: 241)
CHN	*-Vl*	ATTR < VER.TR	(MacLeod 1987: fig. 19)
CHN	*-V?*	ATTR < POS,VER.TR	(Knowles 1984: 247)
CHN	*-Ø*	STAT < ADJ (and most ATTR)	(Knowles 1984: 241)
CHN	*-Vl*	STAT < POS,VER.TR.R,VER.INTR	(Smailus 1975: 198)
CHN	*-Vl*	STAT < POS,VER.TR.R,VER.INTR	(MacLeod 1987: fig. 24)
CHN	*-V(l)*	STAT < POS,VER.TR,VER.INTR	(Knowles 1984: 245-247)
CHL	*-V(l) ~ -el*	ATTR < VER.TR.R	(MacLeod 1987: fig. 19)
CHL	*-b'ä*	enclitic for ADJ	(Kaufman 1990: 73)
CHL	*-bä*	ATTR < ADJ	(Vázquez Alvarez 2002: fn. 11)
CHL	*-bʌ*	ATTR < ADJ	(Warkentin and Scott 1980: 89)

Table 31: Ch'olan forms for the attributive nominal suffix.

The Yukatekan branch features similar patterns for attributive nominal derivation and marking (Table 32) as the Ch'olan languages. YUK commonly has suffixation with a synharmonic *–Vl* in its Colonial stage, but it is facultative in the formation of attributives (Smailus 1989: 126). A *–Vl* suffix is also used in Colonial YUK with an attributive stem or adjectival root to form the comparative (Beltrán 1859: § 27), but such forms are easily identified by their 3SG.ERG. It must not be confused with the *–Vch* intensifier or specifier of derived adjectives (Swadesh, Álvarez and Bastarrechea 1970: 23), as this is non-comparative.

ITZ forms both attributives and compound nouns with a *–Vl* suffix[274]. This pattern emerges even clearer in comparison with YUK. The attributive derivation from nouns with *–il* in Colonial and modern YUK (in the latter with *–*V_1*l* limited to some nouns only) often derives a meaning that semantically is an attributive adjective. But especially the evidence from Colonial YUK reveals that such constructions are not derived adjectives, but substantival compounds. The first noun suffixed with *–il* qualifies

[272] Sattler (2004: 394) speculates on a second attributive suffix *–a*, which is only attested by the example <*ɛana vinic*>, "testigo". The morphology is unclear, it could be an allomorph to a ~ **–V* suffix or, considering the lexicalised translation, an underspelled *–Vl* suffix.

[273] The two functions of the suffix need to be carefully distinguished and likely, both just happen to be homophonous. When not embedded in a possessive or otherwise nominal phrase, *–al* takes the otherwise widely attested function of an abstraction suffix, as e.g. with *t-u-toh-al*, "a su genuinidad". More of interest is the "subordinación atributiva del adjetivos bajo el nominal siguiente" (Smailus 1975: 209) which may not only produce adjectival attributives, but also an intrinsic (substantival) quality of the named that pertains to the possessor, e.g. *?u-noh-a kä-čič*, '3SG.ERG-large-ATTR 1SG.ERG-sister' as "the eldest of my older sisters" (Knowles 1984: 181).

[274] Several parts of speech may serve as the derivational basis. Especially with nominal roots (which show a preponderance for derivations), the derived adjective provides the quality as per the root semantics, e.g. *ch'up-ul*, "feminine" < *ch'up*, "woman" or *ka'n-al*, "tall, high" < *ka'n*, "sky". In compounds, these derived adjectives often are part of a lexicalised meaning, e.g. *chäk-äl=te'*, "mahogany tree" (Hofling and Tesucún 2000: 123).

the second, although adjectival meanings can be inferred[275]. A root-harmonic *–Vl* suffix is also used in all Yukatekan languages to derive the stative participle from a verbal root.

Reduplication of an adjectival root also occurs in Yukatekan, but it is mostly used for intensification in ITZ (Hofling and Tesucún 1997: 18, Schumann Gálvez 1971: 48), MOP (Hofling 2011: 21, Schumann Gálvez 1997: 75-76), and occasionally YUK (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 378). But YUK also features reduplication of substantival roots to derive adjectives (Smailus 1989: 124), but also to indicate the plural or diminution (Tozzer 1921: 96, 97). In MOP, reduplication may also appear to derive nouns out of adjectives (Schumann Gálvez 1997: 75). While Schumann Gálvez (1997: 98) only mentions *–ki(j)* to flag the quality of an adjective, Hofling (2011: 21-22) mentions *–Vl* for transitive roots and *–il* to derive from nouns. The data for LAK are insufficient[276].

Idiom	Attestations		Sources
ITZ	*-il ~ -Vl*	in bound forms/compounds	(Hofling and Tesucún 2000: 151, 154)
ITZ	*-al*	ATTR < NOUN	(Hofling and Tesucún 2000: 154)
ITZ	*-Vl*	STAT < VER.TR.R	(MacLeod 1987: fig. 43)
MOP	*-Ø*	ATTR < ADJ	(Mopan 2001: 205)
MOP	*-il*	ATTR < NOUN	(Hofling 2011: 22)
MOP	*-Vl*	STAT < VER.TR.R,VER.INTR,POS	(MacLeod 1987: fig. 43)
MOP	*-Vl*	STAT < VER.TR	(Hofling 2011: 22)
LAK	*-Vr*	STAT < VER.TR.R,POS	(MacLeod 1987: fig. 33)
LAK	*-Vl*	STAT < VER.INTR.R	(MacLeod 1987: fig. 33)
YUK	*-il*	ATTR < NOUN	(Smailus 1989: 118)
YUK	*-il*	ATTR < NOUN	(Seler 1902-23, I: 78, 113)
YUK	*-il, -al, -ol*	ATTR < ADJ	(Smailus 1989: 126-127)
YUK	*-Vl-(ah)*	ATTR < ADJ	(Seler 1902-23, I: 77-78)
YUK	-$V^{r}l$	STAT < VER.TR.R,VER.INTR	(Smailus 1989: 137)
YUK	*-Vl*	STAT < VER.TR.R,VER.INTR,POS	(MacLeod 1987: fig. 50)
YUK	-V_1l	ATTR < NOUN	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 334)
YUK	*-il* ~ -V_1l	ATRR < NOUN	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 378)
YUK	<\`V_1>…-V_1l	PTCP < VER.TR.R,VER.INTR,POS	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 373)
YUK	*-Vl*	STAT < VER.TR.R,VER.INTR,POS	(MacLeod 1987: fig. 33)
YUK	*-b'il*	ATTR < NOUN,VER.TR,AFF	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 378)

Table 32: Yukatekan forms for the attributive nominal suffix.

Tzeltalan uses a generic *–Vl* suffix to mark the attributive function of adjectives and nouns (Table 33), but its vocalisation differs among the two languages of the family. TZE has a root vowel harmonic form, while modern TZO (in contrast to Colonial TZO) has a fixed vocalisation with *–il ~ –al* allomorphs. The suffixation with one or the other alternant has not yet been discussed in relation to

[275] The examples for modern YUK are very clear and parallel the scheme and semantics from ITZ, e.g. *š č'up-ul*, "female" < *š č'up*, "woman lady" or *káʔan-al*, "high, above" < *káʔan*, "sky, height" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 378). In Colonial YUK, adjectival meanings are also given, e.g. *nachil vinic*, "hombre de lejos o extranjero" (Smailus 1989: 126), i.e. "foreign person" < *nach*, "forastero, foráneo, extranjero" (Barrera Vásquez 1993: 547). Other construction which seem to be nominal compounds can also be interpreted as adjectival attributives, e.g. *Madritiil vinic*, "hombre de Madrid" (Smailus 1989: 126), i.e. "Madrilenian person". Others are a hybrid between compounds and adjectival attributives, e.g. *kaknabil ch'ich'*, "pajaros de la mar" (Smailus 1989: 118), i.e. "seabird" < *k'ak'nab*, "mar", although *k'ak'nabil*, "marino, cosa de mar, marítimo" (Barrera Vásquez 1993: 567) and Spanish "ave marina".

[276] Judging from texts (cf. the *canto al chile* [Bruce 1968: 118-119]), LAK generally has, as MOP, *–Ø* for adjectives in both stative and attributive function, compare *ne sis ha'*, "el agua es (muy) frío" and *uk'e ha' sis* / *uke' sis ha'*, "bebe agua frío" (Kováč 2012: 2).

the root vowel. Examples provided (Haviland 1981: 177, Schuller 1925: 198) suggest a preference for *–il*, thus a general high / low and front / back contrast between root and suffix vowel[277]. However, not all adjectives in TZO require a *–Vl* marking (Haviland 1981: 178-179).

Based on the evidence, we can follow Kaufman (1972: 149) to reconstruct a pTz **–Vl* suffix, likely to be root-harmonic. Otherwise, I consider the preponderance for *–il* ~ *–al* to have developed only later in TZO. However, pTz might have shown slight preferences.

Reduplication is used in TZE for intensification, where it derives the adjective from several parts of speech (Berlin 1963: 216-218). It also is used for the adjectival diminutive (Haviland 1981: 185-186) in TZO.

Idiom	Attestations		Sources
pTz	**-Vl-*$_4$*, -il, -al*	ATTR < ADJ	(Kaufman 1972: 149)
pTz	**-*V_1l	STAT < POS	(Kaufman 1972: 147)
TZE	*-*V_1l *~ -al ~ -il*	ATTR < ADJ	(Kaufman 1971: 106)
TZE	*-il ~ -Vl*	ATTR < ADJ /CVC	(Robles Uribe 1962: 47)
TZE	*-*V_1l	ATTR < ADJ	(Hinmán Smith n.d.: 27-28)
TZE	*-*V_1l	ATTR < ADJ	(Hinmán Smith n.d.: 122)
TZO	*-Vl*	ATTR < NOUN	(Haviland 1988: 86)
TZO	*-Vl*	ATTR < ADJ	(Haviland 1988: 86)
TZO	*-Vl*	ATTR < ADJ	(Schuller 1925: 198)
TZO	*-il ~ -al*	ATTR < ADJ	(Haviland 1981: 176-177)
TZO	*-*V_1l	STAT < POS	(Haviland 1981: 240)
TZO	*-Rl*	STAT < VER.INTR,POS	(Cowan 1969: 12, 13)

Table 33: Tzeltalan forms for the attributive nominal suffix.

The Greater Q'anjobalan branch features a diverse set of suffixations (Table 34). Adhering to the *–Vl* pattern found in Ch'olan, Yukatekan and Tzeltalan are only two languages: TOJ with a generally root-harmonic suffix and POP with fixed-vowel *–il*. POP furthermore has a special case with *–la* when the attributive is preposed. No suffixation frequently takes place in an attributive function, but is the rule when the adjective is used as a stative.

CHJ, QAN, AKA and MCH generally are not using suffixation at all, AKA and POP only with colour terms. MCH is a special case, as it applies an auxiliary construction with the preposition *ti* for attributive adjectives (Palosaari 2011: 166), e.g. *man ti winaq*, "big man." The adjectival root remains unattached.

Idiom	Attestations		Sources
CHJ	*-Ø*	ATTR < ADJ	(Domingo Pascual 2007: 187)
CHJ	*-Ø*	ATTR < ADJ	(García Pablo and Domingo Pascual 2007: 138)
CHJ	*-Ø*	ATTR < ADJ	(Buenrostro Díaz 2009: 215)
CHJ	*-an*	ATTR < ADJ	(Williams and Williams 1966: 229)
TOJ	*-*V_Rl_1	ATTR < ADJ,NOUN	(Furbee-Losee 1976: 91)[278]

[277] This is especially true if the root vowel is low / back, for which we mostly have *–il*. Schuller (1925: 198) also provides other root-harmonic suffixes, e.g. *tot-ol hoo*, "agua turbia." This is indication that historically / dialectally, TZO also had a root-harmonic suffixation, like TZE.

[278] This suffix is not to be confused with the homophonous *–*V_Rl_2 (Furbee-Losee 1976: 96-97) used to derive abstractive nouns from nominal (and a few verbal and positional) roots.

TOJ	*-{a,i,u}l*	ATTR < ADJ	(Lenkersdorf 2002: 103)[279]
QAN	*-Ø*	ATTR < ADJ	(Q'anjob'al 2005: 106)
ÁKA	*-Ø*	ATTR < ADJ	(Akateka 2007: 203, 241)
AKA	*-Ø*	ATTR < ADJ	(Méndez Martinez 2004: 120)
AKA	*-Ø*	ATTR < ADJ	(Zavala Maldonado 1992b: 111-113)
AKA	*-in*	ATTR < ADJ (colour)	(Zavala Maldonado 1992b: 105)[280]
POP	*-il*	ADJ < NOUN,VER.INTR	(Day 1973: 49)
POP	*-Ø*	ATTR < ADJ	(Popti' 2001: 130)
POP	*-Ø*	ATTR < ADJ,NOUN	(Delgado Rojas et al. 2007: 99-101)[281]
POP	*-la* /_NOUN	ATTR < ADJ,POS	(Craig 1977: 10, 44-45)[282]
POP	*-la* /_NOUN	ATTR < ADJ	(Popti' 2001: 130)
POP	*-inh*	ATTR < ADJ (colour / animals)	(Popti' 2001: 130-131)[283]
POP	*-taj*	ADJ,ADV < various	(Day 1973: 48, 49)[284]
MCH	n/a		

Table 34: Greater Q'anjobalan forms for the attributive nominal suffix.

Suffixation in case of attributive function is also found among other Mayan branches (cf. Houston, Robertson and Stuart 2001b: 12-13). Some EM members likewise feature a *–V(l)* pattern, e.g. KCH and KAQ have enclitic *–a* ~ *–i* with monosyllabic adjectives (Seler 1902-23, I: 77-78), QEQ *–i* (Alberto Tzul and Tzimaj Cacao 2004: 102), TZU *–a* (Cholotio and García Ixmata 1998: 146). Other languages, like MAM (Rojas Ramírez, Ramírez López and Ramírez Jiménez 2002: 110) or IXL (Poma S. et al. 1996: 136) do not aggregate suffixes at all in attributive function.

Generally, the mechanisms of attributive nominal suffixation are not well described for most Mayan languages. Especially the question of substantives acting as attributives and their syntactic role remain obscure. The descriptive scarcity does not allow a decisive answer. Adjectives in attributive function clearly retain their lexical class when suffixed. Therefore, we may assume the same for substantives, and especially the YUK and ITZ cases point to nominal compounds, where the qualifying substantive preceding is suffixed.

As such, the $–V_1l$ suffix is merely a derivational suffix, but rather a marker for an attributive function. The claim made for ClM that $–V_1l$ derives proper adjectives (Houston, Robertson and Stuart 2001b: 33, tab. 9) is therefore unlikely. The preponderant $–V_1l$ evidence for ClM among proper attribu-

[279] A *–Vl* suffix, which usually mirrors the stem vowel (with *–il* / C{e,u}C) is habitually suffixed when the adjectival stem is used to qualify the following noun, in contrast, the suffix is *–Ø* when the adjective is used as a stative predicate.

[280] The suffix only appears as a facultative element with those roots that designate a colour. The scheme is similar to POP (see footnote 283), although not exclusive to animals.

[281] The examples provided do not show any difference of adjectival roots in predicative or attributive function. The suffix *–taj*, described to be a derivational morpheme from nouns, is otherwise the plural suffix of adjectives (Delgado Rojas et al. 2007: 99). While Day's (1973: 48, 49) examples prove a plain derivation from nouns, Delgado Rojas et al. (2007: 101) suggest that it is constrained to plural forms of qualifying nouns.

[282] The POP attributive adjective usually follows the noun and carries no further suffix then. When preposed, it mostly takes *–la*, when it is a colour adjective (but not with animals, otherwise *–'iŋ*), a positional stative in *–an* or any other adjective.

[283] The suffix is only used (regardless the adjective is preposed or following the noun) when the colour of animals is indicated, e.g. *saj'inh cheh*, "caballo blanco".

[284] The morpheme does not only derive adjectives to express the quality of the noun (e.g. *pojojtaj*, "dusty" < *pojoj*, "dust"), but also adverbs of adjectives (e.g. *ewantaj*, "secretly" < *ewan*, "dark") and it may alter the meaning of adjectives (e.g. *ya'taj*, "difficult" < *ya'*, "painful"). The suffix furthermore forms distributive numbers (Delgado Rojas et al. 2007: 94, Ross Montejo and Delgado Rojas 2007: 75-76) which can function as adverbs.

tive adjectival roots (Houston, Robertson and Stuart 2001b: 33-36, tabs. 9, 10) furthermore suggests that *–V_1l* with substantives is not a functionally different, homophonous form.

The attributive usage of substantives also raises the important question of the semantics of such qualifying compounds. Can we distinguish differences to regular nominal compounds that do not feature suffixation, e.g. between *k'ahk'-witz* (TRT Mon. 8, B21a), "Fire-Mountain" as the Tortuguero toponym (Gronemeyer 2006b: 40-41) and *k'ahk'-[a]l-jul*, "fiery spear" as the description of the torch visible on YAX Lnt. 24, D1?

When the *–V_1l* suffix is not derivational, we could rather classify it as a case of 'qualitative possession', indicating that a specific property expressed by the first adjective or substantive is 'belonging' to the noun following (cf. Chapter 3.1.2.1 that sometimes 'part/whole possession' with the *–el* suffix does not require a 3SG.ERG pronoun for a possessive phrase). The second substantive expresses the object that is made for the first substantive or pertains to it or enables it to come to being (Tozzer [1921: 38] already called such construction in YUK as "attributive relationship"). Christian Prager (personal communication, March 6, 2012) independently considered a similar thought: the appearance of a *–V_1l* suffix with substantives signifies a quality that is made to an object out of human action or more generic a non-intrinsic property[285]. This definition supports us to explain why the substantival *–V_1l* suffix is functionally and also likely semantically identical to the adjectival attributive[286]. The epigraphic analysis of such *–V_1l* suffixes should therefore consider the semantics to test the hypothesis, but considering the sometimes hard to reconstruct emic notion of intrinsic qualities[287].

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[285] Prager exemplified by the *k'ahk'-[a]l jul* spelling on YAX Lnt. 25. Fire is not an intrinsic quality to a staff (= torch). It needs to get lit and therefore the expression "lit-up staff" may carry the underlying meaning "fire belonging to the staff", "staff made for/enabling fire" or simply "staff of/with fire" (if the patterns from YUK are taken into account, see footnote 275). The same argument can be made for **ka-ka-wa=la u-lu** < *kakaw-al ul* (K2777, G-H) with the obvious meaning "cacao-flavoured atole" (Beliaev, Davletshin and Tokovinine 2009: 266) and the underlying meaning "cacao mixed into atole". Also compare to MCH that uses a prepositional construction to indicate such a relation.

[286] If this is the case, the frequent absence of a *–V_1l* suffix with adjectival roots, as the *argumentum e contrario*, should indicate an intrinsic quality. Compare to **K'AN TUN^{ni}** < *k'an tun*, "precious stone" (Stuart 1990b: 9) for a certain class of carved monuments or rather a nominal compound *k'a[h]n+tun*, "pedestal stone" (Lacadena and Wichmann 2004: 105, 146). Independent of the lexical class of the first noun, we seem to deal with an intrinsic quality of a carved, specifically used stone. Equally interesting is the question of stative forms. The absence of the *–V_1l* suffix with them might be explainable by the fact that they describe a state of being, thus (always?) an intrinsic quality.

[287] Prager (personal communication, March 6, 2012) considers that *k'uhul* (as unambiguously written by postponed graphemes) appeared considerable late in emblem glyphs and might be connected to a shift in perception of the authority of an *ajaw* (also see footnote 288). While in the Early Classic, the supreme authority of a Maya polity (cf. Grube 2000a) was a *k'uh-ajaw*, a "God-Ruler" with the intrinsic quality of being divine, he became a *k'uh-ul ajaw*, "Holy Ruler" with an attributed divinity. Possibly, such a shift in ideology was also only regionally surfacing (e.g. by the removal of previous royal dynasties). In general, it could parallel the situation in Ancient Egypt (cf. Blumenthal [2002] for an overview). From predynastic times on, Pharaoh was considered to occupy a sphere between the human earth and the godly skies, ideologically expressed by his association (but not equation, as suggested by earlier scholars, e.g. Frankfort 1948: 32-33) to Horus (Bickel 2009: 87-88) and later as *sȝ-rꜥ*, "Son of Re" (Silverman 1994: 71-72). By the number of epithets referring to Pharaoh (e.g. *njswt*, "king", *nṯr*, "god", *nb*, "lord", *ḥm*, "majesty", etc., cf. Windus Staginsky [2006] for a complete discussion), we can infer he was considered as a "multi-faceted composite being" (Silverman 1994: 66), but we need to differentiate between the office holder and the office itself. While both aspects were more accentuated in the Old Kingdom (thus exaggerating an implicit, intrinsic divineness), the New Kingdom differentiates more between the divine office and the human nature of the incumbent holder (Silverman 1994: 67, 72). This, in part, can be seen as a reflex by

Another problem already sketched in footnote 287 concerns substantival morphographs that also serve as the basis for attributive adjectives. As demonstrated by the linguistic evidence, not all languages and within these not every attributive always requires a suffix (e.g. CHN [Knowles 1984: 239], MOP [Schumann Gálvez 1997: 97-98]). Therefore, when epigraphy assumes a dual morphographic reading[288], we may actually erroneously deduce it by inflected spellings.

Basically all GLL languages provide substantial evidence that attributive nouns (adjectival and substantival roots) will take a $-V_1l$ suffix, constrained by semantic premises (i.e. the kind of quality expressed). With the root harmonic suffix vowel, we most likely are to expect synharmonic spelling patterns **CV_1=CV_1** / __#. However, Houston, Robertson and Stuart (2001b: tab. 10) already noted a few disharmonic spellings **CV_2=CV_2** / __#, without discussing further implication. I suggest that these spellings are most likely no group 2 patterns (thus yielding a $-[V_1]l$ reconstruction). As the linguistic evidence from some GLL languages, but most plainly cognates from EM, shows, there are tendencies to replace $-V_1l$ by fixed vowel *–il* ~ *–al* allomorphs. This is in accordance with the Ch'olan evidence which also shows a preponderance for $-V_1l$ and an occasional application of fixed vowel *–il* ~ *–al* (Table 31). Thus, not only for ClM, but also for pCh, we can assume the same. That we find the same preference in members of both WCh and ECh does not necessarily point to a vernacular feature.

In any case, the epigraphic samples analysed will only deal with the ~ *–el* allomorph. Indeed, the $-V_1l$ attributive nominal suffix should rather be a control group 2 case, but the focus on one allomorph justifies the attribution to control group 1. The ~ *–el* can serve as the special case to compare the spellings of a true fixed vowel suffix with a root vowel-harmonic suffix of the same pronunciation.

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the commotions of the Second Intermediary Period, but also with Egypt becoming an imperialistic force in the Near East (Bedford 1994: 157-159, 173). The cases of *chan-al k'uh* and *kab-al k'uh* (e.g. K2796, Q3, R2) also might reveal some insights into the nature of Classic Maya gods, if the assumption of non-intrinsic qualities with the $-V_1l$ suffix holds true. Following Prager (personal communication, March 6, 2012), theonyms are always only substantival compounds (e.g. *balun y-ok-te'* [Eberl and Prager 2005: 28]) or sentence names (cf. Colas 2004: 75-76, 89-94). Thus, *kab-al* and *chan-al* are not part of a theonym, but some attributive quality to a god or the *k'uh* concept (see footnote 759). But compare in contrast to the still obscure alternative name phrase of Ruler 15 *K'ahk' Yipyaj Chan K'awil* of Copan as *yax pas chan kab ajaw* (CPN St. N Base, 18-19, lacking *–Vl*), which Colas (2004: 265-266) interprets as a theonym with *ajaw* referring to a supernatural.

[288] One example (already mentioned in footnote 287) is the morphograph AMC as **K'UH** ~ **K'UHUL** (Ringle 1988), inferred by some complementations. Compare to (1) **K'UH=lu** or (2) **K'UHUL**^{lu} < *k'uh-[u]l* (IXZ St. 4, B4a), (1) **u=K'UH**^{ju}**=lu tza-ku** or (2) **u=K'UHUL**$^{ju=lu}$ < *u-k'uh-ul tzak* (YAX Lnt. 25, E1), (1) **K'U'=u-lu** or (2) **K'U'UL**$^{u-lu}$ < *k'u'-ul* on YUL Lnt. 1, C2. The latter two examples (the YUL case also representing a pYu vernacular [Gronemeyer 2011b: 327]) would exhibit a multiple complementation for possibility (2) which is extremely rare in Maya writing (cf. Mora-Marín [2008: fig. 2], also see below). The absence of a syllabogram together with the sign AMC in case of supposed adjectival functions thus might not be a matter of missing phonemic complementation for a **K'UHUL** reading. We can infer an adjective that is homophonous to the noun that is not requiring a suffix when used as an attributive (cf. MOP *k'uj*, "sagrado" [Schumann Gálvez 1997: 84]). Generally, the absence of a postposed syllabogram could merely be explained with the underspelling of a weak consonant suffix, otherwise we would expect a more even distribution of different spellings. The polyvalent reading as **K'UHUL** was recently disproved by a context analysis of all allographs by Prager (2013: 86-188, 637-645), confirming the brief defence in favour of **K'UH** by Jackson and Stuart (Jackson and Stuart 2001). – The same complex of problems for a morphographic sign also arises with roots that typically take suffixation, as demonstrated by the case of **MUY** ~ **MUYAL** (cf. Gronemeyer 2006b: 28) when considering a spelling as either (1) **MUY**^{ya}**=la** or (2) **MUYAL**$^{ya-la}$ < *muy-al* (e.g. NAR St. 2, D18).

The obvious prevalence of integrating, synharmonic spellings is also a good showcase against morphosyllabic signs (cf. Gronemeyer 2011b: 326-327). If one follows the author's line of argumentation to the end, some regular **LV morphosyllable must be assumed.

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-V$_1$l*	**CV$_1$-CV$_1$=lV$_1$ / CV$_1$C-CV$_1$=lV$_1$**	1.a,b,c,d.i
		CV$_1$C=V$_1$-lV$_1$	1.e.i
	√-[V$_1$]l	**CV$_1$-CV$_2$= lV / CV$_1$C(-CV$_2$)= lV**	2.a,b,c,d.i,ii (2.e.i)
Eastern Ch'olan	n/a		
Western Ch'olan	* *√-V$_S$l V$_S$={a,i}*	**CV$_1$-CV$_S$=lV$_S$ / CV$_1$C-CV$_S$=lV$_S$**	1.a,b,c,d.i
	* *√-[V$_S$]l*	**CV$_1$-CV$_1$= lV / CV$_1$C(-CV$_1$)= lV**	2.a,b,c,d.i,ii (2.e.i)
Yukatekan	*√-V$_1$l*	**CV$_1$-CV$_1$=lV$_1$ / CV$_1$C-CV$_1$=lV$_1$**	1.a,b,c,d.i
		CV$_1$C=V$_1$-yV	1.e.i
	√-[V$_1$]l	**CV$_1$-CV$_2$= lV / CV$_1$C(-CV$_2$)= lV**	2.a,b,c,d.i,ii (2.e.i)
	* *√-V$_S$l V$_S$={a,i}*	**CV$_1$-CV$_S$=lV$_S$ / CV$_1$C-CV$_S$=lV$_S$**	1.a,b,c,d.i
	* *√-[V$_S$]l*	**CV$_1$-CV$_1$= lV / CV$_1$C(-CV$_1$)= lV**	2.a,b,c,d.i,ii (2.e.i)
Tzeltalan	*√-V$_1$l*	**CV$_1$-CV$_1$=lV$_1$ / CV$_1$C-CV$_1$=lV$_1$**	1.a,b,c,d.i
		CV$_1$C=V$_1$-yV	1.e.i
	√-[V$_1$]l	**CV$_1$-CV$_2$= lV / CV$_1$C(-CV$_2$)= lV**	2.a,b,c,d.i,ii (2.e.i)
	* *√-V$_S$l V$_S$={a,i}*	**CV$_1$-CV$_S$=lV$_S$ / CV$_1$C-CV$_S$=lV$_S$**	1.a,b,c,d.i
	* *√-[V$_S$]l*	**CV$_1$-CV$_1$= lV / CV$_1$C(-CV$_1$)= lV**	2.a,b,c,d.i,ii (2.e.i)

Table 35: Representative, linguistically induced spelling patterns on junctures to be expected for the attributive nominal suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.3 – Test Group 2

3.1.3.1 – Root Transitive Marker –*V$_1$* ~ –*V$_1$w* and Non-CVC Transitive –*V* Marker

One common feature in most Mayan languages is the differentiation of transitive and intransitive verbs by specific sets of suffixes, also (though not exclusively) reflecting mood and tense / aspect. Depending on the grammar (but also the language in a synchronic and diachronic perspective), these suffixes are named thematic, status or modal suffixes[289]. These suffixes also differ between root (in)transitive and derived verbs. For the ClM showcase, I will simply refer to a root or non-CVC transitive marker, as the case study ignores all other statuses apart from those used in historical narratives[290].

[289] Refer to Kaufman and Norman (1984: 92-93) for brief explanations on the terminology. For example, pM plain status combined what later diversified into incompletive and completive aspect in indicative mood, while the dependent status relates to the subjunctive aspect in conjunctive mood.

[290] This means that the subjunctive and imperative are largely excluded. Future statements have only recently caught attraction. One (for a derived transitive) is **xa=a-je=se** (TRT Mon. 6, K9), which, following Zender (2005b: fn. 5), had been interpreted as *–xa aj-es-Ø*, 'indeed wake-CAUS-3SG.ABS' (Gronemeyer and MacLeod 2010: fn. 62), but now (Barbara MacLeod, written communication, December 16, 2011) as *x-aj-es-Ø*, 'FUT-wake-CAUS-3SG.ABS', "they will awaken it" (in both cases with an ergative extraction). Another instance (for a root transitive) is found on PAL T21BF, N1, Y1 with **xa=k'a-la** as *x-a-k'al-a-Ø*, 'FUT-2SG.ERG-bind-SBJV-3SG.ABS', "you will bind it", analysed between Barbara MacLeod and Sven Gronemeyer in December 2011, complying with a Ch'olan –*V$_1$* subjunctive status marker. See Figure 105 for examples. The imperative is found in some direct speech statements (Beliaev and Davletshin 2006: 25, fns. 21, 23), e.g. **u-tz'u a=wi-tzi** < *u[h]tz'-u a-witz*, "Smell

For a discussion and overview of the development from pM to pCh and common Ch'olan root transitive status markers (Table 36), refer to Kaufman and Norman (1984: 92-94, 100-101, tabs. 11, 12), Kaufman (1994, A 3: 1-7, 12-16), Mora-Marín (2001: 53-56) and with special focus on ClM to Wald (2007: 217-222). Tracing the development of Ch'olan transitive status markers however provides several obstacles, as the data from its four members show. Most importantly, the position of ClM within the Ch'olan branch does not seem to fit the overall phonological evolution, as far as the epigraphic data are able to contribute.

For pM, we can reconstruct the root transitive plain status markers as *\–o-h* / __# (Kaufman 1994, A 3a: 1, Kaufman and Norman 1984: tab. 9) or *\–o-V_1* / __# (Kaufman and Norman 1984: tab. 9) and *\–o-w* / … (Kaufman 1994, A 3a: 1) and the dependent status marker as *\–a-ʔ* (Kaufman 1994, A 3a: 2, Kaufman and Norman 1984: tab. 9). The development of the plain status marker then supposedly produced pWM * *–(a-)w* (Kaufman 1994, A 3a: 12) / * *–a(w)* (Mora-Marín 2001: tab. 2.22) > pGT * *–a* (Mora-Marín 2001: tab. 2.22) / *\–V* (Kaufman and Norman 1984: tab. 10) > pCh *\–V* ~ *\–eʔ* [+INC] and *\–V* ~ *\–i* [+COM] (Kaufman and Norman 1984: tab. 11).

The pM derived transitive plain status marker was reconstructed as *\–h* or *\–V* (Kaufman 1994, A 3a: 1, Kaufman and Norman 1984: tab. 9) or *\–V_1* (Kaufman and Norman 1984: tab. 9). From there, the development was pGT *\–Ø* > pCh *\–Ø* [+COM] and *\–(V)n* [+INC] (Kaufman and Norman 1984: tabs. 10, 11)[291]. The *–Ø* [+COM] marker is retained in CHL, CHT and CHR, while CHN has *–i*, as with root transitives (Kaufman and Norman 1984: 96-99). More of importance are the stem formative suffixes preceding the *–Ø* status marker, either a non-CVC root transitive thematic or a transitivising suffixes to derive a verb from another lexical class. It however needs to be stressed that not all non-CVC transitives belong to this class, as several of them behave like regular CVC transitives without taking a stem formative suffix (cf. Kaufman and Norman [1984] for pCh verbal reconstructions).

Linguistic data are scant, MacLeod (2004: 311-312) provides an overview of Ch'olan stem formative suffixes and several lexemes known from ClM with their attested cognates. The thematic generally appears as *–V*, derivational suffixes have *–V* and *–CV* shape, depending on their semantics and the lexical class from which they derive. Of great importance are noun transitivisers that have developed from pM 'factive' *\–a* > pCh *\–ä*, 'applicative' *\–i* > *\–i* and 'superfactive' *\–ta* > *\–tä* (Kaufman 1994, A 9: 51-57, Kaufman and Norman 1984: 144-145). Reflexes are found in CHL and Tzeltalan, so forms identical to those of pM are expected for pWM and pGT.

Following Kaufman's data (as synthesised by Mora-Marín [2001: 53-54, tabs. 20, 22, 23]), we can observe two important phonological changes from the transition between pGT and pCh (at latest). Although the data bear some inconsistencies and ignore the development of the pM allomorphs we can highlight: (1) the loss of the final consonant and (2) the change from a single vowel to a variable vowel

your piss!" (NAR K1398, G1-H1). The suffix complies with the *–V_1* reconstructed for pCh (Kaufman and Norman 1984: tab. 11).

[291] One possible ClM example for the incompletive *\–(V)n* suffix is **u=TZ'AK=bu=nu** < *u-tz'ak-bu-n* (COB P. C, D1). See footnote 439 for further discussion.

among root transitives, as the plain status ceased to exist and was split into incompletive and completive. This vowel (Table 36) developed root-harmonic in CHT and CHL (and here –Ø for [+INC]) and to an aspect-depending fixed vowel in CHN (with *–e(')* [+INC] and *–i* [+COM]) and CHR (generally *–i* plus *–e* [+INC] / √ = CeC)[292].

A final question concerns the morphophonemics of the status marker when other suffixes (typically the absolutive pronoun) follow, an aspect of great importance for ClM (see below). Instead of alterations, we apparently observe the elision of the status suffix in CHR (cf. Ch'orti' 2004: 67, 75, 78, 80, 82, 94), unless 3SG.ABS –Ø is following (del Moral 1988: 400). The same it true for CHN, but only in the completive aspect (Knowles 1984: 78-80). In contrast, CHT seems to retain it, as <*Vcoloon*>, "nos salvo" (Morán 1685-95: 41) demonstrates. CHL (completive only) also keeps the status suffix (cf. Aulie and de Aulie 1978: 196, 197, 200, 201), but adds an epenthetic /y/ to avoid a vowel hiatus unless 3SG.ABS follows.

Idiom	Attestations		Sources
pCh	**-V ~ *-eʔ*	VER.TR.R [+INC]	(Kaufman and Norman 1984: tab. 11)
pCh	**-V ~ *-i*	VER.TR.R [+COM]	(Kaufman and Norman 1984: tab. 11)
pCh	**-V*	VER.TR.D	(Kaufman and Norman 1984: 145)
pCh	**-ä*	VER.TR.D < NOUN,POS,VER	(Kaufman and Norman 1984: 145)
pCh	**-i*	VER.TR.D < NOUN,POS,VER	(Kaufman and Norman 1984: 145)
pCh	**-tä*	VER.TR.D < NOUN	(Kaufman and Norman 1984: 144)
ECh	n/a		
CHT	*-a, -e, -i, -o, -u*	VER.TR THEM	(Fought 1984: tab. 3-3)
CHT	$-V_1$	VER.TR.R THEM	(Robertson, Law and Haertel 2010: 162)
CHT	*-V*	VER.TR.R [+INC,+COM]	(MacLeod 1987: fig. 1)
CHT	$-V_r$	VER.TR.R [+INC,+COM+SBJV]	(Sattler 2004: 371)
CHT	$-V_1$	VER.TR.R [+INC]	(Kaufman and Norman 1984: tab. 12)
CHT	$-V_1$	VER.TR.R [+COM]	(Kaufman and Norman 1984: tab. 12)
CHT	$-V_1$	VER.TR.R [+COM]	(Kaufman 1994, A 3a: 3)
CHT	$-V_1$	VER.TR.R [+SBJV]	(Kaufman 1994, A 3a: 6)
CHT	*-a, -e, -i, -o, -u*	VER.TR.D, non-CVC THEM	(Sattler 2004: 371-372)
CHT	*-a, -e, -i, -u*	VER.TR.D [+INC,+COM]	(MacLeod 1987: fig. 1)
CHT	*-V-Ø*	VER.TR.D [+INC]	(Kaufman and Norman 1984: 98)
CHT	*-V-(n)*	VER.TR.D, non-CVC [+INC]	(Sattler 2004: 371-372)
CHT	*-V-n*	VER.TR.D [+INC]	(Kaufman and Norman 1984: 98)
CHT	*-V-(n)*	VER.TR.D, non-CVC [+COM]	(Sattler 2004: 371-372)
CHT	*-V-n*	VER.TR.D, non-CVC [+SBJV]	(Sattler 2004: 371-372)
CHR	*-e / CeC ~ -i*	VER.TR THEM	(Wichmann 1999: 22, 25-31)
CHR	*-e / CeC ~ -i*	VER.TR.R [+INC,+COM]	(MacLeod 1987: fig. 1)
CHR	*-i ~ -e*	VER.TR.R [+IND]	(Dayley 1990: 371)
CHR	*-i ~ -e*	VER.TR.R [+INC]	(Kaufman and Norman 1984: tab. 12)
CHR	*-i ~ -e*	VER.TR.R [+COM]	(Kaufman and Norman 1984: tab. 12)
CHR	*-i*	VER.TR.R [+COM]	(Kaufman 1994, A 3a: 3)
CHR	*-i*	VER.TR.R THEM	(Oakley 1966: 244)
CHR	*-V*	VER THEM	(del Moral 1988: 400-401)[293]
CHR	*-a, -i/-e, -o, -u*	VER.TR.D THEM	(Wichmann 1999: 22, 25-31)

[292] There is an interesting split that Kaufman and Norman (1984: 100-101) already noted, in that CHN and CHR are closer to each other than the two members of each WCh / ECh branch respectively. But with each of the three scenarios developed by the authors, it seems implausible that CHR transitive verb inflection can be a reflex of CHT, thus we may add another argument to Wichmann's (2002a) cases.

[293] No differentiation between transitives and intransitives (see Table 46) is carried out, V is given as {a, i, o, u}. As general tendencies, *–a* is said to appear with (C)VCC roots, *–i* after (C)VC roots, for *–o* and *–u* no definite environments are made out.

CHR	*-a, -e, -o, -u*	VER.TR.D [+INC,+COM]	(MacLeod 1987: fig. 1)
CHR	*-V-Ø*	VER.TR.D THEM	(Kaufman and Norman 1984: 99)
CHR	*-V, Vn*	VER.TR.D	(Fought 1967: 178-179)
CHN	*-e*	VER.TR [+INC]	(Smailus 1975: 190, 196)
CHN	*-e’*	VER.TR [+INC]	(MacLeod 1987: fig. 20)
CHN	*-eʔ*	VER.TR.R [+INC]	(Kaufman and Norman 1984: tab. 12)
CHN	*-eʔ*	VER.TR.R [+INC]	(MacLeod 1987: fig. 11)
CHN	*-e’*	VER.TR.R [+INC]	(Keller and Luciano 1997: 448)
CHN	*-e?*	VER.TR.R [+IPVF]	(Knowles 1984: 72)
CHN	*-e’*	VER.TR [+COM]	(MacLeod 1987: fig. 20)
CHN	*-i*	VER.TR [+COM]	(Smailus 1975: 196)
CHN	*-i*	VER.TR.R [+COM]	(Kaufman and Norman 1984: tab. 12)
CHN	*-i*	VER.TR.R [+COM]	(Keller and Luciano 1997: 450)
CHN	*-i* /_-3.ABS	VER.TR.R [+COM]	(MacLeod 1987: fig. 11)
CHN	*-i* /_-3.ABS ~ -Ø	VER.TR.R [+PFV]	(Knowles 1984: 72)
CHN	*-e’*	VER.TR [+SBJV]	(MacLeod 1987: fig. 20)
CHN	*-e7*	VER.TR.R [+DEP]	(Kaufman 1994, A 3a: 6)
CHN	*-ʌ, -a, -i, -e, -u*	VER.TR.D	(MacLeod 1987: fig. 11)
CHN	*-Vn*	VER.TR.D [+INC]	(Knowles 1984: 88-95)
CHN	*-n*	VER.TR.D [+INC]	(Kaufman and Norman 1984: 97)
CHN	*-i*	VER.TR.D [+COM]	(Knowles 1984: 88-95)
CHN	*-i*	VER.TR.D [+COM]	(Kaufman and Norman 1984: 97)
CHL	*-Ø*	VER.TR.R [+INC]	(Dayley 1990: 373)
CHL	*-Ø*	VER.TR.R [+INC]	(Kaufman and Norman 1984: tab. 12)
CHL	*-Ø*	VER.TR [+INC] /CVC	(Vázquez Alvarez 2002: 48, 53)
CHL	*-Ø*	VER.TR.R (unmarked)	(Attinasi 1973: 214-217, tab. 22)
CHL	*-Ø ~ -e(ʔ)*	VER.TR.R [+INC]	(MacLeod 1987: fig. 11)
CHL	-V_1	VER.TR.R [+COM]	(Kaufman and Norman 1984: tab. 12)
CHL	-V_1	VER.TR.R [+COM]	(Kaufman 1994, A 3a: 3)
CHL	-V_1	VER.TR /CVC	(Warkentin and Scott 1980: 34-35)
CHL	-V_1	VER.TR.R [+INC,+COM]	(Schumann Gálvez 1973: 27)
CHL	-V_1-*y*	VER.TR [+COM] /CVC	(Vázquez Alvarez 2002: 49, 53)
CHL	-V_1*(y)*	VER.TR.R [+COM]	(Dayley 1990: 373)
CHL	*-ʌ*, -V_1	VER.TR.R [+PST]	(Attinasi 1973: 214-217, tab. 22)
CHL	*-ʌ /CaC ~ -V*	VER.TR.R [+COM]	(MacLeod 1987: fig. 11)
CHL	*-e*	VER.TR [+PST,+COM]	(Schumann Gálvez 1973: 26)
CHL	*-ö*	VER.TR [+PST,+COM]	(Schumann Gálvez 1973: 26)
CHL	*-Ø < -e(7)*	VER.TR.R [+DEP]	(Kaufman 1994, A 3a: 6)
CHL	*-a, -e, -i, -o, -u*	VER.TR.D	(MacLeod 1987: fig. 12)
CHL	*-Vn*	VER.TR.D, non-CVC [+INC]	(Warkentin and Scott 1980: 44)
CHL	*-an ~ -en ~ in*	VER.TR.D [+INC]	(Attinasi 1973: 217)
CHL	*-n*	VER.TR.D [+INC]	(Kaufman and Norman 1984: 96)
CHL	*-V*	VER.TR.D, non-CVC [+COM]	(Warkentin and Scott 1980: 44)
CHL	*-ʌ ~ -e, -ʌ ~ -i*	VER.TR.D [+COM]	(Attinasi 1973: 217)
CHL	*-Ø*	VER.TR.D [+COM]	(Kaufman and Norman 1984: 96)
CHL	*-a*	VER.TR.D < NOUN	(Kaufman 1994, A 9: 52)
CHL	*-i*	VER.TR.D < NOUN	(Kaufman 1994, A 9: 53)
CHL	*-ta*	VER.TR.D < NOUN	(Kaufman 1994, A 9: 54)

Table 36: Ch’olan forms for the root transitive marker.

The Yukatekan suffixes (Table 37) for the incompletive and completive are overall innovations and not cognate to pM (Kaufman 1994, A 3a: 3), except the dependent status which finds its reflex in the pYu future/optative suffix **–e7* (Mora-Marín 2001: tab. 2.21). With virtually no variation, we find incompletive *–ik* and completive *–aj* in all Yukatekan languages, while (morpho)phonemic processes (e.g. syncopation or [h] > [Ø]) may occur. For the dependent status, we find *–e(j)* in all languages which exists along –V_1’ in ITZ and MOP. Only Colonial YUK has –V_1b. Also refer to Bohnemeyer’s

(2004) case study for YUK aspect/mood markers and corresponding status suffixes. The above suffixes appear also appear after any derivational suffix, e.g. the *–t* 'factive' (Smailus 1989: 48-49).

According to Kaufman's data (Mora-Marín 2001: 54), Yu *–ik* < pM **–ik* is a root transitive nominaliser, thus the incompletive marking of YUK transitives might originate from a similar mechanism as intransitive positionals (see footnote 169). Completive *–aj* originates from a pM enclitic **=aj*, "earlier".

Idiom	Attestations		Sources
ITZ	*k-…-ik*	VER.TR [+INC]	(Hofling and Tesucún 2000: 45)
ITZ	*-ik*	VER.TR [+INC]	(Hofling 1991: 29-30)
ITZ	*-ik*	VER.TR [+INC]	(MacLeod 1987: fig. 35)
ITZ	*-ik*	VER.TR [+INC]	(Itza' 2001: 94-97)
ITZ	*-ic*	VER.TR [+INC]	(Schumann Gálvez 1971: 44)
ITZ	*t-…-aj*	VER.TR [+COM]	(Hofling and Tesucún 2000: 50)
ITZ	*-ah*	VER.TR [+COM]	(Hofling 1991: 30)
ITZ	*-ah*	VER.TR [+COM]	(MacLeod 1987: fig. 35)
ITZ	*-aj*	VER.TR [+COM]	(Schumann Gálvez 1971: 43)
ITZ	*-aj*	VER.TR [+COM]	(Itza' 2001: 97)
ITZ	*ka' …-V'*	VER.TR [+DEP]	(Hofling and Tesucún 2000: 50)
ITZ	*-V' ~ -ʌ'*	VER.TR [+FUT,+SBJV]	(MacLeod 1987: fig. 35)
ITZ	*-V', -ej, -Ø*	VER.TR [+DEP]	(Hofling 1998: tab. 1)
ITZ	*-äk*	VER.TR [+POT]	(Itza' 2001: 97)
MOP	*-ik*	VER.TR [+INC]	(Schumann Gálvez 1997: 123)
MOP	*-ik*	VER.TR [+INC]	(MacLeod 1987: fig. 35)
MOP	*-ik*	VER.TR [+INC]	(Kaufman 1994, A 3a: 3)
MOP	*-ik*	VER.TR [+INC]	(Mopan 2001: 155-180)
MOP	*-ik*	VER.TR [+INC]	(Hofling 2011: 13)
MOP	*-ic*	VER.TR [+INC]	(Ulrich and Ulrich 1966: 262)
MOP	*-aj*	VER.TR [+COM]	(Schumann Gálvez 1997: 123, 132)
MOP	*-aj*	VER.TR [+COM]	(Kaufman 1994, A 3a: 3)
MOP	*-aj*	VER.TR [+COM]	(Mopan 2001: 194-199)
MOP	*-aj*	VER.TR [+COM]	(Ulrich and Ulrich 1966: 262)
MOP	*-aj*	VER.TR [+COM]	(Hofling 2011: 13)
MOP	*-ah*	VER.TR [+COM]	(MacLeod 1987: fig. 35)
MOP	*-V'*	VER.TR [+SBJV]	(Schumann Gálvez 1997: 143)
MOP	*-V' ~ -ʌ'*	VER.TR [+FUT,+SBJV]	(MacLeod 1987: fig. 35)
MOP	*-V', -e /_#*	VER.TR [+FUT]	(Mopan 2001: 181-193)
MOP	*-V' /_#*	VER.TR [+DEP]	(Hofling 2011: 13)
MOP	*-V7*	VER.TR [+DEP]	(Kaufman 1994, A 3a: 6)
LAK	*-ik*	VER.TR [+INC]	(Bruce 1968: 60, 62)
LAK	*-ik*	VER.TR [+INC]	(MacLeod 1987: fig. 25)
LAK	*-ik*	VER.TR [+INC]	(Kováč 2012: 2)
LAK	*-a(h)*	VER.TR [+COM]	(Bruce 1968: 60, 62)
LAK	*-a(h)*	VER.TR [+COM]	(MacLeod 1987: fig. 25)
LAK	*-a(h)*	VER.TR [+COM]	(Kováč 2012: 2, 3)
LAK	*-e(h)*	VER.TR [+FUT,+IMP]	(Bruce 1968: 60, 62)
LAK	*-e(h)*	VER.TR [+SBJV]	(MacLeod 1987: fig. 25)
YUK	*-Ø*	VER.TR [+INC]	(Smailus 1989: 44-45)
YUK	*-(i)k*	VER.TR [+INC]	(McQuown 1967: 235)
YUK	*-ik*	VER.TR [+INC]	(Tozzer 1921: 56)
YUK	*-ic*	VER.TR [+INC]	(MacLeod 1987: fig. 45)
YUK	*-ik*	VER.TR [+INC]	(MacLeod 1987: fig. 25)
YUK	*-ik*	VER.TR [+INC]	(Kaufman 1994, A 3a: 3)
YUK	*-ik*	VER.TR [+INC]	(Dayley 1990: 376)
YUK	*-ik*	VER.TR [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 330)
YUK	*-(a)x*	VER.TR [+COM]	(McQuown 1967: 235)
YUK	*-ah*	VER.TR [+COM]	(Smailus 1989: 44-45)

YUK	*-ah*	VER.TR [+COM	(Tozzer 1921: 56)
YUK	*-ah*	VER.TR [+COM]	(MacLeod 1987: fig. 45)
YUK	*-aj*	VER.TR [+COM]	(MacLeod 1987: fig. 25)
YUK	*-aj*	VER.TR [+COM]	(Kaufman 1994, A 3a: 3)
YUK	*-aj*	VER.TR [+COM]	(Dayley 1990: 376)
YUK	*-ah*	VER.TR [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 330)
YUK	*-Vb, -e, -Ø*	VER.TR [+SBJV]	(McQuown 1967: 236, 237)[294]
YUK	*-V'b*	VER.TR [+SBJV]	(Smailus 1989: 44-45)
YUK	*-Vb'*	VER.TR [+SBJV]	(MacLeod 1987: fig. 45)
YUK	*-eh*	VER.TR [+SBJV]	(MacLeod 1987: fig. 25)
YUK	*-eh*	VER.TR [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 330)
YUK	*-e*	VER.TR [+DEP]	(Kaufman 1994, A 3a: 6)

Table 37: Yukatekan forms for the root transitive marker.

Tzeltalan (Table 38) has undergone a unique innovation within the WM branch, as it completely omits status suffixes in the plain status, and verbs are not distinguished for tense / aspect other than by preposed aspect markers. Only the dependent status is specifically marked (also among intransitives) with *–uk*.

The Tzeltalan languages also feature reflexes of the pM transitivisers from nouns (Kaufman 1994, A 9: 52-54). The **–V* verbalisers follow a *–Vn* pattern, while **–ta* is reflected as *–ta(y)*. These stem formatives usually directly follow the root.

Idiom	Attestations		Sources
pTz	**-Ø*	VER.TR [+PLAIN]	(Kaufman 1972: 150)
pTz	**-uk*	VER.TR [+SBJV]	(Kaufman 1972: 148)
pTz	**-in*	VER.TR.D < NOUN	(Kaufman 1972: 141)
pTz	**-an*	VER.TR.D < NOUN	(Kaufman 1972: 141)[295]
pTz	**-tay*	VER.TR.D < NOUN,VER	(Kaufman 1972: 142)
TZE	*-Ø*	VER.TR [+PLAIN]	(Ara 1986: f. 129v)[296]
TZE	*-Ø*	VER.TR [+IND]	(Kaufman 1971: 103)
TZE	*-Ø*	VER.TR.R [+PLAIN]	(Kaufman 1994, A 3a: 3)
TZE	*-Ø*	VER.TR [+IND]	(Dayley 1990: 369)
TZE	*-uk*	VER.TR [+SBJV]	(Kaufman 1971: 103)
TZE	*-uk*	VER.TR [+SBJV]	(Slocum 1948: 85)
TZE	*-{a,i,u}n*	VER.TR.D < NOUN,VER	(Slocum 1948: 82)
TZE	*-an*	VER.TR.D < VER	(Kaufman 1971: 49)
TZE	*-in ~ -an ~ -n*	VER.TR.D < NOUN	(Kaufman 1971: 50)
TZE	*-tay*	VER.TR.D < NOUN,ADJ,VER	(Slocum 1948: 82)
TZE	*-(V)taY*	VER.TR.D < NOUN,VER	(Kaufman 1971: 63)
TZE	*-tay*	VER.TR.D < NOUN,VER	(Radhakrishnan 1970: 410)
TZO	*-Ø*	VER.TR [+IND]	(Schuller 1925: 201)
TZO	*-Ø*	VER.TR [+IND]	(Cowan and Merrifield 1968: 288)
TZO	*-Ø*	VER.TR.R [+PLAIN]	(Kaufman 1994, A 3a: 3)
TZO	*-Ø*	VER.TR [+IND]	(Dayley 1990: 367)
TZO	*-to*	VER.TR [+FUT]	(Schuller 1925: 202)
TZO	*-uk*	VER.TR [+SBJV]	(Schuller 1925: 203)
TZO	*-in*	VER.TR.D < NOUN	(García de León 1971: 25)

[294] Comparing these data to Smailus (1989), it is apparent that the subjunctive on *–e* is reserved to bisyllabic transitives and those derived by the 'factive' *–t* (Smailus 1989: 40, 46, 48), while *–Ø* follows causatives (Smailus 1989: 40, 42).

[295] These suffixes also follow the pTz positional verbalisers **–p'*, **–tz'*, **–ch'* and **–k'* (see Table 48) to form causative (or portative) verbs (cf. Kaufman 1972: 141).

[296] Concluded by contextual evidence, Ara provides <Exemplum activorum est *uquich avuum*, reciví de ti […].>"

TZO	*-an*	VER.TR.D < VER	(García de León 1971: 25)
TZO	*-ta, -tas*	VER.TR.D < NOUN	(Kaufman 1994, A 9: 54)

Table 38: Tzeltalan forms for the root transitive marker.

The members of the Greater Q'anjobalan branch (Table 39) feature a quite uniform appearance for the status marker in the plain (incompletive / completive) status, while only CHJ, TOJ and POP show slight deviations. Generally, the suffix vowel is /a/ in case the root vowel is {/a, i, e/}, otherwise it is root-harmonic, unless the root is of non-CVC form. In all languages except TOJ, we have *–a' ~ –V_1'* with the allomorphs *–ah ~ –V_1h* in CHJ and *–a ~ –V_1* in POP. The (facultative) elision of the status suffix is described in CHJ, QAN, AKA and POP in case other morphemes follow.

TOJ in contrast shows a very close reflex of pWM **–(a-)w ~ *–a(w)* (Kaufman 1994, A 3a: 12, Mora-Marín 2001: tab. 2.22) with *–a(w) ~ –V_1(w)*. The suffix vowel is conditioned by the same root vowel patterns as in the other languages. The status suffix is retained in case other morphemes follow, but the final /w/ only appears in these cases as an epenthesis to avoid a vowel hiatus. It is in compliance with the pM **–o-w* / … allomorph. For pM ** –o-h* / __#, which has not been pursued further in any reconstruction, we may also find a direct reflex in CHJ, but also in the other languages (also in TOJ) with a [h] > [ʔ] > [Ø] shift. Thus, a morphological alternant has been lost in all languages except TOJ, therefore these languages have *–V('/h) > –Ø* / … as an innovation[297].

The Greater Q'anjobalan evidence is also strong evidence that the shift from a single vowel status suffix, namely pM **–o(-w/h)* > pWM **–a(w/h)*, to a root harmonic vowel took place still in pWM, before it split into pGT and pGQ.

For the derivation of transitive roots from nouns, the pM suffixes **–a*, **–i* and **–ta* show reflexes only in some languages of the branch. In this connection, TOJ retains the most of them.

Idiom	Attestations		Sources
CHJ	*-ʔVh ~ -hVʔ /_#*	VER.TR.R [+PLAIN] /CVC	(Hopkins 1967a: 65-66, 73)[298]
CHJ	*-a7 /_#*	VER.TR.R [+PLAIN]	(Kaufman 1994, A 3a: 3)
CHJ	*-a' /_#*	VER.TR.R [+IND]	(Dayley 1990: 363)
CHJ	*-a' ~ -o' ~ -u'*	VER.TR.R [+IND]	(García Pablo and Domingo Pascual 2007: 130, 131)
CHJ	*-a' ~ -a ~ -o, -Ø*	VER.TR.R [+IND]	(Buenrostro Díaz 2009: 45, 98, 129-136, 141-142)[299]
CHJ	*-a' /_#*	VER.TR.R [+INC]	(Domingo Pascual 2007: 169, 173)
CHJ	*-a /_#*	VER.TR.R [+COM]	(Domingo Pascual 2007: 169, 174)
CHJ	*-a7 /_#*	VER.TR.R [+DEP]	(Kaufman 1994, A 3a: 6)

[297] Although the data are scarce, MCH seems to occupy a position in between with at least *–V' > –V* / __C (see footnote 309).

[298] Hopkins describes this form as a "transitive verb phrase clitic" to occur in initial post-root position when no other suffix (except *–Ø*) is realised. The vowel is generally root-harmonic, but V > [a] / C{a,e,i}C and thus follows other GQa vocalisations of the root transitive thematic.

[299] While most grammars and compilations describe a transitive thematic / __#, the data in context are more diverse. Firstly, we have *–a' ~ –a* with CaC and some other roots, e.g. *ix-i-Øn-il-a*, "me viste" with *ix-i-Øl-a'*, "vi a el" (Buenrostro Díaz 2009: 136, 207) and *–o* with CoC roots. Secondly, the rule *–V* / __# and *–Ø* / … is apparently not consequently exercised, raising the question how a juncture is defined apart from being phrase-final. Compare for example *to ix-Ø-Ø-al-a to ol-Ø-Ø-ak' jun in-mansan* 'COM-3SG.ABS-2SG.ERG-decir-THEM CONJ FUT-3SG.ABS-2SG.ERG-dar uno 1SG.ERG-manzana', "[m]e prometiste una manzana" with two transitive verbs, the first with a thematic, the second without. The same observation is also true for *–i* as the thematic of intransitive verbs (see footnote 381).

CHJ	*-ex /_#*	VER.TR.R [+PLAIN] /non-CVC	(Hopkins 1967a: 65-66, 86)[300]
CHJ	*-tej ~ -ej ~ jej*	VER.TR.D < NOUN	(García Pablo and Domingo Pascual 2007: 117)
TOJ	*-a(w) /C{a,i,e}C*	VER.TR (independent) /CVC	(Supple and Douglass 1949: 173)[301]
TOJ	*-o(w) /CoC*	VER.TR (independent) /CVC	(Supple and Douglass 1949: 173)
TOJ	*-u(w) /CuC*	VER.TR (independent) /CVC	(Supple and Douglass 1949: 173)
TOJ	*-V(w)*	VER.TR.R	(Furbee-Losee 1976: 131-132)
TOJ	*-a(w/y)*	VER.TR /CVC,CVCC	(Lenkersdorf 2002: 129-130)
TOJ	*-u(w) ~ -o(w)*	VER.TR /CVC	(Lenkersdorf 2002: 131)
TOJ	*-a(w)*	VER.TR.R [+PLAIN]	(Kaufman 1994, A 3a: 3)
TOJ	*-a ~ -o*	VER.TR.R [+IND]	(Dayley 1990: 364)
TOJ	$-ah_2$, $-ay_1$, $-iy_1$	VER.TR.R	(Furbee-Losee 1976: 132-133)[302]
TOJ	*-e7*	VER.TR.R [+DEP]	(Kaufman 1994, A 3a: 6)
TOJ	*-uk ~ -ik*	VER.TR [+POT]	(Supple and Douglass 1949: 173)
TOJ	*-a(y)*	VER.TR.D < ADJ,VER	(Supple and Douglass 1949: 171)
TOJ	*-ta(y) ~ -t*	VER.TR.D < NOUN	(Supple and Douglass 1949: 171)
TOJ	*-t*	VER.TR.D < NOUN,POS,VER	(Furbee-Losee 1976: 70)
QAN	*-V7*	VER.TR [+IND]	(Martin 1977: 130)
QAN	*-V' /C{a,o,u}C#*	VER.TR.R [+PLAIN]	(Q'anjob'al 2005: 114)
QAN	*-V' /C{a,o,u}C#*	VER.TR.R [+PLAIN]	(Mateo Pedro 2009: 49-50)
QAN	$-a'_1$ */C{i,e}C#*	VER.TR.R [+PLAIN]	(Q'anjob'al 2005: 114)
QAN	$-a'_1$ */C{i,e}C#*	VER.TR.R [+PLAIN]	(Mateo Pedro 2009: 49-50)
QAN	*-V' /_#*	VER.TR.R [+PLAIN]	(Mateo Toledo 2008: 55)
QAN	*-V'*	VER.TR.R [+DEP]	(Mateo Pedro 2010: tab. 2.9)
QAN	*-oj*	VER.TR.R [+DEP,+INF]	(Mateo Toledo 2008: 57, 86-87)[303]
AKA	*-Ø*	VER.TR.R THEM	(Zavala Maldonado 1992a: 68)[304]
AKA	*-Ø, -a', -e', -o'*	VER.TR.R THEM	(Akateka 2007: 190-196)
AKA	*-a' /C{a,i}C*	VER.TR.R [+INC,+COM]	(Méndez Martinez 2004: 81, 103-105, 113-117)[305]
AKA	*-aʔ /C{a,i}C*	VER.TR.R THEM	(Zavala Maldonado 1992a: 70)

[300] This morpheme is usually the derived transitive marker, as it is also given as *–j* < pM **–h* (Kaufman 1994, A 3a: 3). However, a few root transitives may take this suffix (Hopkins 1967a: 73, 86), and all examples appear to be of VC shape, e.g. *k-ʔúk'-ex*, "we drink (it)" (Hopkins 1967a: 65).

[301] The suffix appears both in the incompletive and completive aspect. The /w/ is only expressed when vowel initial morphemes are to follow, e.g. the ABS pronoun, compare *ʔaw-il-a*, "you saw it" with *s-tup-uw-on*, "he paid me" (Supple and Douglass 1949: 173). The use of this marker is conditioned by the absence of an auxiliary and that the verb is not marked in the perfective aspect (Table 64). When the basis of monosyllabic CVCC or disyllabic shape and the following suffix is vowel initial, the suffix is *–a(y)* instead, without any reflex to the root vowel, e.g. *kolt-a*, "ayudar" (Lenkersdorf 2002: 129-130).

[302] Furbee-Losee reports only very few transitive roots to be inflected with these markers, all of them are glottal-initial and irregular. The same morphophonemic rules as with *–V(w)* apply for the final consonant of these three suffixes .

[303] Although *–oj* is described as the transitive counterpart to *–oq*, a few more observations need to be made. The suffix intransitivises the transitive verb and incorporates the object. The transitive root suffixed in such a way lacks all inflection. It follows the proper verbal predicate whose agent controls the infinitive in a complement clause. Also see footnote 476 for POP *–Vj* infinitives, best understood as nominal forms. Other Mayan languages (e.g. CHL, see footnote 455) also understand infinitives as verbal nouns, thus the assertion that *–oj* marks an intransitivised verb (Mateo Toledo 2008: 87) should be reviewed again in an comparative approach.

[304] Compare to the examples *č-Ø-aw-al* 'INC-3SG.ABS-2SG.ERG-decir', translated as "[t]ú le avisas" and *Ø-y-ʔal-aʔ* '3SG.ABS-3SG.ERG-decir-IND', translated as "[f]ue lo que dijo". Furthermore, Zavala Maldonado (1992b: 64) explicates that CV(ʔ) verbs also frequently drop the thematic suffix, possibly this tendency can be enhanced for all non-CVC forms. We have also indications (Zavala Maldonado 1992a: 69) that the status marker can as well be elided when enclitics are following, e.g. *ş̌-Ø-w-ʔal=kan* 'COM-3SG.ABS-1SG.ERG-decir=quedar', "ya le dije", although this is not necessarily the case (Zavala Maldonado 1992a: 72): *Ø-y-ʔal-aʔ=la* '3SG.ABS-3SG.ERG-decir-IND-ADM', "[é]l [le] avisa(r)". In any case, the thematic is elided and replaced by the enclitic *–an* with 1SG.ERG and the plural *–eb'* with 3PL.ERG (Méndez Martinez 2004: 73, 103-105, 113-117). The patterns of the vocalisations of the thematic suffix base on these additional examples: *c-Ø-aw-ʔil-aʔ* 'INC-3SG.ABS-2SG.ERG-ver-IND' (Zavala Maldonado 1992a: 97) and *č-Ø-a-ç̥on-oʔ* 'INC-3SG.ABS-2SG.ERG-vender-IND'. The described patterns are also in accordance with TOJ, POP and QAN.

[305] The reason that *–a'* is also used for CiC stems while the thematic suffix is otherwise generally vowel harmonic is because that *–i* is reserved as the fixed vowel thematic of intransitives (see Table 49). There are only few exceptions with *–e'* (Méndez Martinez 2004: 117, Zavala Maldonado 1992b: 64), e.g. *uk'*, "tomar".

AKA	*-a(?) /C{a,i}C*	VER.TR.R THEM	(Zavala Maldonado 1992b: 52)
AKA	*-V_1(?) /C{o,u}C*	VER.TR.R THEM	(Zavala Maldonado 1992b: 52, 64)
AKA	*-V' /C{e,o,u}C*	VER.TR.R [+INC,+COM]	(Méndez Martinez 2004: 81, 103-105, 113-117)
AKA	*-oʔ /CoC*	VER.TR.R THEM	(Zavala Maldonado 1992a: 121)
POP	*-V /C{a,o,u}C#*	VER.TR.R [+PLAIN]	(Day 1973: 28-29)[306]
POP	*-a /C{i,e}C#*	VER.TR.R [+PLAIN]	(Day 1973: 28-29)
POP	*-a, -e, -o, -u*	VER.TR.R [+PLAIN]	(Popti' 2001: 154-155)
POP	*-a, -o, -e*	VER.TR.R [+PLAIN]	(Craig 1977: 90-91)[307]
POP	*-a, -o, -u*	VER.TR.R [+PLAIN]	(Delgado Rojas et al. 2007: 131-133)
POP	*-a /_#*	VER.TR.R [+PLAIN]	(Kaufman 1994, A 3a: 3)
POP	*-a /_#*	VER.TR.R [+IND]	(Dayley 1990: 365)
POP	*-a', -e', -o', -u'*	VER.TR.R [+POT]	(Popti' 2001: 154-155)
POP	*-a' ~ -o' ~ -u'*	VER.TR.R [+IRR]	(Dayley 1990: 365)
POP	*-V', -b /_#*	VER.TR.R [+IRR]	(Craig 1977: 287)
POP	*-te*	VER.TR.D < NOUN	(Stratmeyer et al. 1966: 213)
POP	*-te*	VER.TR.D < NOUN	(Day 1973: 44)
POP	*-te ~ -nhe*	CAUS < NOUN	(Popti' 2001: 116)
POP	*-te ~ -e*	VER.TR.D < NOUN,ADJ,VER	(Ross Montejo and Delgado Rojas 2007: 57-58)
MCH	*-V'*	VER.TR THEM	(Martin 1990: 423)[308]
MCH	*-u*	VER.TR.R [+IND]	(Dayley 1990: 367)[309]
MCH	*-a ~ -o /CoC*	VER.TR.R [+IND]	(Palosaari 2011: 125)

Table 39: Greater Q'anjobalan forms for the root transitive marker.

The data from Greater Q'anjobalan provide a valuable calibration for the historical configuration of ClM and the vocalisation of its transitive markers, especially with CVC roots. For these, it was first proposed to be *–V_1w* by Bricker (1986: 126-132), who correlated the hieroglyphic evidence with the almost constant indication by the syllabogram **wa** with the TOJ linguistic data[310]. The vowel harmony was also supported by Wald (2007: 219-221) based on syllabic spellings, as well as CHL and CHT patterns.

However, as ClM is closely related to pCh, we encounter a dilemma: The reconstruction of pCh **–V_1* does not fit the ClM *–V_1w* proposal based on epigraphic data. There are several ways of solving the problem. We can certainly follow Wald (2007: 219-220) that the use of =**wa** in root transitive spellings was not just to spell ***–aw* as a reflex or a fossilised form[311] of an earlier stage, namely the pWM

[306] The suffix also disappears on junctures when other words are following. Compare *x-a-Ø-b'ik'-a* 'COM-2SG.ERG-3SG.ABS-swallow-IND', "you swallowed sth." with *x-a-Ø-b'ik' ewi* 'COM-2SG.ERG-3SG.ABS-swallow ADV', "you swallowed sth. yesterday".

[307] There are cases, where the marker is retained although other constituents follow: (1) verbs ending in CC, (2) derived transitives in *–e* and (3) some CVC intransitives. The loss of the thematic is therefore also true for these.

[308] Although it is said that the thematic suffix is vowel-harmonic, and most of the examples stick to the pattern, some forms provided by Martin exhibit alterations, e.g. *aab'-i'*, "oir" or *ut-a'*, "hacer" (Martin 1990: 425, 426). It also appears that *–V'* > *–V* / __C, e.g. *k-aa-poch'-o-qin*, "me querés matar" (Martin 1990: 423).

[309] Transitives with an *–u* thematic are supposed to "encompass actions done with implements or body parts" (Palosaari 2011: 125).

[310] MacLeod (1984: 246) previously has taken such spellings as evidence for the ECh passive on *–w*, which would rather require the sign sequence =**wa**=**ja** / __# (see Table 10).

[311] I do not follow Wald's (2007: 219-220) approach to transcribe *–V_1'w* for ClM, as I see no linguistic evidence from either Ch'olan or TOJ to assume a glottalised vowel. I also miss an explanation why to transcribe for example as *u-tzak-a'w* or *u-chok-o'w*. It seems likely that these analyses originate from disharmony rules, mainly per Harmony Rule 3b by Lacadena and Wichmann (2004: 111) applicable for V_r = {/e, u, o/} (e.g. **u=cho-ko=wa** < *u-chok-o'w*, DPL St. 8, I5) and transposed for consistency with V_r = /i/ (Harmony Rule 2b *i-a* > /i'/) and V_r = /a/ (Harmony Rule 1 *a-a* > /a/). The root transitive marker in my opinion is therefore a good showcase to invalidate the applicability of harmony rules also at morphemic boundaries where full integrative syllabic

* –*a(w)*. This is even more true when applying the pGT reconstruction as either *–*a* or *–*V* (see above). While this stage is temporarily closer to pCh, it still lacks the final /w/ in all reconstructions.

Assuming that ClM might have retained /w/ as a reflex (Wald 2007: 219), the immediate implication is that either the linguistic reconstruction is wrong or ClM was disconnected from the historical development of pCh. The other showcases have already evidenced a good correlation between the epigraphic data and the pCh reconstructions. As it is unlikely that ClM went a separate path with such central feature, a refinement for ClM is necessary and a combination with linguistic data is possible.

As it was already suggested by several authors (Mora-Marín 2001: 74, 87, Wald 2007: 223-225), the ClM suffix was just $-V_1$ / __# and, as in TOJ, $-V_1w$ / … was used otherwise. This does not falsify any reconstruction for either pGT or pCh, but we would simply need to add *$-V_1w$ / … as an allomorph to the scheme. Such an argument is still hard to justify, as no epigraphic example, i.e. showing an absolutive pronoun other than –Ø, has yet been distilled from the corpus.

When accepting the historical development of Greater Q'anjobalan (see above) as a reflex of pWM, one might still accept *–*a(w)* > *$-V_1(w)$ for pGT and thus *$-V_1(w)$ for pre-pCh[312]. Only later, pCh developed * $-V_1$ < *$-V_1(w)$, assuming that the loss of /w/ is not a pGT, but a later pCh innovation. Hence, we can accept $-V_1(w)$ in early ClM, while at an undefined later point of time it dropped /w/ as well (with the effect that $-V_1$ is elided when suffixes follow), either regularly reflecting the general pCh development or occasionally because of vernacular influences[313]. This might be an explanation by historical linguistics for the almost constant use of **CV$_1$=wa** / __# to synharmonically indicate the root transitive marker in a pGT stage writing system[314], it served as a visual marker (cf. Tokovinine and

(= phonemic) spellings (as per spelling group 1) of the stem and an invariable or predictable syllabogram for the suffix interact. With a strict application of the rules, varying qualities of the suffix vowel for allomorphs would result, and disharmonic spellings like **u=je-le=wa** (PAL TFC, E6) that stick to the rule (with *u-jel-eew* as per Robertson, Houston, Zender and Stuart [Robertson et al. 2007: 10]) are literally absent (also see footnote 94). As with other cases (e.g. alternations among passive spellings), I support the idea of a visual reading aid by the use of a constant syllabogram (see Chapter 2.5.3.2). The problem described was one of the reasons for Houston, Robertson and Stuart to propose morphosyllables, as they are supposed to suspend disharmony (2001b: 15, fn. 4). Of course, disharmony is not suspended in writing, but only the inferred 'rules' thought to be represented by it.

312 This at the same time implies the parallel development for the pM *–*o-h* / __# > pWM *–*a-h* > pGT *$-V_1$-*h* > pre-pCh *$-V_1$ (hence [h] > [Ø]).

313 A similar discussion on the morphophonemics of a suffix concerns the ClM passive thematic –*aj* (see Chapter 3.1.1.1) whose final /j/ is reconstructed and attested by spellings, but otherwise it may have been *–*a* / __C or possibly later even *–*a* / __# (see footnote 163), reflecting the development of the pCh daughter languages. While following the general development in the Ch'olan branch, the spelling applied was still using the **=ja** sign. We know the phonological fossilisation of forms and their reflection in writing. While ClM has only received very little attention in this respect, a classical paradigm of this phenomenon is the continued use of Middle Egyptian beyond the Middle Kingdom / Second Intermediate Period (Baines 1983: 581).

314 Mora-Marín (2005a) proposed that the Kaminaljuyu script represents a Ch'olan precursor and was a donor of later Lowland Maya writing. When following this view, we might offer the hypothesis (despite the lack of epigraphic evidence) that a spelling convention with **=wa** developed there and was thus retained in ClM. This pre-pCh (Mora-Marín's Ch'olan[-Tzeltalan] = pGT) would also fit the Late Pre-Classic time horizon of Kaminaljuyu (cf. Mora-Marín 2005a: 64). The first occurrence of **=wa** in Maya writing does not really help to calibrate the linguistic with the epigraphic data. Grube (1990a: 53, 93) dates it to 8.17.17.0.0 (393 AD) on BJC St. 2, C5, but this is a spelling **ka-se-wa** for the month *Sek*. Other examples are earlier, but also part of a lexeme and not securely datable (e.g. **^{2}ka-wa** on COL Conch Shell Trumpet, A2 [Grube and Martin 2001, II: 35]) or originate from outside the lowlands (e.g. **AJAW^{wa}** on ABJ St. 5, C1 dating to 8.4.5.17.11 = 126 AD [Fahsen 2010: 1007-

Davletshin 2001)[315]. I concur with Wald (2007: 925) to not consider the pCh *–*eʔ* [+INC] and *–*i* [+COM] status markers alternatively proposed by Kaufman and Norman (1984: tab. 11) any more for ClM, unless in a vernacular context.

From a graphematic point of view, the use of **CV$_1$=wa / __#** < –*V$_1$* spellings has two implications which are not necessarily contradictive. Firstly, it points out the potential of the spelling to use the glide when morphophonemically conditioned[316]. We can hypothesise a spelling change to ***CV$_1$=wV**

1008, Graham, Heizer and Shook 1978: 92, pl. 5]), although the latter is debatable for palaeographic reasons (Lacadena 2010a: 1052, Mora-Marín 2010b: 1043). As a root transitive marker, the earliest contemporary examples are probably **u=JOY=wa** on COL JM Plaque 4442, A5 (with 4 *K'an* 17 *Yax* in A9-A10 and 3CF in A2, leaving 8.11.13.11.4 as the likely date) and **u=TZAK=wa** on ENC St. 1 (likely dating to 8.13 as a re-located pre-*entrada* monument from Tikal [Martin 2000: 58-59]). The marking by **wa** thus post-dates the calculated emergence of pCh at around 100 AD (see Figure 4). However, one needs to consider that syllabograms to provide grammatical affixes are still scarce in early texts, although we can observe their emergence as early as on COL DO Celt (presumably dating to 8.4.0.0.0 = 120 AD [Schele and Miller 1986: 82-83, pl. 22]).

[315] We have exceptions applying other **wV** signs, e.g. **u=K'AL=wi TUN^{ni}** < *u-k'al-[a]-Ø tun* (CRC St. 13, A16) or **u=CHOK=wi CH'AJ?** < *u-chok-[o]-Ø ch'aj* (NAR Alt. 1, K9), if they were not nominalised antipassives, see below Chapter 3.1.3.2. True indicators of vernaculars totally omitting any **wV** sign are spellings like **u=CHOK^{ko} ch'a-ji** < *u-chok-o-Ø ch'aj* (CPN T. 22 Stone, E4) where the root transitive marker is represented by the phonemic complement. A ***CVC(-CV)=V** spelling seems unlikely, as it rather would imply ***CVC-'V* (see footnotes 31 for glottal onset elision and 290 for other –*V* suffixes). The spelling from Copan may thus represent a CHT vernacular (Wald 2007: 223-225). Forms like **u=CV-Ce/Ci** might also very well reflect CHR or CHN traits without signalling a nominal form or even suggest some complex root vowel because of a potential disharmonic spelling. One ambiguous example is **u=hi-li OK** < *u-hil-i-Ø ok* on TRT Mon. 8, which may equally represent the CHN –*i* [+COM] suffix. Even more interesting are spellings omitting any additional syllabic sign behind a morphographically realised root, as e.g. **u=CHOK ch'a-ji** < *u-chok-Ø+ch'aj-Ø* (AGT St. 5, C3). These have been interpreted as nominal compounds (Wald 2007: 225-230) and can be considered as Ch'olan incorporating 'antipassives' (see Chapter 3.1.3.2) or nominalisations by –*Ø* (see footnote 357). While this holds true for cases as in Aguateca (reflecting a Ch'olan morphology), the cases of TNA Mons. 7, G1 and 104, G1 provide interesting perspectives. They have been taken as **u=CHOK=ji** < *u-chok-[o]j-Ø* by Lacadena and Wichmann (2005a: 36) to represent the Tzeltalan perfect suffix –*oj* (see Table 63). However, a –*V$_1$j* ~ –*Vj* perfect is also known from ClM, thus it does not necessarily need to be a vernacular. I independently (in a personal note, ca. 2005) concluded from Wald (2007: fn. 96) that the droplets represented in the sign MZS **CHOK** (and which are optional, e.g. QRG St. E, D19a) might actually be a graphemic representation of **CH'AJ** (thus collocations with **ch'a-ji** are actually cases of full phonemic complementation). Further support for this assumption comes from several stela, where we encounter MZS suffixed with just **ji**, e.g. POB St. 3, D2 (Esparza Olguín and Pérez Gutiérrez 2009: 8, fig. 7) and UXL St. 6, B1 (Grube 2008: fig. 8.51). Their provenance makes a Tzeltalan vernacular unlikely. The same affixation pattern also appears in a prepositional construction **ti CHOK=ji** (CRN P. 1, W2). A –*Vj* nominalisation is unlikely, since there are other examples with just the –*Ø* morpheme (e.g. **ti CHOK** on IXK St. 4, E2). Hence I would transliterate these cases as **ti CHOK CH'AJ^{ji}** < *ti chok-Ø+ch'aj* as a nominalised compound. Consequently, I also consider the Tonina cases as **u=CHOK CH'AJ^{ji}** (alternatively underspelled as **u=CHOK ji**). With the absence of any syllabogram for indicating a root transitive marker, I rather argue for a Tzeltalan vernacular spelling that does not represent any status suffix (see Table 38) in favour of a Ch'olan nominal compound, as Wald (2007: 228) does. I therefore analyse as *u-chok-Ø-Ø ch'aj* (or *u-chok-Ø-Ø [ch'a]j*). The case of TNA Mon. 104 may still be a perfect form *u-chok-[o]j*, as it follows another plain status verbal statement. A spelling such as the CPN T. 22 Stone **u=CHOK^{ko} ch'a-ji** in such a context would of course still remain ambiguous: it could still represent a Ch'olan –*V$_1$* form, but the vowel of the phonemic complement could as well be silent and ignored with a nominalised form.

[316] An additional function would be the visual indication of the transitive status with a morphographic or underspelled root, e.g. with 2.g.i scheme **u=chu=wa** < *u-chu[y-u]-Ø*, "(s)he weaved", C Dr. 2c, which occurs along with 1.g.i scheme **u=chu-yu** < *u-chuy-u-Ø*. If all these assumptions apply, we must ask why specifically **=wa** was almost constantly chosen as the indicating sign. I suppose its preference because the /a/ used within this syllable is most closely to the short mid-central vowel (or schwa) [ə]. This sound is part of the WCh six-vowel system (as /ä/ or /ʌ/) and can be reconstructed to pCh, while ECh lost the contrast between [ə] and [a] (Kaufman and Norman 1984: 85-86). While present in pCh, we can only speculate on its existence in ClM, if intended in a WCh vernacular context, regular **Ca** signs were used (see footnote 169). As CHL (and supposedly pCh) feature *CaC-ʌ* (Table 36), the closest 'synharmonic' sign is **wa**, it became paradigmatic by representing the most neutral vowel

/ … < $-V_1w$, with **wV** containing the vowel of the suffix to follow. As detailed in footnote 315, the otherwise unmarked spellings might have rather led the reader to conclude a nominalised or an actual vernacular spelling instead of the ClM form. Even though the ClM root transitive marker is a vowel only form rather in most if not all epigraphic instances, it still is a good case for the objectives (see Chapter 2.1). Even though the most common allomorph lacks a final consonant, on a graphematic level we still have it indicated with a distinct syllabogram for an overspelled, integrative spelling in most cases. This is the second implication: The **=wa** did not only serve as a visual marker, but to deliberately provide an overspelling of a consonant to indicate that the morpheme string is vowel final, since **CV-C(V)** < *CVC* is the basic rule of reading[317].

For non-CVC 'root' transitives, the linguistic evidence attests a general *–V* suffix that does not necessarily has to be root vowel harmonic. While especially ECh allows any vowel, WCh is much more restricted, and the verb list for pCh (Kaufman and Norman 1984: 145) shows a preponderance for **–ä* and **–i*. In case a transitive is derived from a nominal base, pCh has most of these stems with **–ä* and **–i* and a few with **–tä*. These suffixes are the proper derivational suffixes, the status marker is *–Ø*. As the etymology of non-CVC verbs (which are regarded as root transitive) has not satisfactorily been resolved (see e.g. the discussion about *il-a* in MacLeod and Sheseña [2013: 204-205]), non-CVC 'root' transitives and derived transitives are not separately investigated. As *–V* is stem formative, their forms and spellings will be discussed together with CVC root transitives with $-V_1$. As non-CVC and derived transitives end on a vowel like CVC transitives, the assumption can be made that in writing we also find **CV=wa** / __# < *–V* spellings (see footnote 75). The above graphotactic considerations also factor in here, especially with a morphographically written root, where **=wa** serves as the visual marker for a transitive. An underspelling by **CV=Ø** / __# < *–V* or **=ta=Ø** / __# < *–ta* is equally possible and potentially preferred with syllabic spelling to demarcate this subclass from CVC transitive verbs.

Yukatekan and Tzeltalan do not contribute to the vocalisation of the ClM root transitive marker, as both are innovations. Some particular pYu verb inflections of the form **(t)u=CV-CV=ja** [+COM]

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for all other $-V_1$ suffixes. An interesting observation of the Triginya writing system in Ethiopia, which only knows CV and CVC syllables, shows that word final C are written as Cə (Béland, Prunet and Peretz 2009: 419). When the final /h/ of pGT *$-V_1$*-h* / __# was already elided in a pre-pCh stage (footnote 312), the 'neutral' vowel **wa** sign might also haven been used as a graphemic (not phonemic) indicator of / … with the 3SG.ABS *–Ø* (alluding that it was perceived as a morpheme by the Classic scribes). Both the linguistic argument for ClM $-V_1$ as well as the graphematic premises for **wa** argue against the morphosyllable ****WA** (Houston, Robertson and Stuart 2001b: 16). If, as argued by the authors (Houston, Robertson and Stuart 2001b: 15), morphosyllables were to underspecify the phonemics of a suffix, we should find spellings of the form **u=CV$_1$-CV$_2$=wa**, as argued for the passive (Houston, Robertson and Stuart 2001b: 23, fig. 7). The scarcity of such **CV$_1$-CV$_1$=ja** spellings was taken as an argument against morphosyllables (Gronemeyer 2011b: fn. 20), and no such spelling scheme 2 example has yet been described for root transitives in the literature.

317 Of course, we have **CV-CV** / **CVC-CV** spellings that read as *CVC-V* morpheme strings (see footnotes 84, 121 and 290). Spelling group 2 examples necessarily require an overspelling, as in **u=CHOK=wa** < *u-chok[-o]* (SBL Tab. 3, R1a) to indicate the root transitive inflection (as a final **V** sign as in ****u=CHOK=o** is only used to indicate a *CV'* form, as **tz'i-i** < *tz'i'* on TNA Mon. 89, A1). Also see Chapter 3.2.2, section 3b.

have been identified (Wald 2004a: 42-45)[318], while *(**k)u=CV-Ci=ki** [+INC] is still pending attestation[319]. Tzeltalan vernaculars are possibly present (footnote 315).

The final question considers the aspect that the inscriptions were generally recorded in, here we additionally have to consider preposed aspect markers (also Chapter 3.1.7), as the status suffix alone may not be decisive. CHT (Sattler 2004: 371) and CHR (Ch'orti' 2004: 68-86) leave the completive aspect unmarked and otherwise use an aspect marker / prefix. CHL always preposes an aspect proclitic (Aulie and de Aulie 1978: 196-204), while CHN usually indicates aspect by the status suffix only, but may apply aspect markers (Knowles 1984: 72, 228-232). The general absence of aspect markers argues for the completive in the epigraphic evidence and complies with the attested patterns except CHL[320].

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-V_1 / __#*	**CV$_1$-CV$_1$=wa / CV$_1$C-CV$_1$=wa**	1.a,d.i,ii
		CV$_1$-CV$_1$ / CV$_1$C-CV$_1$	1.g.i
		CV$_1$C=V$_1$-wa	1.e.i
	* *√-V_1w / …*	**CV$_1$-CV$_1$=wV=CV / CV$_1$C-CV$_1$=wV=CV**	1.a,d.i,ii
		CV$_1$C=V$_1$-wV=CV	1.e.i
	* *√-[V_1] / __#*	**CV$_1$-CV$_2$=wa / CV$_1$C(-CV$_2$)=wa**	2.b,c.i,ii (2.e.i,ii)
	√-V / __#	**CV$_1$-CV=wa / CV$_1$C-CV=wa**	1.a,b,c,d.i,ii
		CV$_1$-CV / CV$_1$C-CV	1.g.i
	√-[V] / __#	**CV$_1$-CV$_2$=wa / CV$_1$C(-CV$_2$)=wa**	2.b,c.i,ii (2.e.i,ii)
Eastern Ch'olan	* *√-V_t V_t={i,e}*	**CV$_1$-CV$_t$ / CV$_1$C-CV$_t$**	1.g.i
Western Ch'olan	* *√-e'*	**CV$_1$-Ce(-e) / CV$_1$C(-Ce)(-e)**	1.a,b,c,d.i (1.g.i)
	(*) *√-i*	**CV$_1$-Ci / CV$_1$C-Ci**	1.g.i
Yukatekan	* *√-ik*	**CV$_1$-Ci=ki / CV$_1$C-Ci=ki**	1.a,b,c,d.i
	* *√-[i]k*	**CV$_1$-CV$_1$=ki / CV$_1$C(-CV$_1$)=ki**	2.a,b,c,d.i (2.e.i)
	√-aj	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**	1.a,b,c,d.i
	√-a[j]	**CV$_1$-Ca / CV$_1$C-Ca**	1.g.i
	* *√-[a]j*	**CV$_1$-CV$_1$=ja / CV$_1$C(-CV$_1$)=ja**	2.a,b,c,d.i (2.e.i)
Tzeltalan	(*) *√-Ø*	**CV$_1$-CV$_1$ / CV$_1$C(-CV$_1$)**	1.g.i

Table 40: Representative, linguistically induced spelling patterns on junctures to be expected for the root transitive marker among Ch'olan, Yukatekan and Tzeltalan.

[318] Compare e.g. to **u=jo-ch'a** < *u-joch'-a[j]-Ø* (C Dr. 6b2) and **u=pa-k'a=ja** < *u-pak'-aj-Ø* (C Dr. 15a1), along the ambiguous **u=pa-k'a** (C Dr. 15a3) as either pYu *u-pak'-a[j]-Ø* or ClM *u-pak'-a-Ø* or **u=ta-k'a** (C. M. 14a1) as *u-tak'-a[j]-Ø* or *u-tak'-a-Ø*. Also, the existence of one of the aspect markers in conflation with the ergative pronoun (cf. Tozzer 1921: 43-48) needs to be considered, although they are not always applied in the spoken language (cf. Swadesh, Álvarez and Bastarrechea 1970: 27).

[319] García Campillo (1996) was the first to propose that the appearance of **ki** in verbal contexts in Chichen Itza represents a specific YUK feature. The arguments brought forward by Lacadena and Wichmann (2002: 286) modify the original view, but none of the examples is a (root) transitive verb. In fact, the suffix discussed by García Campillo is different, as it regularly appears with (derived) intransitives.

[320] Few forms that are not completive have been attested, see footnote 290 for future inflections. The case of the CHT incompletive progressive particle *iwal* (and cognates in CHR, CHN, CHL, YUK, CHJ and TOJ) has recently been taken up again (Law 2011: 226-233, Law, Robertson and Houston 2006: 430-433). It has been reconstructed as LL **iwaal* (Justeson et al. 1985: 9) and pCh **wäl* (Kaufman and Norman 1984: 139) and was first epigraphically (tough erroneously, cf. Justeson [1984: 350]) assigned to the PDI variant of *uht* (cf. Schele 1988: 29-30). We find it written as **i-yu-wa(-la)** < *iyuwal* (with epenthesis /yu/) most importantly with multiple occurrences on CPN St. J. Where followed by verbs, none of these feature an ergative pronoun prefixed, as it would be expected both for intransitives and transitives, but possibly may represent the expected status suffix, e.g. **i-yu-wa CH'AM=wa tzi-ku** < *iywa[l] ch'am-[a](w)-Ø tzik* (CPN St. J, A3). The function of *iywal* in these cases must remain obscure and is no direct evidence for incompletive forms.

3.1.3.2 – Antipassive Suffix $–V_1w$ ~ $–Vw$ ~ $–w$

The antipassive in Ch'olan languages (Table 41) exhibits a very interesting case of development. Two antipassives were once present in pM (Kaufman 1994, A 4a: 1-10, Smith-Stark 1978: 182-183): (1) absolute/generic (removal/demotion of patient while keeping the agent as the single verbal argument) and (2) agentive/focusing (clefting of the agent while by keeping the patient as the argument), while the object incorporating antipassive (integration of patient into the predicate while keeping the agent as the argument) emerged only later. The first study on ClM has been made by Lacadena (2000a), but certain linguistic developments need to be revisited as the original study was not exhaustive. It is not necessary for the objective of this study to discuss the development of the antipassive since pM times in all details (cf. Mora-Marín [2001: 59-63, 91-92, 272-277, tabs. 2.26-2.30] for a broader discussion and form / syntax comparisons). But it is important to point out functional differences and markings as well as the fact that the development of the antipassives in the relevant GLL branches is characterised by morphosyntactic shifts and borrowings.

As Lacadena (2000a: 170-171) already outlined, the ClM *–(V)w* antipassive provides some obstacles in its evolution, especially with his (2000a: 162) correlation of this suffix to the object incorporating antipassive. Lacadena just brings forward phonological cognates, but without further validating their function (albeit with a different picture from the epigraphic evidence). For the absolutive antipassive, we can reconstruct pM **–o-an* (VER.TR.R) / * *–an* (VER.TR.D) following Kaufman (1994, A 4a: 42) > pGT **–oon* / **–an* (Mora-Marín 2001: tab. 2.22)[321]. For the agentive antipassive, we have pM **–o-w* ~ **–a-w-(an)* / *–w-(an)* (Kaufman 1994, A 4a: 43) > pGT **–aw(-an)* / **–w-an* (Mora-Marín 2001: tab. 2.22). Within the Greater Tzeltalan branch, Ch'olan only has an absolute antipassive of the frozen form *–(o)n* (Kaufman 1994, A 4a: 1), although Dayley (1990: 372) describes CHR *–(w)an*, but which in turn can be considered as a reflex to pGT **–an*. In contrast, Tzeltalan has *–(a)w-an* (Kaufman 1994, A 4a: 1) as the absolute antipassive, which Kaufman (1994, A 4a: 2-3) considers to have derived out of the pM plain status marker (see Chapter 3.1.3.1) before it became an alternate absolute antipassive in pWM and fused with the original form in Tzeltalan.

As no agentive antipassive on *–(V)w* is existent any more in Ch'olan (for a discussion see below), no forms able to contribute to the vocalisation of pCh and ClM can be used[322]. As one pCh absolute antipassive, we can reconstruct **–on* for root transitives and **–(C)-an* for derived transitives, as the constant syncopation to *–n* in CHN is the result of the suffixation with the *–a(n)* intransitiviser (Knowles 1984: 150).

[321] Note that Smith-Stark (1978: 182-183) and Dayley (1990: 383-384) alternatively reconstruct the pM absolutive and incorporative as **–(V)w* and the agentive as **–(V)n* (also followed by Lacadena [2000a] for his analysis). However, neither Wastekan nor Yukatekan (Table 42) show an absolutive antipassive cognate to their pM * *–(V)w* (Mora-Marín 2001: 61).

[322] CHL for example can use topicalisation with antipassives, although it is not comparable to the clefting of true agentive antipassives, as the agent (by -ABS) still remains with the antipassive, e.g. *joñoñ aj-mäñ-oñ-el-oñ*, "[s]oy un comprador" (Vázquez Alvarez 2002: 268).

Because of the functional shiftings of the antipassives in WM, we also find an explanation for the absence of a proper object incorporating antipassive in Ch'olan, as well as Tzeltalan (Dayley 1990: 367-375). Object incorporation does exist in Ch'olan languages (cf. Knowles 1984: 153, Quizar and Knowles-Berry 1990: 315, Vázquez Alvarez 2002: 270-276), but this process is morphologically and syntactically treated in a different way when compared to an antipassive. The morpheme sequence (ERG-)VER.TR+NOUN is treated as a nominal form, as aspect markers and status suffixes are not possible[323] (Vázquez Alvarez 2002: 270-276), in contrast to Yukatekan. Only CHR applies *–i* as a suffix with noun incorporation and it is apparently the status suffix of intransitives (see Table 46)[324].

Those forms derived with *–m* also deserve a brief mention. Several scholars have these also taken as antipassives, as they detransitivise a verb to express a habitual action by an animate agent[325]. This also complies with antipassive function in Ch'olan, Yukatekan and Tzeltalan (see below). Since the suffix appears in ECh, CHN and probably TZE, TZO and QAN, therefore a CHR innovation as suggested by Quizar and Knowles-Berry (1988: 89) seems unlikely.

Idiom	Attestations		Sources
pCh	n/a		
ECh	**-Vn*	ANTIP	(Storniolo 2008: 162)
CHT	*-yan* (?)	ANTIP	(Sattler 2004: 379)[326]

[323] Compare to CHL *mi a-jap-Ø lembal*, "[b]ebes el licor" with *k-jap-lembal*, "[m]i borrachera" (Vázquez Alvarez 2002: 271). In fact, all CHL antipassives appear to be nominal forms, e.g. compare to *k-mäñ-oñ-el*, "[m]i compra" and the use of auxiliary verbs to provide aspect, e.g. *tyi i-cha'l-e-Ø mäñ-oñ-el x-ixik*, "[l]a mujer compró [literally: la mujer hace compras]" (Vázquez Alvarez 2002: 265, 267). However, Schumann Gálvez (cited in Lacadena [2000a: fn. 18]) was able to provide examples such as *mi-k choñ-oñ-el säk ixim*, "I sell white maize", where *–el* is supposed to represent the incompletive of intransitives (with the aspect marker *mi*). I am not convinced by Lacadena's interpretation as an incorporating antipassive, but lack a conclusive counter proposal other than it almost appears like a 'crazy' antipassive (cf. Kaufman 1994, A 2a: 49). The confusion about antipassives and nominal forms can also be account to the same marking in WCh (see footnote 439). CHN furthermore utilises nominalising suffixes, compare transitive *kä häk-s-en-Ø te?*, "I lower wood" with *kä häk-s-aya-(a)h=te?*, "My wood-lowering", where *–aya* (see Table 56) is a nominaliser of causatives (Knowles 1984: 187-188). In fact, CHN rather forms nominal compounds of a verbal noun and a root noun that can be inflected with an ergative pronoun to introduce the agent. These can be verbalised again (Knowles 1984: 154), but it unclear whether the resulting verb is an intransitive antipassive or a transitive form (Quizar and Knowles-Berry 1988: 91). The CHR *–(i)an* suffix after causatives (Fought 1967: 197, 239) seems to have a similar function.

[324] Quizar and Knowles-Berry (1988: 90-91) parallel it to the status marker of root transitives. This seems unlikely, considering that object incorporation never produces a transitive form. Compare *e winik war u-pak-i-Ø e nar* with *e winik war a-pak-nar-i*, "the man is doubling over the cornstalks." The incorporated form is prefixed with the set C pronoun (Ch'orti' 2004: 66) used for incompletive intransitives. Wichmann (2004a: 331) provides the completive counterpart *pak-nar-i-Ø*, "he doubled over cornstalks". This suffix is purely intransitive, incorporations can also be nominalised with a *–Ø* morpheme, as *u-pak-Ø-nar-Ø*, "[it is] his cornstalk-doubling" (note the added *–Ø* nominaliser in addition to Wichmann). As Wichmann correctly construes, the abundant spellings for *u-tz'ap-Ø+tun-Ø* or *u-k'al-Ø+tun-Ø* are also nominalised antipassives.

[325] The spelling **ma-a to-sa=ma** on CPN Alt. Z, C3 (see footnote 71) might therefore indeed be proof of an ECh if not CHR vernacular antipassive, as the subject in the phrase in question is the Copan king *Yax Pahsaj Chan Yo'at*.

[326] Sattler quotes Morán that antipassives were non-existent in CHT, although she provides the example <*Dios coquian taba*> as "God may protect you", from the root transitive <*coco*>. She interprets this form as an antipassive, although she was not able to determine the productivity of the apparent *–yan* suffix. A comparison with CHR (Fought 1967: 197, 239) however shows a cognate form, although it only appears after a causative in CHR, which is not the case in CHT. The appearance of the initial glide in both the CHT and CHR examples may have implications on an apparent *–y* intransitiviser among some instrumentals and nominalisations (see footnotes, 404, 437 and 441). With respect to the *–V_1y* mediopassive of ClM, an ECh reflex may be considered (see

CHT	*-m-a-*	HAB	(Fought 1984: 55)
CHR	*-wan*	ANTIP < VER.TR.R (absolute)	(Dayley 1990: 372)
CHR	*-(w)an*	ANTIP < VER.TR.D (absolute)	(Dayley 1990: 372)
CHR	*-an*	ANTIP < VER.TR.D (absolute)	(Quizar and Knowles-Berry 1990: 314)
CHR	*-o*	ANTIP < VER.TR	(Wichmann 1999: 61-62)
CHR	*-on*	ANTIP < VER.TR.R (absolute)	(Quizar and Knowles-Berry 1990: 314)[327]
CHR	*-on*	ANTIP < VER.TR.R (absolute)	(Dayley 1990: 372)
CHR	*-on*	ANTIP < VER.TR	(Wichmann 1999: 62-64)
CHR	*-o(')n*	ANTIP < VER.TR	(Ch'orti' 2004: 139)
CHR	*-on*	ANTIP < VER.TR [-CAUS]	(Fought 1967: 197)
CHR	*-(i)an*	ANTIP < VER.TR [+CAUS]	(Fought 1967: 197, 239)
CHR	*-on, -an*	INTRS	(MacLeod 1987: fig. 4)
CHR	*-san*	ANTIP < VER.TR	(Ch'orti' 2004: 139)[328]
CHR	*-s-an*	ANTIP < CAUS	(Wichmann 1999: 68-69)
CHR	*-r-an*	ANTIP < ITER	(Wichmann 1999: 69)
CHR	*-m*	ANTIP < VER.TR.R (absolute)	(Dayley 1990: 372)[329]
CHR	*-ma*	ANTIP < VER.TR.R (absolute)	(Quizar and Knowles-Berry 1990: 314)
CHR	*-ma*	INTRS	(Oakley 1966: 244)
CHR	*-m-a*	ANTIP < VER.TR	(Wichmann 1999: 64-68)
CHR	*-i*	ANTIP (incorporating)	(Quizar and Knowles-Berry 1990: 315)[330]
CHN	*-Vn ~ -Vm*	ANTIP < VER.TR (absolute)	(MacLeod 1987: fig. 14)
CHN	*-n*	ANTIP < VER.TR (absolute)	(Knowles 1984: 150)
CHN	*-n*	ANTIP < VER.TR.R (absolute)	(Quizar and Knowles-Berry 1990: 315)
CHN	*-n*	INTRS < VER.TR	(Keller and Luciano 1997: 458)
CHN	*-n-a-n*	ANTIP < VER.TR [+INC]	(MacLeod 1987: fig. 14)
CHN	*-n-i*	ANTIP < VER.TR [+COM]	(MacLeod 1987: fig. 14)
CHN	*-m-a-n*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 16)[331]
CHN	*-m-i*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 16)
CHN	*-m*	INTRS < VER.TR	(Keller and Luciano 1997: 458)
CHL	*-Ø*	ANTIP < VER.TR.R (incorp.)	(Vázquez Alvarez 2002: 270-276)
CHL	*-on*	ANTIP < VER.TR.R	(MacLeod 1987: fig. 14)
CHL	*-oñ*	ANTIP < VER.TR (absolute)	(Vázquez Alvarez 2002: 51, 56, 264)

Table 41: Ch'olan forms for the derivational antipassive suffix.

The prevalent antipassive in Yukatekan (Table 42) according to Kaufman (1994, A 4a: 42) is *–n* ~ *–Ø*. It is a direct reflex of the pM absolutive antipassive **–o-an* / **–an*. No overt marking is done in the incompletive, while the completive is marked by *–n-aj*. Additionally, LAK and YUK feature a vowel lengthening and/or tonal change. Indeed, *–n* ~ *–Ø* is the proper derivational suffix (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 333), as ITZ with only occasional root vowel changes in the incompletive only

footnote 392), as it is still found in CHL as well (see Chapter 3.1.4.1). Following the derivational paradigm for instrumentals (see Chapter 3.1.5), there is also the example <*ubianib*> (Sattler 2004: 385) where *–yan* intransitivises a transitive verb to form an instrumental.

[327] While *–on* and *–ma* both occur with root transitives, the latter is reserved to an animate subject, thus semantically an agent. In contrast, *–on* is restricted to inanimate subjects. The same can be assumed for the *–n* and *–m* forms in CHN.

[328] The only example given is *pejksan*, "[l]lamó". Hull (2005: 94) classifies *pejka* as a non-CVC transitive, and further examples like *ch'akarsan* and *t'e'nsan* (Hull 2005: 26, 107) suggest that *–san* may furthermore be restricted to derived transitives, as also supported by Wichmann (1999: 68-69).

[329] See footnotes 134 and 136 for further considerations as an antipassive instead of being either a morphophonemic variant to derived transitive passive *–n*. This observation also concurs with Dayley's description that *–m* "enfatiza , ya sea que el agente acostumbra a ejecutar la acción [...]."

[330] This suffix appears the same as the thematic vowel of the original transitive, but hence the antipassive is a valency-decreasing mechanism, both forms are not related. It is probably an innovation (Quizar and Knowles-Berry 1990: 315).

[331] MacLeod describes this suffix to be of limited productivity. By comparison with other Ch'olan forms (Table 6), this form can be described as an antipassive rather (also see footnotes 134 and 136).

(Hofling 1991: 34) proves. The changes in LAK and YUK are therefore morphophonemically conditioned and are not comparable to the glottal insertion (and tonal alteration) for the passive formation (see Chapter 3.1.1.1) in these languages. MOP is frequently told to not feature any antipassive derivation, but some scant evidence suggests at least antipassive use (including object incorporation) of certain verbs without any overt marking.

The range of lexical classes to serve as the basis for antipassives is far greater than in Ch'olan. Besides root and derived transitive verbs (including causatives via *–es* and affectives and positionals via *–baj*), nouns can also be intransitivised this way e.g. in ITZ (Hofling 1991: 34).

An agentive antipassive is absent in Yukatekan (while agent fronting is achieved by other ways [Tonhauser 2003]), but unlike Ch'olan, it features a true object incorporative antipassive to produce fully inflectable verbs[332]. Several studies have dealt with the morphology and semantics of object-incorporating antipassives (Bricker 1978, Sullivan 1984).

Idiom	Attestations		Sources
ITZ	*-Ø-Ø*	ANTIP < VER.TR [+INC]	(Hofling and Tesucún 2000: 67)
ITZ	*-Ø*	ANTIP < VER.TR [+INC]	(Hofling 1991: 34)
ITZ	*-Ø*	ANTIP < VER.TR [+INC]	(Itza' 2001: 100-101)
ITZ	*-n*	ANTIP [+COM,+PRF,+SBJV]	(Hofling 1991: 34-35)
ITZ	*-n-aj*	ANTIP < VER.TR [+COM]	(Hofling and Tesucún 2000: 68)
ITZ	*-n-ah(-ih)*	ANTIP < VER.TR [+COM]	(Bricker 1986: tab. 10)
ITZ	*-n-ak*	ANTIP < VER.TR [+DEP]	(Hofling and Tesucún 2000: 68)
MOP	*-Ø* (?)	ANTIP < VER.TR (a.)	(Kaufman 1994, A 4a: 42)
MOP	*-Ø*	ANTIP < VER.TR.R	(Schumann Gálvez 1997: 151-52)
MOP	*-Ø*	ANTIP < VER.TR.R (i.)	(Schumann Gálvez 1997: 154-156)[333]
MOP	*-Ø*	ANTIP < VER.TR.R	(Mopan 2001: 288-289)
MOP	*-Ø-äl*	ANTIP < VER.TR [+INC]	(Hofling 2011: 14)
MOP	*-n-Ø*	ANTIP < VER.TR [+COM]	(Hofling 2011: 15)
MOP	*-n-äk*	ANTIP < VER.TR [+DEP]	(Hofling 2011: 15)
MOP	*-aj*	ANTIP < VER.TR.D [+CAUS]	(Schumann Gálvez 1997: 152-153)

[332] Compare e.g. the YUK transitive *t in č'ak-ah-Ø* čeʔ *ʔičil in kòol*, "I chopped a *tree* in my cornfield" with antipassive *č'ak-čeʔ-n-ah-en ʔičil in kòol*, "I chopped *trees* in my cornfield" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 354). With the intransitivations, the aspect marker is elided, but the marker *–aj* clearly indicates the completive. The focus of the antipassive form rather lies on a generalised action.

[333] Among the paradigms, the verb *sool*, "mudar, pelar" is described as intransitive (Schumann Gálvez 1997: 155), while still forming a compound with a noun: *in soolto'*, "pelo caña". Unlike the transitive *in ch'äkche'*, "corto árboles", it could thus not be considered an incorporating antipassive (cf. Hofling 2011: 20). However, it features an agent (by 1SG.ERG) and an incorporated object. A form like *soolto'* thus resembles for what Grube (2004d: 74-75) coined the term "intransitive compounds" of VER.INTR+NOUN or POS+NOUN. While MOP only provides the transitive verb *sool* as "peel" as well as an active verbal noun root *sool* "shed skin of snake, fish scales, bark from dry wood" (Hofling 2011: 390), ITZ (Hofling and Tesucún 1997: 567) provides evidence for a polyvalent root *sool* with a nominal meaning "shell, skin, peel, dead leaves in the ground", a root transitive form *sool* "skin (an animal), peel, shell" contrasted with the derived transitive *sooltik*, but also a root intransitive participle *soola'an*, "skinned" contrasted to the passive participle *soolb'il*. This may resolve the above problem. A study of transitivity alternation in YUK has also not delivered evidence for intransitives incorporating nouns (Krämer and Wunderlich 1999). As far as Grube's examples are concerned, he provides *chum-tuun*, "stone-seating" and *chum-tz'am*, "throne-seating"). Considering that positionals and transitives are blurred classes (cf. Wichmann 2002a: 7-8), this example easily resolves. The cases of *el-naah* (also in the lexicalised *elk'in*, "east"), *och-bih*, *och-witz*, *och-ha'* or *och-k'ahk'* are more complicated as these verbal roots are widely attested as intransitive in LL. Noun incorporation in the Ch'olan branch has only been described with transitive verbs (see above). The 'intransitive compound' issue also cannot be resolved with a *–Ø* nominaliser (see Chapter 4.1.14), as a nominal form would require an ergative pronoun to morphosyntactically bind the agent. These constructions have to be intransitive and only graphematically appear as a compound, but not morphologically.

MOP	*-aj*	ANTIP < VER.TR.D [+CAUS]	(Mopan 2001: 289)
LAK	*<V>…-Ø*	INTRS < VER.TR.R [+INC]	(MacLeod 1987: fig. 27)
LAK	*-Ø*	ANTIP < VER.TR [+INC]	(Bricker 1986: tab. 10)
LAK	*-Ø*	ANTIP < VER.TR [+INC]	(Kováč 2012: 2)[334]
LAK	*-Vl, -Vn*	ANTIP < VER.TR [+INC]	(Bricker 1986: tab. 10)
LAK	*<V>…-n-ʌh*	INTRS < VER.TR.R [+COM]	(MacLeod 1987: fig. 27)
LAK	*-n-əh(-ih)*	ANTIP < VER.TR [+COM]	(Bricker 1986: tab. 10)
LAK	*-n-əh-k*	ANTIP < VER.TR [+SBJV]	(Bricker 1986: tab. 10)
YUK	*-Ø*	ANTIP < VER.TR.R [+INC] (i.)	(Beltrán 1859: § 58)[335]
YUK	*-Ø*	ANTIP < VER.TR.R [+INC] (i.)	(Dayley 1990: 378)
YUK	*-Ø*	ANTIP < VER.TR.R [+INC] (i.)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 354)
YUK	<\`V_1>…-Ø	ANTIP < VER.TR.R	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 333, 349)
YUK	<\`V_1>…-Ø	ANTIP < VER.TR.R [+INC] (a.)	(Dayley 1990: 377)
YUK	*<\`V>…-Ø*	INTRS < VER.TR.R [+INC]	(MacLeod 1987: fig. 27)
YUK	*-ah*	ANTIP < VER.TR.D [+INC]	(Smailus 1989: 37-38)
YUK	*-ah-Ø*	ANTIP < VER.TR.D [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 350)
YUK	*-aj*	ANTIP < VER.TR.D [+INC] (a.)	(Dayley 1990: 377)
YUK	*-n ~ Ø*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 42)
YUK	*-n-ah*	INTRS < VER.TR.R [+COM] (i.)	(Tozzer 1921: 35)
YUK	*-n-aj*	ANTIP < VER.TR.R [+COM] (i.)	(Dayley 1990: 378)
YUK	*-n-ah-(ih)*	ANTIP < VER.TR.R [+COM] (i.)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 354)
YUK	*-ah-nah*	ANTIP < VER.TR.D [+COM]	(Smailus 1989: 37-38)
YUK	<\`V_1>…*-n-aj*	ANTIP < VER.TR.R [+COM] (a.)	(Dayley 1990: 377)
YUK	<\`V_1>…*-n-ah*	ANTIP < VER.TR.R [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 349)
YUK	*<\`V>…-n-ah*	INTRS < VER.TR.R [+COM]	(MacLeod 1987: fig. 27)
YUK	*-aj-naj*	ANTIP < VER.TR.D [+COM] (a.)	(Dayley 1990: 377)
YUK	*-ah-n-ah(-ih)*	ANTIP < VER.TR.D [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 350)
YUK	*-n-ăk*	INTRS < VER.TR.R [+SBJV] (i.)	(Tozzer 1921: 35)
YUK	*-n-ak*	ANTIP < VER.TR.R [+SBJV] (i.)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 354)
YUK	*<\`V>…-n-ak*	ANTIP < VER.TR.R [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 349)
YUK	*-ah-n-ac*	ANTIP < VER.TR.D [+SBJV]	(Smailus 1989: 37-38)
YUK	*-ah-n-ak*	ANTIP < VER.TR.D [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 350)

Table 42: Yukatekan forms for the derivational antipassive suffix.

Following Kaufman (1994, A 4a: 1, 3, 43), the Tzeltalan branch (Table 43) features *–(a)w* as the generic antipassive that is usually combined with *–an*. The omittance of the vowel depends on the root shape. Only TZO knows an agentive antipassive *–on* (Aissen 1999, Kaufman 1994, A 4a: 6, 42) likely diffused from the CT branch[336]. The antipassive with *–(o)maj* resembles the Ch'olan forms on *–m(a)*. Generally, the Tzeltalan antipassive is used for characteristic or habitual actions (cf. Haviland 1981: 275), also occasionally with slight shifts in meaning[337].

It is important to observe that the antipassive forms in Tzeltalan are reverse to the suffixes and functions reconstructed for pM and more in line with ClM. Kaufman (1994, A 4a: 2, 8) considers the innovation of a **–(a)w* detransitiviser in the 'Huehuetenango sphere' (including MAM), thus it is WM,

[334] The example is "se vende tortillas" as *kanik wah*. Two peculiarities can be noticed: As sometimes ITZ (Itza' 2001: 100-101), the root transitive modal suffix *–ik* is not deleted and no overt 3SG.ERG is provided, while **u kan wah* would be expected.

[335] Tozzer (1921: 36) refers to Beltrán (1859: § 58) that noun incorporations mostly occur in the completive and subjunctive aspects, the latter also provides the completive allomorphs *–n-i* and *–n-ah-i*, e.g. *c̄hahaani ~ c̄hahaanahi*, "acarreó agua". The incompletive is visible in *c̄hahaa*, "acarrear agua".

[336] Kaufman (1994, A 4a: 6) considers the innovation of agentive *–on* after 500 AD within CHJ, causing the shift to *–w* as absolutive/incorporating at the same time. The percolation of *–on* into TZO therefore would post-date 500 AD. This of interest regarding the question of the ClM forms discussed below.

[337] Compare to *tiʔawan*, "bark, bite" < *–tiʔ*, "bite" and *naʔawan*, "remember" < *–naʔ*, "know". However, the semantics remain the same, "remember" is the habitual (or recurrent) action of knowing something.

but without Ch'olan[338]. This assumption and its broader implications are discussed below in relation to the ClM forms.

Idiom	Attestations		Sources
pTz	**-aw*	INTRS < VER.TR.R (absolute)	(Kaufman 1972: 142)
pTz	**-omax*	INTRS < VER.TR.R (absolute)	(Kaufman 1972: 142)
pTz	**-Vln ~ -in*	INTRS < VER.TR.R (absolute)	(Kaufman 1972: 142)
pTz	**-b'ax*	INTRS < VER.TR.R (absolute)	(Kaufman 1972: 142)
TZE	*-aw*	INTRS < VER.TR	(Kaufman 1971: 56)
TZE	*-wan*	ANTIP < VER.TR /CVCVC	(Slocum 1948: 84)
TZE	*-wan*	ANTIP < VER.TR	(Radhakrishnan 1970: 401)
TZE	*-awan*	ANTIP < VER.TR /CVC	(Slocum 1948: 84)
TZE	*-awan*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 42, 43)
TZE	*-awan*	ANTIP < VER.TR (absolute)	(Dayley 1990: 370)
TZE	*-(o)ma(h)*	INTRS < VER.TR (customary)	(Kaufman 1971: 58)
TZE	*-omaj*	ANTIP < VER.TR (absolute)	(Dayley 1990: 370)
TZE	*-(Ṽ)we(h)*	INTRS < VER.TR,NOUN	(Kaufman 1971: 58-59)
TZE	*-(V)wej*	ANTIP < VER.TR (absolute)	(Dayley 1990: 370)[339]
TZO	*-van*	ANTIP	(Haviland 1988: 85, 115-116)
TZO	*-van*	ANTIP < VER.TR	(Haviland 1981: 274-275)
TZO	*-wan*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 42, 43)
TZO	*-wan*	ANTIP < VER.TR (absolute)	(Dayley 1990: 368)
TZO	*-av*	INTRS	(García de León 1971: 25)
TZO	*-av ~ -Vv(-ax)*	INTRS	(Cowan 1969: 100)
TZO	*-aw*	ANTIP < VER.TR (abs., n.p.)	(Kaufman 1994, A 4a: 43)
TZO	*-(o)maj, -Vwaj*	ANTIP < VER.TR (non-prod.)	(Dayley 1990: 368)
TZO	*-on* /_-3SG.ABS	ANTIP < VER.TR (agentive)	(Dayley 1990: 368)
TZO	*-on* /_-3SG.ABS	ANTIP < VER.TR	(Haviland 1981: 273-274)
TZO	*-on*	ANTIP < VER.TR (agentive)	(Kaufman 1994, A 4a: 42)

Table 43: Tzeltalan forms for the derivational antipassive suffix.

In major difference to all other modern WM languages, Greater Q'anjobalan features all three types of antipassives (Table 44). As part of the 'Huehuetenango sphere', all languages feature a contrast of absolute/incorporating and agentive antipassive in reverse to the reconstructed pM suffixes (Kaufman 1994, A 4a: 1-4, 8). This has to be seen as an innovation. Interestingly, the perfect marker (Chapter 3.1.7) is also a feature of a geographical continuum involving the 'Huehuetenango sphere'.

If pWM lost the exclusive **–(a)w* agentive antipassive as proposed by several authors (Kaufman 1994, A 4a: 2, 3, 6, Mora-Marín 2001: 276), it became homosemic with the absolute * *–(o-)an* antipassive. With the reintroduction of the agentive antipassive (see footnote 336) within the Greater Q'anjobalan branch, the functions were redistributed. How the situation of the neighbouring GM and PQ (if the geographic continuum is prolonged), which have both functions with the same marking

338 The addition of *–an* is also a Tz innovation, from where it diffused to TOJ. Kaufman (1994, A 4a: 8) in turn sees the influence from this sphere (thus by GQa rather?) to Tzeltalan, where also the marking of incorporating antipassives with *–wan* is supposed to derive from. While plausible for absolute and TZO agentive antipassive, no incorporating antipassive is described in TZE and TZO grammars, so this statement has to remain unproven.

339 In contrast, Kaufman (1972: 142) reconstructs **–{i,o}w{e,a}x* as an intransitiviser of nouns (and potentially other roots) for pTz. The resulting derivations (e.g. TZE [Slocum 1948: 78-79]) semantically behave as incorporating antipassives, yet there is no transitive root involved. An act or process for obtaining or using the noun is inherent, though, compare to *siʔweh*, "gather fire-wood" < *siʔ*, "fire-wood", or *c'iʔweh*, "hunt with dogs" < *c'iʔ*, "dog".

(Kaufman 1994, A 4a: 1), influenced the development of the Greater Q'anjobalan branch is not satisfactorily clarified.

Within the highly innovative environment of the 'Huehuetenango sphere', it is difficult to provide some general, reconstructive forms for the antipassive as the "least studied subgroup" (Campbell and Kaufman 1985: 190) of Mayan languages. Especially TOJ and its intensive contact with TZE (Campbell and Kaufman 1985: 190, Kaufman 1994, A 4a: 2, 6, 8) provides problems, which also led to its classification as a Tzeltalan language (e.g. Robertson 1977b).

For the absolute antipassive, **–w-a(j)* seems to be the common form, based on CHJ, QAN, AKA and POP, especially when it entirely removes the patient, but also for demoting it. There is some evidence for **–w-i* / __# ~ **–w* /… in the same function, but the evidence from CHJ, QAN, AKA and POP is stronger that it is rather used for the object incorporation antipassive. With the exception of TOJ, none of the Greater Q'anjobalan languages has a vowel initial absolutive antipassive. In fact, TOJ shows further deviances its siblings, its derivation can be analysed as *–w-Vn*, the proper intransitiviser and an intransitive stem formation suffix. This is more in accordance with TZE and TZO again.

The agentive antipassive can be reconstructed to **–(V)n-i* / __# ~ **–(V)n* / … by the evidence from all Greater Q'anjobalan languages. The absence of the vowel is generally the reason of two morphophonemic conditions: (1) the antipassive is phrase final or (2) the base is a derived transitive (where it may be preceded by a vowel, but rather as part of the derived root). The default vowel is [o], but [a], [i] and [u] are also existent in TOJ (through innovation or diffusion?). Interestingly, QAN and POP also have evidence for a *–n* incorporating antipassive.

Even more interesting is the case of MCH. While data are very scarce, the examples provided in footnote 349 show that it has an absolute of the form *–VVn* which is more in accordance with the pM pattern and outside the general Greater Q'anjobalan pattern.

A possible cognate to the Ch'olan habituative on *–m* might be existent in QAN (footnote 344). As in the other branches, we frequently find a more general sense among antipassives verbs in Greater Q'anjobalan as compared to the transitive meaning.

Idiom	**Attestations**		**Sources**
CHJ	*-w-(ax)-(ih)*	ANTIP < VER.TR.R,POS,NOUN	(Hopkins 1967a: 87-88)[340]
CHJ	*-waj*	ANTIP < VER.TR.R	(Domingo Pascual 2007: 181-182)
CHJ	*-waj*	ANTIP < VER.TR (absolute)	(Dayley 1990: 363)
CHJ	*-waj*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 43)
CHJ	*-waj*	ANTIP < VER.TR (absolute)	(Buenrostro Díaz 2005: 226)
CHJ	*-waj*	ANTIP < VER.TR (absolute)	(Buenrostro Díaz 2009: 104)
CHJ	*-waji*	ANTIP < VER.TR (absolute)	(García Pablo and Domingo Pascual 2007: 252-253)
CHJ	*-wi*	INTRS	(Williams and Williams 1966: 231)[341]

[340] Hopkins' data do not allow a clear differentiation as per the different agentive types that later studies (e.g. Buenrostro Díaz 2005) revealed. Refer to the following examples: *láw-w-(ih)*, "to fan" < *láw*, "to fan something; *mák'-w-ax-(ih)*, "to fight" < *mák'*, "to strike something" from transitive roots. A positional derivation is *kót-w-(ih)*, "to walk on all fours" < *kót*, "standing on four legs", from a nominal base *púk-w-al*, "distribution" < *púk*, "to distribute something". The suffix is therefore not solely a detransitiviser, but an intransitiviser in general, possibly two homophonous, but functionally different *–w* suffixes need to be isolated. The *–w-al* to derive nominals may be connected to the TZE agentive (see footnote 459).

CHJ	*-wi*	ANTIP < VER.TR (incorporate)	(Buenrostro Díaz 2005: 226)
CHJ	*-w(-i)*	ANTIP < VER.TR (incorporate)	(Buenrostro Díaz 2009: 140, 186)[342]
CHJ	*-w*	ANTIP < VER.TR (incorporate)	(Dayley 1990: 363)
CHJ	*-w*	ANTIP < VER.TR (incorporate)	(Kaufman 1994, A 4a: 43)
CHJ	*-w*	ANTIP < VER.TR (incorporate)	(García Pablo and Domingo Pascual 2007: 252-253)
CHJ	*-(a)n*	ANTIP < VER.TR	(García Pablo and Domingo Pascual 2007: 133-134)
CHJ	*-an*	ANTIP < VER.TR (agentive)	(Dayley 1990: 363)
CHJ	*-an*	ANTIP < VER.TR (agentive)	(Buenrostro Díaz 2005: 226)
CHJ	*-an*	ANTIP < VER.TR (agentive)	(Buenrostro Díaz 2009: 131, 137-139, 165, 180, 209)
TOJ	*-wan*	actor-experience voice	(Lenkersdorf 2002: 185-187)
TOJ	*-wan*	ANTIP < VER.TR (absolute)	(Buenrostro Díaz 2005: 226)
TOJ	*-wan*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 43)
TOJ	*-wan ~ -wun*	ANTIP < VER.TR (absolute)	(Dayley 1990: 364)
TOJ	*-w_1-un, -w_1-an$_1$*	INTRS < VER.TR (absolutive)	(Furbee-Losee 1976: 66-67)
TOJ	*-w*	ANTIP < VER.TR (absolute)	(Kaufman 1994, A 4a: 43)
TOJ	*-AW1*	ANTIP < VER.TR	(Furbee-Losee 1981, II: 92)
TOJ	*-Vn*	ANTIP < VER.TR (agentive)	(Dayley 1990: 364)
TOJ	*-an ~ -un ~ -in*	ANTIP < VER.TR	(Supple and Douglass 1949: 172)
TOJ	*-IN1*	INTRS < VER.TR	(Furbee-Losee 1981, II: 28)
TOJ	*-ON1 ~ UN1*	INTRS < VER.TR	(Furbee-Losee 1981, II: 57, 81)
TOJ	*-C1R/{O,U}N1*	INTRS < VER.TR	(Furbee-Losee 1981, II: 93)
TOJ	*-Ø*	ANTIP < VER.TR (incorporate)	(Buenrostro Díaz 2005: 227)
QAN	*-w*	ANTIP < VER.TR (absolute)	(Zavala Maldonado 1992b: 274)
QAN	*-w*	ANTIP < VER.TR	(Q'anjob'al 2005: 117, 182-183)
QAN	*-w*	ANTIP < VER.TR (incorporate)	(Francisco Pascual 2007: 52)
QAN	*-wi*	ANTIP < VER.TR (incorporate)	(Mateo Toledo 2008: 72)
QAN	*-wi ~ -waji*	ANTIP < VER.TR	(de Diego Antonio et al. 2001: 38)
QAN	*-waj*	ANTIP < VER.TR (absolute)	(Q'anjob'al 2005: 117, 182)
QAN	*-waj*	ANTIP < VER.TR	(Francisco Pascual 2007: 53)
QAN	*-waj*	ANTIP < VER.TR (absolute)	(Mateo Toledo 2008: 72)
QAN	*-wa*	ANTIP < VER.TR (demoting)	(Zavala Maldonado 1992b: 274)
QAN	*-o*	ANTIP < VER.TR (incorporate)	(Zavala Maldonado 1992b: 274)
QAN	*-on*	ANTIP < VER.TR	(Lara Martínez 1994: 61-64)
QAN	*-on*	ANTIP < VER.TR (agentive)	(Zavala Maldonado 1992b: 274)
QAN	*-on*	ANTIP < VER.TR (agentive)	(Francisco Pascual 2007: 49)
QAN	*-(o)n(-i)*	ANTIP < VER.TR	(Mateo Pedro 2009: fn. 1, 2010: 47)[343]
QAN	*-on-i*	ANTIP < VER.TR	(Martin 1977: 130)
QAN	*-(o)n*	ANTIP < VER.TR (agentive)	(Q'anjob'al 2005: 117, 183)
QAN	*-n*	ANTIP < VER.TR.D	(Francisco Pascual 2007: 47)
QAN	*-moj*	INTR < VER.TR	(Francisco Pascual 2007: 46)[344]
AKA	*-w*	INTRS	(Zavala Maldonado 1992a: 61)[345]
AKA	*-wi*	ANTIP < VER.TR	(Akateka 2007: 280-281)

[341] The antipassive use is clear by the given example "cuywi *to study* (cuy *to study something*)". Also refer to footnote 136 for CHT and CHR *–ma*, which also was not always aptly described or misunderstood in grammars.

[342] In the cited instances, the incorporating antipassive is clearly mistaken as the mediopassive voice – which is apparently absent in CHJ and other Greater Q'anjobalan languages (see Chapter 3.1.4.1). Compare the passive example *ix-Ø-mak-ji te' pwerta* with the antipassive *ix-Ø-mak-wi te' pwerta*, "[l]a puerta se cerró" (Buenrostro Díaz 2009: 186).

[343] The function of *–i* in QAN is somehow problematic (Mateo Pedro 2010: 49-50), it may appear in clause final position or indicate nominalisation (also see Chapter 3.1.6). The suffix *–on* (VER.TR.R) ~ *–n* (VER.TR.D) in the latter case intransitvises verbs prior to nominalisation. The form *–on* was also described in the context of the so-called 'crazy' antipassive, a term first coined by Kaufman (1990: 93, 1994, A 2a: 49) to describe antipassive marking in split ergative contexts. It is known to appear in several Mayan languages (Quesada 1997), but its morphology and semantics lacks a thorough study.

[344] This suffix can be considered as an antipassive when compared to the Ch'olan habitual in *–m-a* (see footnote 136), while *–Vj* in GQa often appears as a marker of derived intransitives.

[345] The example given is *š-in-č'ak'-w-i* 'COM-1SG.ERG-mojar-ANTIP-THEM' and translated as "[d]espués de lavar". As with the *–wi* intransitiviser in CHJ, the obligatory patient of the transitive verb is deleted, therefore we can consider this form as an antipassive. Refer to the examples given, where *–on* occurs, e.g. *k-al-on-i* '1PL.ERG-decir-ANTIP-THEM', translated as "[d]ecimos" (Zavala Maldonado 1992a: 67).

AKA	*-wi*	ANTIP < VER.TR	(Méndez Martinez 2004: 135, 185)
AKA	*-w-i*	ANTIP < VER.TR (absolute)	(Zavala Maldonado 1992b: 83, 274-276)
AKA	*-w(i)*	ANTIP < VER.TR (absolute)	(Zavala Maldonado 1997: 455)
AKA	*-wi*	ANTIP < VER.TR (incorporate)	(Zavala Maldonado 1997: 455)
AKA	*-w-i ~ -w-<>-i*	ANTIP < VER.TR (incorporate)	(Zavala Maldonado 1992b: 83-84, 275-276)[346]
AKA	*-wi ~ -wa*	ANTIP < VER.TR (demoting)	(Zavala Maldonado 1997: 456)
AKA	*-wa*	ANTIP < VER.TR (demoting)	(Zavala Maldonado 1992b: 88-89, 280-282)
AKA	*-wa*	ANTIP < VER.TR (patientmute)	(Zavala Maldonado 1992a: 229)
AKA	*-way*	ANTIP < VER.TR	(Akateka 2007: 198-199)
AKA	*-way*	ANTIP < VER.TR	(Méndez Martinez 2004: 135)
AKA	*-on*	ANTIP < VER.TR (agentive)	(Zavala Maldonado 1992a: 47, 48)
AKA	*-on-i*	ANTIP < VER.TR (agentive)	(Zavala Maldonado 1992b: 87-88, 278-280)
AKA	*-on(-i)*	ANTIP < VER.TR (agentive)	(Schüle 2000: 174-179)[347]
POP	*-i*	ANTIP < VER.TR [-$_{\text{PATIENT}}$]	(Popti' 2001: 245)
POP	*-w*	INTRS	(Stratmeyer et al. 1966: 213)
POP	*-w*	ANTIP < VER.TR (incorporate)	(Dayley 1990: 366)
POP	*-w*	ANTIP < VER.TR (incorporate)	(Ross Montejo and Delgado Rojas 2007: 43)
POP	*-wa*	ANTIP < VER.TR (absolute)	(Dayley 1990: 366)
POP	*-wah*	ANTIP < VER.TR	(Ross Montejo and Delgado Rojas 2007: 42)
POP	*-wa(hi)*	ANTIP < VER.TR (agentive)	(Popti' 2001: 246)
POP	*-wi*	ANTIP < VER.TR [+$_{\text{PATIENT}}$]	(Popti' 2001: 245)
POP	*-w(ih), -wah*	ANTIP < VER.TR	(Delgado Rojas et al. 2007: 140, 264)
POP	*-n(i)*	ANTIP < VER.TR (agentive)	(Craig 1977: 11, 212-216)[348]
POP	*-n*	ANTIP < VER.TR (agentive)	(Delgado Rojas et al. 2007: 140)
POP	*-n*	ANTIP < VER.TR (agentive)	(Dayley 1990: 366)
POP	*-n*	ANTIP < VER.TR (agentive)	(Kaufman 1994, A 4a: 42)
POP	*-n*	ANTIP < VER.TR (incorp., foc.)	(Dayley 1990: 366)
MCH	*-VVn*	ANTIP < VER.TR	(Martin 1990: 429, 432, 433, 435)[349]

Table 44: Greater Q'anjobalan forms for the derivational antipassive suffix.

The antipassive across all WM languages provides a very homogenous set of suffixes. With regard to test group 2, only the Greater Q'anjobalan (and to some extent Tzeltalan) branch provides concord with the epigraphic data worked out so far (Lacadena 2000a), if one follows the reconstruction by Kaufman (1994).

A combined diachronic and functional review of the ClM forms is still pending, but will at least be part of the –*(V)w* suffix as per the test case scope. Apart from that, the following propositions (after Lacadena 2000a, Mora-Marín 2001: 91-92) have been made for ClM: (1) absolutive antipassive –*(V)w*

[346] Besides postponing the object after the verbal stem, AKA also has the possibility of a true incorporation, as the following example (Zavala Maldonado 1992b: 84) demonstrates: *š̥-in-ʔuk'-w-an-i=an* 'COM-3SG.ABS-beber-ANTIP-licor-THEM-CLF', "[m]e emborraché (lit: yo tomé vino)." Apparently, the positioning is not entirely facultative, at least generic terms and animated patients must follow the verbal form (Zavala Maldonado 1992b: 275-276), as in *tš-Ø-ʔil-w-i noʔ nax šunik*, "Juan cuida animales."

[347] The verbal morphology of the suffix is almost identical to the one described for QAN (footnote 343), except that a nominal use is not described.

[348] Craig refers to the agent focusing as "clefting" and POP has a facultative "clefting element" (at least when the agent is full NP and not just a pronoun) *ha'* in sentence initial position (when the agent is 3SG). We e.g. also have 1SG *hayin* or 2SG *hach* (Craig 1977: 101). This is exactly the same as in ClM which requires an initial independent pronoun based on the demonstrative *ha'*, inflected with an absolutive pronoun, e.g. 1SG *hin*, 3SG *ha'i* or 3PL *ha'ob* (Hull, Carrasco and Wald 2009, Lacadena 2000a: 167, 170). However, POP in contrast only realises the antipassive suffix when the agent deleted was the third person (hence along with *ha'*), otherwise the ergative pronouns remains in place and even the transitive marker may stay in place (Craig 1977: 104, 128). An agent focusing antipassive might therefore only be realised with a third person agent.

[349] The examples for the antipassive are *Ø-qa-'ahl-iin-oo'+he* (from "trabajar"), *Ø-chah-oon* (from "encontrar"), *ch-'aaw-aan-qe'* (from "gritar") and *ch-Ø-b'iis-uun* (from "pensar"). The examples do not provide any conclusive evidence for a correlation of the suffix vowel with the root vowel.

with the patient removed among few *–(V)n* cases[350], (2) agentive antipassive *–(V)n* with the agent fronted and the object removed/unaffected for (non-)CVC roots and derived transitives among few *–(V)w* cases[351], and (3) object incorporating antipassive *–(V)w*.

While previous reconstructions for the antipassive (Kaufman 1994, Smith-Stark 1978) were not able to mirror the linguistics from the epigraphic data, we can now use them to refine the results of historical linguistics and attempt to better understand the development of antipassive forms. As a matter of fact, all epigraphic data point to a scenario alternative to Kaufman's reconstruction, more in accordance with Smith-Stark and also the Greater Q'anjobalan forms. As already mentioned, Kaufman is the model of choice for a couple of reasons, so it needs be modified to fit the epigraphic reality. Mora-Marín (2001: 276-277) made a first attempt, but while I agree with some observations, I would like to propose an extended scenario. Mora-Marín (2001: 271, fig. 8.6c) proposes that some of the earliest texts from the Late Pre-Classic feature an absolute/incorporation antipassive on **–(V)n*[352], as a reflex of the pM **–o-an* / **–an* form that became frozen in Ch'olan. It thus had to be present in pCh, yet, such a form / function is not reflected in Early and Late Classic texts. We furthermore have evidence (though rare) from Late Classic texts of an agentive antipassive *–(V)w* (see footnote 351), although William Norman (cited in Kaufman [1994, A 4a: 2]) considers it as likely not reflecting pM **–o-w ~ * –a-w-(an) / –w-(an)*. He assumes a generic pM intransitiviser **–(a)w* to have eventually developed from the root transitive status marker ~ **–o-w / …* without having a specific antipassive function. Antipassive reflexes of this suffix are supposed to be found in a geographical continuum spanning from

[350] One example is **i PAT=ni** < *i pat-[a]n-Ø*, "then he formed" on CPN Alt. S, I1b. No independent pronoun appears upfront and the following **QUATREFOIL IK'? TUN[ni] u-K'ABA'[a]** < *? u-k'aba'*, "*QUATREFOIL Ik'? Tun* (is) its name" provides the object, but in a new (stative) phrase. Mora-Marín (2001: 91, 95-96) cites the case of **u=CHOK=no=ma** < *u-chok-n-om* (CPN Mon. 157, C1) to be an incompletive antipassive with split ergativity. I doubt the case, as there is no evidence that the future participle *–om* (Schele and Grube 1988) goes along with split ergativity, compare to he well known examples of *u[h]t-om-Ø* (e.g. CRC Alt. 13, W3) or *tzu<Ø>tz-j-om-Ø* (e.g. YAX Lnt. 31, K5). But if *–om* is analysed as the common agentive (cf. Gronemeyer 2006b: 158, Kaufman 1994, A 3b: 34) in a possessive phrase, '3SGR.ERG-cast-ANTIP-AGN-3SG-ABS' translates as "he (is) a caster of [incense]", considering that the inscription is fragmentary and the possessed (*ch'aj*) could be broken off. Compare to other such agentive forms, such as CHL *aj-mäñ-oñ-el-oñ*, "soy un comprador" (Vázquez Alvarez 2002: 266).

[351] Compare **ha-i IL=ni=ya** < *ha[']-i-Ø il-n-Ø=iy* (PMT Mon. 11, Bp3), "[i]t is he who witnessed" (Hull, Carrasco and Wald 2009: 38) or **ha=i pi-ku-la JOY=ni=ya AJAW** < *ha[']-i-Ø pikul joy-n-Ø=iy ajaw* (TRT Mon. 6, L3-K4), "it (was) him who invested many lords" with **ha=i TZAK=wi=ya 18 u=BAH CHAN=nu OCH-K'IN[ni] KALOM-TE'** < *ha[']-i-Ø tzak-w-Ø=iy waxaklajun u-bah chan-u[l] ochk'in kalomte'* (CPN St. 6, C4y-C7), "it (was) him, the West *Kalomte'*, who conjured *Waxaklajun Ubah Chanul*".

[352] These forms are supposed to represent a late pre-pCh or early pCh form (Mora-Marín 2001: 276-277). The basis for this assumption are several cases of the **BEARDED.GOD.N=ni** collocation appearing in phrase initial position (e.g. SBT Pinturas sub-1A W Wall, A1 or COL Stone Jaguar YPM ANT 236866, A1). It is reasonable to assume that we deal with a verbal statement by syntactic considerations, although the sign remains undeciphered. But several caveats can be made against this hypothesis: (1) comparison with other occurrences show a broad stylistic variety, the supposed **ni** could be part of the **BEARDED.GOD.N** sign or (2) it serves as a phonemic complement (although unlikely considering the dating). Furthermore, we cannot prove the function of **ni** to indicate an antipassive, as we lack sufficient understanding to interpret the rest of the syntax and isolate the agent and possibly the incorporated object from the blocks to follow.

TZO to MAM (where it is likely an innovation). It is only the Ch'olan family in the WM branch to miss it in this function, although there is evidence for it in the *–*w* intransitiviser of positional roots[353].

I assume that a reflex of this intransitiviser shifted to the absolutive antipassive function in pGT (or even earlier) as an innovation, as Tzeltalan preserves it and apparently pCh inherited it[354]. Potentially, it was in use some time along with a form I reconstruct as *–*on* in pre-pCh, but not after pTz split off the pGT branch, as it is absent from Tzeltalan. The suffix then got frozen in Ch'olan as the absolute antipassive. The original pM *–*(a)w* form still served as the agentive antipassive in pre-pCh and as a reflex for some time in ClM, before it disappeared from the Ch'olan branch entirely. This also means that ClM exhibits some conservatism while the reflex of this pGT *–*(a)w* intransitiviser as the absolute antipassive came out of use in Ch'olan, ideally before the split into WCh and ECh. At the same time, the incorporation antipassive we still find in ClM had to disappear with this suffix as well from the spoken language.

How probable is the use of such polysemantic allomorphs? Most EM languages except GKi (which reflects more the pM forms) have the absolutive and agentive antipassive marked with the same suffix, mostly *–*(V)n*, while e.g. PCH has *–w* ~ *–in* (Kaufman 1994, A 4a: 1). That a combination and later diverge of form and function also happened in the WM branch is not unlikely. The final question concerns the embedding of the Greater Q'anjobalan branch. As stated above, the agentive is supposed to have been lost in WM, only to be innovated with *–*on* after 500 AD in CHJ, according to Kaufman (1994, A 4a: 6), from where it spread to TZO and caused the Greater Q'anjobalan redistribution of functions between *–*(V)w* and * –*(V)n*. We can still assume the process described above, but then the loss of the pM agentive *–*(a)w* antipassive should not have taken place in pWM, but in pGQ. As the MCH data show, it is reasonable to assume that pGQ retained the pM absolute antipassive via pWM and that the innovation appeared only after MCH split off, as it is not affected by the redistribution. The function shifting then took place in pQa from where it diffused to pCT and from there to TZO.

This seems most reasonable facing the evidence from ClM. If the scenario proposed by Kaufman (1994, A 4a: 1-8) would be true, an appearance of the redistributed functions in ClM could only be explained by two unlikely scenarios: (1) pGT had the same process of innovation and redistribution independently from pGQ, or (2) we find diffusion into ClM only from Greater Q'anjobalan as well, but both the temporal and spatial dimension make it questionable. Nevertheless, we can agree with Kaufman that the situation in the WM branch is the result of several innovations and redevelopments resulting in the switch of forms and functions.

While the antipassive has not received a broader diachronic review in the epigraphic record, the recognition of changing derivational patterns in the inscriptions might be able to further refine the

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[353] The reflex of *–*(a)w* as an antipassive can clearly attributed to the absolute/incorporating functions in Tz and GQa (Tables 43 and 44). I however doubt that *–*w* is a different suffix (Kaufman 1994, A 4a: 3), considering the close relations between positional and transitive roots (see footnotes 68 and 431).

[354] Such shifts in function may also have occurred with reflexes of the absolutive antipassive, which Kaufman (1994, A 4b: 2) assumes to have become the mediopassive in some languages, e.g. in TZU and WAS. MCH likely also would belong here (see footnote 386).

historical development within WM in general and the Ch'olan branch in particular. The objective of this study to analyse epigraphic samples with a broad variety of parameters (see Chapter 2.3.1.1) allows the tracing of such developments.

The closest evidence for the ClM antipassive comes from the Greater Q'anjobalan branch and to some extent from Tzeltalan. Ch'olan actually does not feature comprehensive proof for the ClM forms, except the few cases where we can isolate an absolute antipassive on *–(V)n* (see footnote 350). The linguistic data from Greater Q'anjobalan rather disprove the assignment of the *–(V)w* allomorph as a test group 2 case, as these are all following a *–w* or *–wV(C)* pattern (Table 44). Only Tzeltalan (Table 43) occasionally features an initial vowel, but again, its antipassive suffix is not purely a *–VC* pattern.

Besides some linguistic support, it is the epigraphic evidence itself that provides support that the ClM antipassive suffix was basically vowel initial, and most likely *–V_1w / –V_1n* root harmonic among root transitives. We see the same process of sound change from a fixed to a harmonic vowel as observed with the root transitive marker (Chapter 3.1.3.1) and the perfect suffix (Chapter 3.1.7), therefore I assume pre-pCh **–aw / *–on* > pCh **–V_1w / *–V_1n* > ClM **–V_1w / *–V_1n*. Good evidence comes from syllabic spellings that follow the proposed group 1 vowel-providing scheme[355]. These also testify that in the case of the incorporating antipassive, the object follows the suffixed verb[356], as already noted by Lacadena (2000a: 162) for graphemic compounds. Additional patterns may apply, e.g. the *–(V_1)w-i* pattern which several scholars proposed for the indication of the intransitive completive (see Chapters 2.1.2.1 and 3.1.4.1), a possibly syncopated *–w=iy / –n=iy* with the temporal deictic enclitic attached, or

[355] See e.g. **jo-lo=wo** < *jol-ow-Ø*, "he opens" (CML Urn 26 Pdt. 10, A7) or **la-ma=wa EK'** < *lam-aw-Ø ek'*, "the star sank" (K7720, B2; part of the nominal phrase of *K'inich Lamaw Ek'* of Rio Azul). More abundant are those cases of antipassive nominal phrases (Colas 2004: 103-112), e.g. **u-k'u=wi** < *uk'-uw-Ø* (e.g. DBC St. 19, A2 as part of *Uk'uw Chan Chak*), **ti-li=wi** < *til-iw-Ø* (e.g. NAR St. 13, H10 as part of *K'ahk' Tiliw Chan Chak*) or **ja-sa=wa** < *jas-aw-Ø* (e.g. TIK St. 16, B3 as part of *Jasaw Chan K'awil*). As the roots are all synharmonic, we could assume the indication of a C-C border (see footnote 37), e.g. as **til-w-i-Ø* rather. While this would follow more the linguistic data (at least from the GQa branch), further evidence for a *–V_1w* pattern comes from morphographic spellings with phonemic complements, such as **i PAT-ta=wi** < *i pat-aw-Ø* (QRG Alt. M, A4), where the additional syllabogram likely serves to provide the suffix vowel. This is however not final proof for a *–V_1w* pattern. But spellings with **wa** substituting for **wi** actually do not strengthen the assumption that either *√-w-i* or *√-w-a* were intended within the same syntactic environment (if *–i* was a completive marker). Syncopation nevertheless may occur when other suffixes follow, e.g. **TZAK=wi=ya** < *tzak-w-Ø=iy* on CPN St. 6, C5. The case of *i pat-aw-Ø* on QRG Alt. M is also notable for another morphosyntactic detail: the incorporated object **u=ALTAR-TUN^{ni}** is possessed by the verb's agent, Quirigua ruler *K'ahk' Tiliw Chan Yo'at* (bearer of another antipassive name phrase). Although not part of the test group, the agentive antipassive in ClM can also likely be assumed to be *–V_1n*, as the example of **i PAT^{ta}=ni** < *i pat-an-Ø* (RMC Plaque, H1), again the complement serves to provide the vowel.

[356] This is therefore different than e.g. the object incorporation in Yukatekan (see footnote 332). As an incorporating antipassive is possibly non-existing in Ch'olan (see footnote 323), we have to compare with GQa evidence, which indeed follows the same pattern of VER.TR+ANTIP$_{pred}$ NOUN$_{obj}$ (NOUN$_{subj}$), e.g. CHJ *tz-in-man-w nha*, "compro casa" (García Pablo and Domingo Pascual 2007: 253) and QAN *chi-Ø jutx'-w-i kawej ix*, "[e]lla muele masa" (Q'anjob'al 2005: 183). Whether the cases of the antipassive nominal phrases cited above are able to support this sequence might be questioned. Names such as *Uk'uw Chan Chahk* have been taken as incorporating antipassives (Colas 2004: 110-111), translating "*Chahk* Sky-Drank". More complex names such as *K'ahk' Tiliw Chan Chak* then would expose several grammatical issues. I rather assume an absolute antipassive introducing a subordinate clause in which an element preceding the proper name of a god is rather part of the theonym, hence I would translate the name of the Naranjo ruler as "Fire it was that the Heaven-*Chahk* Burned". A comparison with multipartite passive names (Colas 2004: 123-126) shows that with one exception (*k'inich*) we always have the combination *chan*+god name. It is the same pattern as with antipassive names (Colas 2004: 108). But because of the antipassive, *chan* has to be part of the grammatical subject and thus the theonym.

for a further derived form[357] (Law 2006: 68-69). The determination just by the epigraphic evidence is delicate, in a **CV_1=wi / CV_1=ni** spelling **CV_1** may not only be used to provide the vowel harmonic suffix vowel in an integrative spelling, but in a root synharmonic spelling may also indicate suffix syncopation (see footnote 37). Cases with a morphographically spelled root and an additional syllabic sign can be interpreted in favour of a vowel-providing spelling.

In the case of derived transitives, I suggest that the pM **–an* was phonologically inherited through to ClM **–an* agentive antipassive. It is difficult to judge whether the absolute / incorporating antipassive in ClM was just **–w* or **–aw*. Parallel to MacLeod's (2004: 296, 311, 316-317) proposal for the perfect suffix (Chapter 3.1.7), I assume vowel assimilation (but suspending lengthening) with the vowel of the preceding derived transitive thematic or transitiviser, which gests elided / syncopated. Therefore an underlying **CVC-(C)V-an* / **CVC-(C)V-(a)w* is realised as *CVC-(C)-Vj* / *CVC-(C)-Vw*[358]. The assimilated vowel is not root harmonic, but determined by the underlying suffix vowel, hence ***–en* / ***–ew* and ***–on* / ***–ow* do not occur with derived transitives. With *–VC* transitivisers, e.g. the causative *–es*, the underlying form is expected.

Based on the linguistic evidence that antipassives do not require a thematic / status suffix[359], this is likely not the explanation of the abundant **CV_1=wi** / __# and **CV_1=ni** / __# spellings already noted by

[357] This may be true for some forms with an ergative pronoun. The spelling **u=CHOK=wi** (NAR Alt. 1, K9) cannot be transitive (with **wi** assumed to indicate the root transitive marker), as it directly follows *u[h]t-om*, "it will happen" that binds this expression and the following name of *Aj Wosa[l]* as its subject (in a possessive phrase). Therefore, the presence of the ergative also cannot be taken as evidence for split ergativity on an incompletive antipassive. Law (2006: 68-69) cites a CHT suffix *–i* that he interprets as a transitiviser by the phrase <*Maca uyalaui u bactal caua auil Jesu Xp̄to tu xelpahel*>. While such a transitiviser has not been described, we also may infer (although likewise unattested) a nominaliser *–i* which would provide a nested possessive phrase "Is it not a hurting of the body of our Lord Jesus Christ when [the bread] is in its breaking?" Thus, we could analyse the Naranjo case as *u-chok-w-i*, '3SG.ERG-scatter-ANTIP-NMLS' and translate "the scattering of". Even without such a suffix, we can construe a nominal form from the spelling with a –Ø nominaliser (see footnotes 96, 333 and 324). The **wi** sign continues to serve as a visual marker for an underlying antipassive, thus *u-chok-[o]w-Ø* can still be analysed the same way. A case like **u=K'AL=wi TUN**[ni] (CRC St. 13, A16) can also be understood as a root transitive verb phrase *u-k'al[-a]-Ø tun* (where **wi** is used instead of **wa**), as it binds the following *k'uhul k'antumak* (the Caracol 'emblem glyph' [Beetz and Satterthwaite 1981: 115]) as the agent. A nominalised form *u-k'al-w-i+tun-Ø* / *u-k'al-[a]w-Ø+tun-Ø* only functions as a compounded noun "the stone-binding of" to work within a possessive phrase, but seems possible (compare to footnote 324 and nominalised antipassives like *u-ch'am-Ø+k'awil-Ø*). The suspected *–i* nominaliser may relate to *–ij* in ClM, as it has been proposed by a couple of authors (especially for nominalised antipassives, see footnote 74). The stone-binding expression may appear both as a transitive verb and an object incorporating antipassive in the epigraphic record, but if we had an *–i* / *–Ø* nominaliser in the inscriptions, it might be the preference for this analysis, as it would provide scribal intent for an otherwise ambiguous or aberrant spelling with **wi**. For this, also compare to CPN Alt. Z, D3, the subject following the supposed ECh / CHR antipassive (see footnote 71) as **u=pa-ta=bu=hi.** It has to be a nominal form and can be analysed as *u-pat-bu-hi*, "his shaped [object]". The /h/ would take the role of an epenthesis in this case for the supposed *–i* nominaliser to avoid a vowel hiatus. Similar is **u=PAT=na=hi** < *u-pat-[a]n-(h)i* on CNC P. 1, M5, although no epenthesis is needed here. Another instance might be **NAH CHOK**[ki?] < *nah chok-i-Ø*, "it is the first scattering" (TRT Frg. 1, pE1), if one follows Grube (cf. Mayer 1995: 73-74) that the sign SCC is used as a syllabic sign **ki** here instead of its usual morphographic reading **CHAM ~ KIM**.

[358] Compare to footnote 492 and the transitivation of positional roots by means of the causative *–bu* suffix. For example, NAR K1398, A5-B5 has the agent-focusing **PAT**[ta]**=bu=ni=ya** < *pat-b-un-Ø=iy*, with the underlying form ***pat-bu-an-Ø=iy*. This example also makes it less likely, that the antipassive among derived transitives undergoes syncopation when suffixes, e.g. the temporal deictic enclitic, are following.

[359] This again evokes the question of the aspect of choice and split ergativity in the inscriptions. Generally, we observe no ergative pronoun. Thus, we deal with the completive aspect when accepting split ergativity for ClM (see footnote 439). The linguistic evidence from GQa languages shows that *–wi* does not only appear in the com-

Lacadena (2000a: fn. 7). This also argues against single consonant morphemes. In the line of evidence with the root transitive marker, I second Lacadena that **wi** served as a “specialized sign for this kind of construction.” We may infer the same ‘visual marker’ function for **ni** to mark the agentive antipassive. There seems to be no evidence that changes between **wi** and **wa** are (morpho)phonologically conditioned, they may freely exchange in identical contexts[360]. Of course, we have alterations of syllabograms when suffixes follow, as with the **CV-CV=no=ma** spellings of future participles and agentive nouns. Because of its appearance in Ch’olan (with only limited productivity in WCh) and Tzeltalan, we can also determine **CV=ma / __#** and **Co=ma-ja / __#** as an antipassive spelling.

An absolute antipassive in a Yukatekan vernacular context would likely appear as a **=na=ja / __#** sequence, similar to the Ch’olan pattern of the passive derived transitives. Two features will disambiguate it from the passive: the suffixation to a root transitive verb and the deletion of the patient rather than the agent. In a Tzeltalan context, the absolutive antipassive can be predicted as **(Ca)=wa-nV / __#** to reflect *–(a)wan*, the agentive antipassive as **Co=ni / __#** to reflect the fixed vowel suffix *–on* while at the same time retaining the visual marker **ni**. All these patterns would differ considerably from the general Ch’olan patterns.

Branch	Paradigm	Spellings	Schemes
Common Ch’olan	√-V_1w	**CV$_1$-CV$_1$=wi / CV$_1$C-CV$_1$=wi**	1.a,d.i,ii
		CV$_1$C=V$_1$-wi	1.e.i
	√-$[V_1]w$	**CV$_1$-CV$_2$=wi / CV$_1$C(-CV$_2$)=wi**	2.b,c.i,ii (2.e.i,ii)
	√-C_d-V_dw	**CV$_1$-CV$_1$=CV$_d$=wi / CV$_1$C=CV$_d$=wi**	1.a,b,c,d.i,ii

pletive aspect and may there occasionally freely exchange with *–wa* (e.g. in AKA [Zavala Maldonado 1997: 455-457]). Of course, Ch’olan evidence would be more reliable, but we have to accept that it can only provide evidence for the frozen *–(o)n* suffix. CHL withdraws, as its antipassive is a nominal form. CHN has indeed *–n-i* / __# [+COM], but antipassives are generally inflected like inchoatives (Knowles 1984: 150, also see Table 16) and cannot really compare. CHT has no firm evidence for antipassives. CHR does not require a thematic suffix / ANTIP__#, compare to these completive examples: *e winik tihr-s-an-Ø*, “the man ruined” (Quizar and Knowles-Berry 1988: 90) and *[e] winik k’ayon akb’i ke’ ma’chi lok’oy upatna’r*, “[t]he man scolded yesterday because his work didn’t turn out well” (Hull 2005: 70). Taking the examples from footnote 355, the antipassive nominal phrases are thus formulated in a completive aspect. This seems to be in general accordance with other nominal phrases involving other intransitive predicates like passive and affective forms (Colas 2004: 113-141) that do not show ergative pronouns or incompletive status suffixes. We nevertheless would intuitively take such sentence names as a present tense statement with a general(ised) meaning. This does not necessarily has to be true for other cultures. Egyptian sentence names (Ranke 1935-77, II: 30-88) feature several verbal forms. Names following the *sḏm.n=f* paradigm (for the past tense [Gardiner 1957: §§ 67, 212) are rare, but attested from the Middle Kingdom on (Ranke 1935-77, II: 40-41), e.g. *mȝȝ.n=j ỉmn*, “ich habe Amon gesehen” (‘I have seen Amun’) or *gmj.n=s ḥr*(*.w*), “sie hat den Horus gefunden” (‘She has found Horus’). To a lesser degree, sentence names with the stative *Pseudopartizip* (termed “old perfective” by Gardiner [1957: § 309]) also belong to this. As this finite verb form is resultative, it can express past tense, especially with verbs of motion (for Middle Egyptian cf. Gardiner [1957: § 311], for Late Egyptian cf. Junge [2008: 86]), e.g. in the name of Great Royal Wife *Nefertiti* as *nfr.t ỉi.tj* (Ranke 1935-77, II: 63), ‘die Schöne (eine Schöne ?) ist gekommen” (‘The [a?] Beauty has come’). Colas (2004: 112) considered antipassive nominal phrases as an onomastic carrier to characterise the king as an acting god, but with a completive aspect we may also infer that this was restricted to a specific event, namely the accession as a *rite de passage* (Eberl and Graña-Behrens 2004: 104-105, Le Fort 2000), where divine status was acquired (Colas 2003: 270). Also refer to the sociolinguistics of Amharic names (Leyew 2003) which include a broad variety of verbal forms (including past tense) to reflect an individual reasoning for a name (like events related to the birth, etc.), e.g. *fät’t’änäčč*, “she became fast”.

[360] And even within the same inscription, compare **KAL=wi TUN** (TIK St. 31, D18) with **KAL=wa TUN** (TIK St. 31, F16) < *kal-[a]w-Ø tun*, “he stone-bound”.

	√-[V_S]w	**CV_1-CV_2=wi / CV_1C(-CV_2)=wi**	2.a,b,c,d.i,ii (2.e.i,ii)
	√-V_1n	**CV_1-CV_1=ni / CV_1C-CV_1=ni**	1.a,d.i,ii
		CV_1C=V_1-ni	1.e.i,ii
	√-[V_1]n	**CV_1-CV_2=ni / CV_1C(-CV_2)=ni**	2.b,c.i,ii (2.e.i,ii)
	√-C_d-V_dn	**CV_1-CV_1=CV_d=ni / CV_1C=CV_d=ni**	1.a,b,c,d.i,ii
	√-[V_S]n	**CV_1-CV_2=ni / CV_1C(-CV_2)=ni**	2.a,b,c,d.i,ii (2.e.i,ii)
Eastern Ch'olan	*√-ma*	**CV_1-CV_1=ma / CV_1C(-CV_1)=ma**	-
Western Ch'olan	** √-(o)n*	**CV_1-Co=ni / CV_1C(-Co)=ni**	1.a,d.i,ii (2.e.i)
	** √-n-i*	**CV_1-CV_1=ni / CV_1C-CV_1=ni**	2.f.i
Yukatekan	** √-n-aj*	**CV_1-CV_1=na=ja / CV_1C(-CV_1)=na=ja**	1.f.ii
Tzeltalan	** √-awan*	**CV_1-Ca=wa-nV / CV_1C-Ca=wa-nV**	1.a,d.i,ii
	** √-(a)wan*	**CV_1-CV_1=wa-nV / CV_1C(-CV_1)=wa-nV**	2.b,c.i (2.e.i)
	** √-(o)n*	**CV_1-Co=ni / CV_1C(-Co)=ni**	1.a,d.i,ii (2.e.i)
	** √-(o)maj*	**CV_1-Co=ma-ja / CV_1C(-Co)=ma-ja**	1.a,d.i,ii (2.e.i)

Table 45: Representative, linguistically induced spelling patterns on junctures to be expected for the derivational antipassive suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.4 – Control Group 2

3.1.4.1 – Mediopassive Suffix –V_1y ~ –Vy, Intransitive Marker and Versive Suffix –Vy

The discussion of the ClM *–V_1y* suffix that occurs with intransitive verbs evokes a multidirectional approach. What is actually referred to as the 'mediopassive' is a conglomerate of different suffixes and has been defined quite differently in the past. To make allowance for both the phonology and the function, we need to trace the development of: (1) the plain status / thematic suffix of (root) intransitive verbs from pM ** –i(-k) ~ * –i-h* (Kaufman 1994, A 3a: 1, 8, 12), (2) the proper mediopassive from pM *<*h*> (Kaufman 1994, A 4a: 40, 45-46), (3) the versive from pM *–*er* (Kaufman 1994, A 4b: 41, 51) and (4) several celeritives on *–*C* (Kaufman 1994, A 4b: 41, 52-55).

Of the relevant languages for this study, a reflex of the pM plain ** –i(-k) ~ * –i-h* is retained in Ch'olan, Yukatekan and some Greater Q'anjobalan languages as *–i* or *–i(y)*. The development and usage of the regular root intransitive marker was at length discussed by Mora-Marín (2001: 271-272) and Wald (2007: 246-267, 927) whom I largely follow. Kaufmann (1994, A 3a: 12) assumes that from the two pM allomorphs, "[o]nly *–i-h (or *–i-V) can account for Mam –ii, Toj –iy and Chj –i(y)". If this would be the case, pCh had to count as well, as we find *–V_1y* suffixes as root intransitive markers in ECh (Kaufman and Norman 1984: tab. 13). I however propose a different scenario. Intransitives in ECh are classified by their thematic suffix, certain roots take a specific suffix which is mutually exclusive for each of the classes. For CHT, this *–i ~ –e* vs. *–Vy* (Fought 1984: 52-53). Sattler (2004: 368) attests the majority of intransitives to take *–Vy*. For CHR, Fought (1967: 176, 182) separates into several *–V* types (called /A, /E, /I, /O, /U base class) and *–Vy* (called /VI base class). The linguistic data (Table 46) show that from *–V*, the allomorphs *–i ~ –e* / CeC__# are the most common. Moreover, CHL also features additional *–Vy* forms with intransitive verbs of motion and change of state (Mora-Marín 2009: tabs. 9-10), but these are derivational.

I generally agree with Mora-Marín (2009: 141) that such a $-V_{(1)}y$ form in CHT, CHR and CHL (which is not always root harmonic) may in fact derive from the pWM **–ey* (with WM shift [r] > [y]) < pM **–er* versive. This at the same times means that pM ~ **–i-h* was not the origin of this suffix, as Kaufman assumed. The other languages he considers to feature a reflex interestingly also belong the 'Huehuetenango' sphere already mentioned in connection to the antipassive (Chapter 3.1.3.2). The only exception is Tzeltalan, but the *–Ø* marking of intransitives here is analogue to those of root transitives (see Chapter 3.1.3.1).

What exactly does the conundrum of the $-V_1y$ marker represent then? I largely concur with Mora-Marín (2009: 138-145) and Wald (2007: 268-311) concerning the reconstruction and development of the suffix, as it was originally proposed by Houston, Robertson and Stuart (2000: 330-333, fig. 4). Kaufman's pM **–er* versive/inchoative at the latest became *$-V_1y$ in pGT < pWM **–ey* (and **–iy* in pGQ with [e] > [i] shift). Of particular interest is the further functional shift between and within pCh and pTz. The pTz *$-V_1y$ (as an intransitiviser for several root classes [Mora-Marín 2009: 140]) became TZO passive *–ey* (Table 8) and TZE inchoative (Table 18), as well as the Colonial TZE assumptive $-V_1y$ (Table 13). We have already ascertained the shared features and semantics between the passive, the assumptive and the inchoative (see Chapters 3.1.1.2 and 3.1.1.3, footnote 172).

In pCh, the function of this suffix narrowed from a 'general versive' to a specific intransitiviser of transitive roots on the one hand, a function that surfaces in ClM as the 'mediopassive'. We can only inductively define the mediopassive as a valency decreasing mechanism in ClM by the epigraphic evidence (see Wald [2007: 288-297] for showcases) while we have to semantically demarcate it from the passive[361]. Therefore, a shared marking in pGT between positional and transitive roots is explainable (Wald 2007: 287-288) without the necessity to proclaim a functional shift from passive to mediopassive (cf. Houston, Robertson and Stuart 2000: 331, fig. 4, Hruby and Robertson 2001: 34-36, Robertson 2010: 9, 11-14)[362].

[361] A mediopassive verb can be described as syntactically active, but semantically passive. It binds the grammatical subject as its single argument (intransitive), but the subject is the patient at the same time, because it succumbs to the action (whereas the passive's grammatical subject is affected by the action's result). Compare to the reflexive positional form in TZE in footnote 183, where a stative positional receives an intransitive meaning. Kaufman (1994, A 4a: 40) defines mediopassives as "verb forms [that] do not occur with an oblique Agent. Mediopassive refers to an event that occurs without any agency assignable or revealed by the speaker." These definitions show the close semantic relation (Wald 2007: 286-287) to intransitive positionals (also see Chapter 3.1.1.3): it is the grammatical subject itself that got into a state/position, in contrast to the transitive/portative where the agent causes the patient to become into position. This relation is also plainly shown in the term 'anticausative' (Nedyalkov and Sil'nickiy 1969: § 10) sometimes used for the 'middle' voice (as another term for the mediopassive in certain grammatical traditions), although this mingles several diatheses (cf. Alexiadou and Doron 2012: 5)

[362] Specifically, as we have contemporaneous examples of the mediopassive and the passive, even with the same verbal root and the same inscription (Wald 2007: fig. 123), e.g. *tzutz* on CPN St. J. These diatheses accentuate different semantics of the action (Alexiadou and Doron 2012: 26-29). While a passive is possible with every transitive verb, we do not know from the epigraphic record if the mediopassive was restricted to (or at least preferred with) certain transitives (which seems likely [Haspelmath 1987: 13] with limited lexical generality), as we lack alternate passive forms. We cannot securely tell if the preference in a text for one of these forms is grammatical or semantic, the latter chosen as a stylistic device (Wald 2007: 285). Additionally, an evolutional relation between the mediopassive and the passive is a proposition for Indo-Germanic (Schwyzer 1939-71, II: 236) and some other languages (Alexiadou and Doron 2012: 2) which claim the reverse process rather, i.e. from mediopassive to passive.

The question whether ClM on the other hand in addition features the mediopassive with intransitive roots cannot be securely answered yet (see Wald [2007: 297-303] for showcases), but seems likely. As stated above, we find the suffix in question with root intransitive verbs in modern Ch'olan languages. Mora-Marín (2009: 140-45, tabs. 9-10) ties it to specific intransitives as a (completive) status marker of verbs of motion and changes of state. This dual function is only an ostensible contradiction. The mediopassive is more a pool to describe different functions (cf. Haspelmath [1987: 9-10] who also includes the inchoative in his discussion of 'anticausatives' as the generic term)[363]. Besides a typological view, grammars actually prove that the mediopassive can either be inflectional or derivational (cf. Anderson [1989: 10] on Ancient Greek)[364].

The evidence from modern languages actually proves the dual inflectional function of root intransitives. In ECh, we find the status markers *–el* [+INC] and *–i* [+COM] for 'regular' intransitives and *–el* [+INC] and *–Vy* [+COM] for 'mediopassive' intransitives (Kaufman and Norman 1984: tab. 13)[365]. The CHL evidence is similar, although Mora-Marín (2009: 140-45, tabs. 9-10) mingled together several cases in his overview. Among CHL intransitives, we can distinguish those who directly bind a semantic patient to the root (Vázquez Alvarez 2002: 36-39), they inflect with *–el* [+INC] and *–i(y)* ~ *–ʌ(y)* [+COM], as in ECh these indicate change of state and motion[366]. The other verbs (Vázquez Alvarez 2002: 40-43) utilise an inflected auxiliary verb plus the intransitive root, while few verbs allow both constructions.

Reflexes of the *–V_1y* intransitiviser are not grammatically described in ECh, but for CHL[367]. Here, we can identify *–Vy-el* [+INC] and *–Vy(-i)* [+COM], i.e. the derivational suffix is suffixed by the status marker[368]. Since *–V_1y* does not function as an intransitiviser in ECh, these languages apply a variety of *–C-a(j)* suffixes for the 'mediopassive' change of state as a reflex of several pM *–*C* celeritives

[363] In his discussion of 'verbs of motion', Beliaev (2006) quotes Wichmann who, in 2002, contrasted 'unaccusatives' vs. 'unvergatives'. Unfortunately, further detail on Wichmann's line of argument is not provided.

[364] Hence, 'anticausative' was chosen as the overarching concept to subsume different functions. Consider that 'causative' from a typological view (Haspelmath 1987: 3-4) can be distinguished into morphological transitivity alterations (marked by grammatical morphemes, as common in Mayan languages) and lexical transitivity alterations (different lexemes for transitivity/intransitivity). The latter has not concisely been discussed for Mayan languages so far, but cases are known, e.g. CHR VER.INTR *we'* vs. VER.TR.R *k'uxi*, "eat"(Hull 2005: 77, 112). The same is hence also true for 'anticausatives' (cf. Haspelmath 1987: 10-11), we therefore have derived 'anticausatives' – or mediopassives in Mayan terminology – and lexical 'anticausatives'.

[365] For example CHT *tal-i-en*, "I came" and *c'ot-oi-et t-uy-otot*, "[y]ou arrived at his house" (Fought 1984: 48).

[366] See footnote 374 on the morphophonemics. Vázquez Alvarez (2002: 353-353, 354) provides a list of some of these verbs (compare to those for CHR and CHT [Wald 2007: figs. 116-117]), e.g. *mi k-yajl-el*, "[m]e caigo" and *tyi yajl-iy-on*, "[m]e caí" as well as *tyi wäy-iy-oñ*, "[d]ormí" (Vázquez Alvarez 2002: 36, 44) with *wöy-öy-on*, "ya dormí" (Schumann Gálvez 1973: 26). Note that *yajl* is a lexicalised intransitivation (Wald 2007: fig. 113), therefore *–iy* cannot be derivational.

[367] For example *ʌch'uniyel*, "recinar" < *ʌch'uña*, "rechinando" (Aulie and de Aulie 1978: 6), *pʌntiyel*, "convertirse en" < *pʌntesan*, "transformar" (Aulie and de Aulie 1978: 70) or *yʌsiyel*, "descomponerse" < *yʌsan*, "dejar caer" (Aulie and de Aulie 1978: 122). The intransitivising function is not restricted to transitive verbs, but also to other lexical classes, closer to the pGT 'general versive' or the typological 'anticausative', e.g. *saliyel*, "padecer sarna" < *sal*, "roncha, sarna" (Aulie and de Aulie 1978: 80) or *colemʌyel*, "criarse" < *colem*, "grande" (Aulie and de Aulie 1978: 15).

[368] Compare to *ñajʌyel*, "olvidarse" and the completive phrase *tsa' ñajʌyi i cha'an jini junta*, "[s]e le olvidó la junta" (Aulie and de Aulie 1978: 62). The proof for *–ʌy* to function here as a derivational suffix from the transitive *ñajtesʌn* is the final *–i* as the intransitive status marker / __-3SG.ABS [+COM] (rather than a completive aspect marker as CHL uses aspect prefixes, cf. Wald [2007: fig. 114]).

(Kaufman 1994, A 4b: 41, 52-55). The ECh *–t* has to be taken as an innovation. Their existence in CHN must remain speculative (see footnote 373), as CHN does not feature any *–*V_1*y* intransitiviser. Following the ECh paradigm, *–a(j)* represents the thematic of derived intransitives (see Chapter 3.1.1.1). This alternates with *–i* in case of other derived intransitives which have a completive status marker *–Ø* to follow (see footnote 127). This has important implications for the spelling and analysis of the ClM *–*V_1*y* suffix (see below) and also the reconstruction of pCh. I therefore assume pCh intransitive status markers as **–el* [+INC] for both kinds of intransitives and **–i* / * *–*V_1*y* [+COM] for root / mediopassive meaning intransitives. In case the mediopassive functions as an intransitivation, we get * *–*V_1*y-el* [+INC] and * *–*V_1*y-i* [+COM]. As pCh shows a broad concordance with ECh derived intransitives (see Chapter 3.1.1.1 and footnote 127), the *–i* shall be interpreted as a thematic suffix, also to be retained in case other suffixes follow.

Finally, the pM *<*h*> mediopassive is retained as <*h*> in CHL where it is eventually non-productive. In all four Ch'olan languages, the pM *<*h*> finds its reflex in the <*h*> passive (see Chapter 3.1.1.1), which is also in use in CHL. Wald (2007: fig. 113) terms the CHL cases "[q]uasi [r]oot [i]ntransitives" and considers them as fossilised passive stems, rather than mediopassives[369], inflected as root intransitives.

Idiom	Attestations		Sources
pCh	*-*p-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	*-*tz'-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	*-*k'-{i,u}j*	CEL < VER.TR.R	(Kaufman and Norman 1984: 109)
pCh	*-*el*	VER.INTR.R [+INC]	(Kaufman and Norman 1984: 102)
pCh	*-*i*	VER.INTR.R [+COM]	(Kaufman and Norman 1984: 102)
ECh	*-*p-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 161-162)
ECh	*-*tz'-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 160-161)
ECh	*-*k'-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 159-160)
ECh	*-*t-aj*	MED < VER.TR (state-change)	(Storniolo 2008: 158-159)
ECh	*-V_1*y*	VER.INTR.R [+COM]	(Kaufman and Norman 1984: tab. 13)
ECh	*-*i*	VER.INTR.R [+COM]	(Kaufman and Norman 1984: tab. 13)
CHT	*-p-a*	MED < VER.TR	(Sattler 2004: 377)
CHT	*-p-a(h)*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHT	*-pa(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-c'-a-*	MED < VER.TR	(Fought 1984: 55)
CHT	*-¢'-a(h)*	PASS < VER.TR.R	(MacLeod 1987: fig. 8)
CHT	*-tz'a(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-k'-a(h)*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHT	*-k'a(h)*	MED < VER.TR	(Robertson, Law and Haertel 2010: 164)
CHT	*-t-a-*	MED < VER.TR	(Sattler 2004: 378)
CHT	*-i, -a, -e, -o*	VER.INTR THEM	(Fought 1984: tab. 3-3)
CHT	*-a-el*	VER.INTR.R [+INC]	(MacLeod 1987: fig. 4)

[369] As a passivation is patient focused, a lexicalised passive does not fit the semantics of the lexicalised form, compare VER.TR *cuy* in *mi' cuy i bʌ ti rico*, "[f]inge ser rico" with VER.INTR *cujy* in *mi' cujyel ti rico*, "[f]inge ser un hombre rico" (Aulie and de Aulie 1978: 17, 18). I second Kaufman to consider these verbs as lexicalised mediopassives, based on the verb *ujt-i*, "terminar, terminó" (Schumann Gálvez 1973: 98). While Kaufman and Norman (1984: 135) have considered pCh **uht* as a passive (also Stuart 1990a: 221), Kaufman (1994, A 3b: 39) first considered in 1987 that ClM *u[h]t*, "to become, happen" as a mediopassive from pM VER.TR **ut*, "to do". The different ClM spellings involving **u-tV(=CV)** (as in **u-ti**, **u-ti=ya** and **u-to=ma**) should etymologically rather be analysed as *u*<*h*>*t*, but considering the fact that this form was likely already fossilised in pCh, *u[h]t* still is appropriate, see Stuart and Houston (1994: 45-46) for full phonemic spellings.

CHT	*-el*	VER.INTR.R [+INC]	(Sattler 2004: 368)
CHT	*-el*	VER.INTR [+INC]	(MacLeod 1987: fig. 4)
CHT	*-V_1y*	VER.INTR THEM	(Robertson, Law and Haertel 2010: 165)[370]
CHT	*-Vi*	VER.INTR THEM	(Fought 1984: tab. 3-3)
CHT	*-Vy*	VER.INTR [+COM]	(Sattler 2004: 368)
CHT	*-Vy ~ -ay*	VER.INTR.R [+COM]	(MacLeod 1987: fig. 4)
CHT	*-i*	VER.INTR.R [+COM]	(Sattler 2004: 368)[371]
CHT	*-i*	VER.INTR.R [+COM]	(MacLeod 1987: fig. 4)
CHT	*-i*	VER.INTR [+COM]	(Kaufman 1994, A 3a: 8)
CHT	*-ik*	VER.INTR.R [+SBJV]	(Sattler 2004: 368)
CHT	*-{a,i}-el*	VER.INTR.D [+INC]	(Sattler 2004: 369)[372]
CHT	*-{a,i}*	VER.INTR.D [+COM]	(Sattler 2004: 369)
CHT	*-{a,i}-k*	VER.INTR.D [+SBJV]	(Sattler 2004: 369)
CHR	*-tz'*	MED < VER.TR (appearance)	(Wichmann 1999: 70)
CHR	*-tz'-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-?ka*	MED < VER.TR /I/-system	(Fought 1967: 206)
CHR	*-k'*	MED < VER.TR	(Dayley 1990: 372)
CHR	*-k'*	MED < VER.TR (state-change)	(Wichmann 1999: 71-72)
CHR	*-k'-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-k'-a*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHR	*-p*	MED < VER.TR (motion)	(Wichmann 1999: 69-70)
CHR	*-p*	REFL VER.INTR	(Dayley 1990: 372)
CHR	*-pa*	INTRS	(Oakley 1966: 244)
CHR	*-pa*	REFL < VER.TR /I/-system	(Fought 1967: 201)
CHR	*-p-a*	MED < VER.TR	(Ch'orti' 2004: 139-140)
CHR	*-p-a*	MED < VER.TR.R	(MacLeod 1987: fig. 7)
CHR	*-ta*	INTRS	(Oakley 1966: 244)
CHR	*-ta*	RES < VER.TR /I/-system	(Fought 1967: 202)
CHR	*-t*	RES VER.INTR	(Dayley 1990: 372)
CHR	*-e / CeC ~ -i*	VER.INTR THEM	(Wichmann 1999: 22, 24-25, 39)
CHR	*-V*	VER THEM	(del Moral 1988: 400-401)
CHR	*-V_1y*	VER.INTR THEM	(del Moral 1988: 419)
CHR	*-Vy*	VER.INTR (of motion)	(Oakley 1966: 243)
CHR	*-Vy*	VER.INTR /CVC (of motion)	(Wichmann 1999: 22)
CHR	*-ay*	VER.INTR /n-CVC	(Wichmann 1999: 22)
CHR	*-i ~ -Vy*	VER.INTR.R [+IND]	(Dayley 1990: 371)
CHR	*-ay*	VER.INTR [+INC]	(del Moral 1988: 403, 405)
CHR	*-Vy ~ -ay*	VER.INTR.R [+INC,+COM]	(MacLeod 1987: fig. 4)
CHR	*-V_1y*	VER.INTR.R [+COM]	(Kaufman and Norman 1984: 103, tab. 13)
CHR	*-i(y)*	VER.INTR [+COM]	(Kaufman 1994, A 3a: 8)
CHR	*-i ~ -V*	VER.INTR.R [+COM]	(MacLeod 1987: fig. 4)
CHR	*-ay /√CC_*	VER.INTR.R [+COM]	(Kaufman and Norman 1984: 103, tab. 13)
CHN	*-Vl*	MED < VER.TR.R	(Knowles 1984: 154-155)[373]
CHN	*-p-i*	MED < VER.TR.R [+COM]	(Knowles 1984: 154-155)
CHN	*-el*	VER.INTR [+INC]	(Smailus 1975: 190, 196)
CHN	*-el*	VER.INTR [+INC]	(MacLeod 1987: fig. 21)
CHN	*-e'*	VER.INTR [+INC]	(Pérez González 1985: 57)
CHN	*-e(l) ~ -o(l)*	VER.INTR [+IPFV]	(Knowles 1984: 73)
CHN	*-e, -o*	VER.INTR [+INC]	(MacLeod 1987: fig. 14)

[370] The authors describe this form as an inchoative of semi-productive nature that suffixes to certain root intransitives describing a change of state. In view of the suffix's history, 'inchoative' in this connection can only be understood as an aktionsart of the verb, not the derivational process.

[371] Interestingly, *–i* is only attested with <*tali*> and the otherwise irregular <*bixi*>. All other completive intransitives provided by Morán (1685-95) show the *–Vy* thematic suffix, e.g. <*chamaiet tuut crus*>, "you died on the cross".

[372] In all aspects, derived intransitives feature a vowel /a/ or /i/ preceding the inflective suffix. These all may represent thematic suffixes of intransitivations, as visible with the mediopassive *pas-k-a-el*, "parecer lo buscado".

[373] Both forms, *–Vl* and *–p-i*, have been inferred by MacLeod (1987: fig. 22) via an analysis of the *Maldonado-Paxbolon* papers and are not attested in modern CHN (Knowles 1984: 155). Their identification must remain speculative, but we have cognate forms for *–p* in CHT and CHR. Modern CHN rather circumscribes a mediopassive function by a *–(V)m* inchoative (see Table 16).

CHN	*-{a,o,u}*	VER.INTR [+INC]	(Pérez González 1985: 57)
CHN	*-i*	VER.INTR [+COM]	(Smailus 1975: 196)
CHN	*-ih* /_3.ABS	VER.INTR [+COM]	(MacLeod 1987: fig. 21)
CHN	*-i*	VER.INTR [+COM]	(Pérez González 1985: 57)
CHN	*-(i)*	VER.INTR [+COM]	(Kaufman 1994, A 3a: 8)
CHN	*-i* /_-3.ABS ~ -Ø	VER.INTR [+PFV]	(Knowles 1984: 73)
CHN	*-i* /_-3.ABS	VER.INTR [+COM]	(MacLeod 1987: fig. 14)
CHN	*-Ø*	VER.INTR [+COM]	(MacLeod 1987: fig. 14)
CHL	*<h>…-el*	MED < VER.TR.R [+INC]	(MacLeod 1987: fig. 16)
CHL	*<h>…-i(y)*	MED < VER.TR.R [+COM]	(MacLeod 1987: fig. 16)
CHL	*<h>…-ik*	MED < VER.TR.R [+SBJV]	(MacLeod 1987: fig. 16)
CHL	*-(y)-el*	MED < VER.TR.D [+INC]	(MacLeod 1987: fig. 16)
CHL	*-(y)-i*	MED < VER.TR.D [+COM]	(MacLeod 1987: fig. 16)
CHL	*-el*	VER.INTR [+INC]	(Warkentin and Scott 1980: 71)
CHL	*-e-l*	VER.INTR [+PRS]	(Attinasi 1973: 207-208, 213-214, tab. 22)
CHL	*-el*	VER.INTR [+INC]	(Dayley 1990: 374)
CHL	*-el*	VER.INTR [+IPVF]	(Vázquez Alvarez 2002: 36)
CHL	*-el, -Ø*	VER.INTR [+INC]	(MacLeod 1987: fig. 14)
CHL	*-e'*	VER.INTR [+INC]	(Schumann Gálvez 1973: 26)
CHL	*-öl, -al, ol, -l*	VER.INTR [+INC]	(Schumann Gálvez 1973: 26)
CHL	*-i(y)*	VER.INTR [+COM]	(Kaufman 1994, A 3a: 8)
CHL	*-i(y)*	VER.INTR [+COM]	(MacLeod 1987: fig. 14)
CHL	*-i-y*	VER.INTR [+PFV]	(Vázquez Alvarez 2002: 36)[374]
CHL	*-i(y) ~ -e(y)*	VER.INTR [+COM]	(Dayley 1990: 374)
CHL	*-i*	VER.INTR [+COM]	(Warkentin and Scott 1980: 71)
CHL	*-i*	VER.INTR [+PST]	(Attinasi 1973: 207-208, 213-214, tab. 22)
CHL	*-i*	VER.INTR [+PST]	(Schumann Gálvez 1973: 26)
CHL	*-öy, -iy*	VER.INTR [+PST]	(Schumann Gálvez 1973: 26)

Table 46: Ch'olan forms for the intransitive / mediopassive marker.

The linguistic situation in the Yukatekan languages (Table 47) is to a lesser degree the result of shifting morpheme functions. We can identify three distinct patterns for (1) the mediopassive, (2) related celeritives and (3) intransitive aspect markers. Unlike Ch'olan, there are no mergers between the mediopassive and the marking of intransitives.

The development of the mediopassive in Yukatekan shows some parallel to the passive in YUK (see Chapter 3.1.1.1). According to Dayley (1990: 378), all four languages show a reflex of the pM **<h>* infix. These are realised as a glottalisation of the root vowel in ITZ, a vowel lengthening in MOP and LAK as well as (modern) YUK, where we additionally observe a tonal change from CVC to CV́VC (Bricker 1986: 26). The pYu therefore can be reconstructed as **<V>* by this evidence.

Reflexes of the pM **–C* celeritives (Kaufman 1994, A 4b: 41, 52-55) are retained in all four languages, to a varying degree. The least productive is MOP, for which only *–k'* with one root is attested (Hofling 2007: 12). Most common are *–p* and *–k'* in all other three, while Colonial YUK featured *–t* and *–ch* as innovations.

Root intransitives retain a reflex of pM plain status **–i(-k)* (Kaufman 1994, A 3a: 8) for the completive aspect, which we find in all Yukatekan languages as *–i({Ø, h, ʔ})* / __#. The incompletive $-V_1l$ is an innovation (Kaufman 1994, A 3a: 16, 29) based on the pM **–(e-)al* incompletive participle

374 Perfective has to be understood in the sense of completive. The author interprets the following /y/ not as a proper part of the thematic suffix, but as an epenthesis. Although CHL only has the allomorphs *–iy* and *–ʌy*, their pattern is very much like the ECh $-V_1y$, as stated above. I therefore tend to consider the form *–i* / __-3SG.ABS as an elision: /y/ > [Ø] / __#, compare *tsa' ochiyon*, "entré" vs. *tsa' ochi*, "entró" (Aulie and de Aulie 1978: 204).

or gerund of intransitives[375]. As the data demonstrate, all languages have an allomorph ~ *–el* restricted to verbs of motion. It is interesting to note that besides incompletive positional, inchoative and root transitive marking, this is another instance, where a nominal suffix got reinterpreted as an aspect marker.

Idiom	Attestations		Sources
ITZ	*<?>*	MED < VER.TR	(Hofling and Tesucún 2000: 56-57, 389-390)
ITZ	*-Vl*	MED.PTCP < VER.TR,VER.INTR	(Hofling 1991: 36-37)
ITZ	*-Vl*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 40)
ITZ	*-(i)*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 40)
ITZ	*-p*	CEL < VER.TR	(Hofling 2007: 11)
ITZ	*-p-aj*	PASS (agentless)	(Hofling and Tesucún 2000: 58, 390-391)
ITZ	*-k'*	CEL < VER.TR	(Hofling 2007: 11)
ITZ	*-k'-aj*	CEL < VER.TR	(Hofling and Tesucún 2000: 58, 391-393)
ITZ	*-Vl ~ -Ø*	VER.INTR [+INC]	(Hofling 1991: 26-27)
ITZ	*-Vl ~ -ʌl*	VER.INTR [+INC]	(MacLeod 1987: fig. 37)
ITZ	*-Vl ~ -al*	VER.INTR [+INC]	(Itza' 2001: 89-90)
ITZ	*-Vl*	VER.INTR [+INC]	(Schumann Gálvez 1971: 44)
ITZ	*-el*	VER.INTR [+INC] (motion)	(MacLeod 1987: fig. 37)
ITZ	*-Ø*	VER.INTR [+INC]	(Bricker 1986: tab. 9)
ITZ	*-i*	VER.INTR [+INC]	(MacLeod 1987: fig. 37)
ITZ	*-Ø*	VER.INTR [+COM]	(Hofling 1991: 27)
ITZ	*-i*	VER.INTR [+COM]	(Schumann Gálvez 1971: 44)
ITZ	*-ih*	VER.INTR [+COM]	(Bricker 1986: tab. 9)
ITZ	*-ij /_#*	VER.INTR [+COM]	(Itza' 2001: 90)
ITZ	*(-aj)*	VER.INTR [+COM]	(Hofling 1998: tab. 1)
ITZ	*-Vk*	VER.INTR [+SBJV]	(Hofling 1991: 28)
ITZ	*-Vk*	VER.INTR [+SBJV]	(Bricker 1986: tab. 9)
ITZ	*-ej*	VER.INTR [+FUT]	(Itza' 2001: 90-91)
MOP	*<V>…-Vl*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 40)
MOP	*-el*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 40)
MOP	*-ol*	MED < VER.TR [+INC]	(Hofling 2011: 14)
MOP	*<V>…-(i)*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 40)
MOP	*-Ø*	MED < VER.TR [+COM]	(Hofling 2011: 14)
MOP	*-ok*	MED < VER.TR [+DEP]	(Hofling 2011: 14)
MOP	*-k'-al*	CEL < VER.TR [+INC]	(Hofling 2007: 12)
MOP	*-k'-aj*	CEL < VER.TR [+COM]	(Hofling 2007: 12)
MOP	-V_1*l, -Ø*	VER.INTR [+INC]	(Schumann Gálvez 1997: 112, 113)
MOP	*-Vl, -Ø*	VER.INTR [+INC]	(Mopan 2001: 123-128)
MOP	*-Vl ~ -ʌl*	VER.INTR [+INC]	(MacLeod 1987: fig. 37)
MOP	*-el*	VER.INTR [+INC] (motion)	(MacLeod 1987: fig. 37)
MOP	*-el*	VER.INTR [+INC]	(Hofling 2011: 14)
MOP	*-Ø*	VER.INTR [+INC]	(Bricker 1986: tab. 9)
MOP	*-i /_#*	VER.INTR [+COM]	(Schumann Gálvez 1997: 120)
MOP	*-i /_#*	VER.INTR [+COM]	(Mopan 2001: 136)
MOP	*-i*	VER.INTR [+COM]	(MacLeod 1987: fig. 37)
MOP	*-Ø*	VER.INTR [+COM]	(Hofling 2011: 14)
MOP	*-Vk, -äk*	VER.INTR [+SBJV]	(Schumann Gálvez 1997: 142)
MOP	*-Vc*	VER.INTR [+SBJV]	(Bricker 1986: tab. 9)
MOP	*-ek*	VER.INTR [+DEP]	(Hofling 2011: 14)
LAK	*<V>…-Vr*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 30)
LAK	*<V>…-(i)*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 30)
LAK	*<V>…-Vk*	MED < VER.TR [+SBJV]	(MacLeod 1987: fig. 30)
LAK	*-p-ʌh-ʌr*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 30)
LAK	*-p-ʌh(-i)*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 30)

[375] This, according to Kaufman (cited by Mora-Marín [2001: 54]), is also the origin for the Ch'olan incompletive marker *–el* which he supposes to have been assimilated from Yukatekan (therefore, rather pYu).

LAK	*-p-ʌh-ʌk*	MED < VER.TR [+SBJV]	(MacLeod 1987: fig. 30)
LAK	*-k'(-ah)-ʌr/ir*	CEL < VER.TR.R [+INC]	(MacLeod 1987: fig. 30)
LAK	-V_1l	VER.INTR [+PRS]	(Bruce 1968: 97)
LAK	*-Vr ~ -Vh*	VER.INTR [+INC]	(MacLeod 1987: fig. 27)
LAK	*-er*	VER.INTR [+INC] (motion)	(MacLeod 1987: fig. 27)
LAK	*-V(') ~ -Vh*	VER.INTR [+INC]	(Kováč 2012: 3)[376]
LAK	*-Vl, -Vn /√n_*	VER.INTR [+INC]	(Bricker 1986: tab. 9)
LAK	*-Vn /√{m,n}_*	VER.INTR [+INC]	(MacLeod 1987: fig. 27)
LAK	*-en /√{m,n}_*	VER.INTR [+INC] (motion)	(MacLeod 1987: fig. 27)
LAK	*-Ø*	VER.INTR [+INC]	(Bricker 1986: tab. 9)
LAK	*-Ø*	VER.INTR [+PST]	(Bruce 1968: 98)
LAK	*-iʔ* /_-3SG.ABS	VER.INTR [+PST]	(Bruce 1968: 98)
LAK	*-i* /_-3SG.ABS	VER.INTR [+COM]	(MacLeod 1987: fig. 27)
LAK	*-i*	VER.INTR [+COM]	(Kováč 2012: 2)
LAK	*-i(h)*	VER.INTR [+COM]	(Bricker 1986: tab. 9)
LAK	*-Vk*	VER.INTR [+SBJV]	(Bricker 1986: tab. 9)
YUK	<´V_1>	MED < VER.TR.R	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 333, 346)
YUK	<´V_1>…-V_1l	MED < VER.TR [+INC]	(Dayley 1990: 376)
YUK	<´*V*>…*-Vl*	MED < VER.TR [+INC]	(MacLeod 1987: fig. 30)
YUK	<´V_1>…*-i*	MED < VER.TR [+COM]	(Dayley 1990: 376)
YUK	<´*V*>…*-i*	MED < VER.TR [+COM]	(MacLeod 1987: fig. 30)
YUK	<´*V*>…*-Vk*	MED < VER.TR [+SBJV]	(MacLeod 1987: fig. 30)
YUK	*-p*	INTRS	(McQuown 1967: 235)
YUK	*-{p,k,t,ch}-ah*	MED < VER.TR	(Smailus 1989: 25-28)
YUK	*-p*	MED	(Dayley 1990: 377)
YUK	*-p-ah-al*	PASS [+INC] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)
YUK	*-p-ah(-ih)*	PASS [+COM] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)
YUK	*-p(-ah)-ak*	PASS [+SBJV] (agentless)	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 346-347)
YUK	*-k'*	INTRS	(McQuown 1967: 235)
YUK	*-k'*	MED	(Dayley 1990: 377)
YUK	*-k'-ah-al*	CEL [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)
YUK	*-k'-ah(-ih)*	CEL [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)
YUK	*-k'-ah-ak*	CEL [+SBJV]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347)
YUK	*-Vl, -al*	VER.INTR [+INC]	(McQuown 1967: 235, 236)
YUK	-V^vl	VER.INTR [+INC]	(Smailus 1989: 24)
YUK	-V_1l	VER.INTR [+INC]	(Tozzer 1921: 52)
YUK	*-Vl*	VER.INTR [+INC]	(MacLeod 1987: fig. 46)
YUK	*-el*	VER.INTR [+INC] (motion)	(Smailus 1989: 24)
YUK	*-el*	VER.INTR [+INC] (motion)	(MacLeod 1987: fig. 46)
YUK	-V_1l	VER.INTR [+INC] (pat.-subj.)	(Dayley 1990: 376)
YUK	-V_1l	VER.INTR [+INC]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 344)
YUK	*-Vl ~ -Vh*	VER.INTR [+INC]	(MacLeod 1987: fig. 27)
YUK	*-el*	VER.INTR [+INC]	(MacLeod 1987: fig. 27)
YUK	*-Ø*	VER.INTR [+COM]	(McQuown 1967: 235)
YUK	*-Ø*	VER.INTR [+INC] (agent-subj.)	(Dayley 1990: 376)
YUK	*-i* /_#	VER.INTR [+COM]	(Smailus 1989: 24)
YUK	*-i* /_#	VER.INTR [+COM]	(Tozzer 1921: 71)
YUK	*-i* /_#,3.ABS	VER.INTR [+COM]	(MacLeod 1987: fig. 46)
YUK	*-i*	VER.INTR [+COM]	(Dayley 1990: 376)
YUK	*-i*	VER.INTR [+COM]	(Kaufman 1994, A 3a: 8)
YUK	*-Ø, -ih*	VER.INTR [+COM]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 344)
YUK	*-i(h)*	VER.INTR [+COM]	(MacLeod 1987: fig. 27)
YUK	*-eb'al*	VER.INTR [+FUT]	(MacLeod 1987: fig. 46)
YUK	*-Vk, -ak*	VER.INTR [+SBJV]	(McQuown 1967: 237)
YUK	-V^vk	VER.INTR [+SBJV]	(Smailus 1989: 24)
YUK	-V^vk	VER.INTR [+SBJV] (motion)	(Smailus 1989: 24)

[376] We can observe the cases with the –*Vl* suffix that occasionally [l] > [Ø, ʔ, x]. Compare to *a[h] pek' kuwene'*, "el perro duerme", *in wene ich in ch'ak*, "duermo en mi cama", for which Kováč notes that "*[w]eneh* sería más correcto."

YUK	-V_1k	VER.INTR [+SBJV]	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 344)

Table 47: Yukatekan forms for the intransitive / mediopassive marker.

Tzeltalan features three distinct morphemes (Table 48) regarding mediopassive and intransitive marking. As a reflex of pM *<h>*, both members of the branch feature the derivational infix which may be subject to morphophonemic alterations.

Common to both languages are celeritives as reflexes of pM **–p* > TZE *–b*, TZO *–p’*, *–p*, **–q’* > TZE, TZO *–k’*, **–tz’* > TZE *–tz’*, *–tz*, TZO *–tz* and **–k’* > TZE, TZO *–ch’*. It is interesting to note that modern Tzeltalan languages not only apply the celeritive suffixes to transitive roots, but primarily to positionals (see footnote 186). This may be related to the development of the pWM **–ey* versive which has already been discussed above among the Ch’olan languages and in Chapter 3.1.1.2. It only remained productive as –V_1y among positional roots in Colonial TZE.

Like with root transitives (Chapter 3.1.3.1), Tzeltalan does not mark the plain status of intransitives. Only the dependent status is marked with *–uk*.

Idiom	**Attestations**		**Sources**
pTz	*<h>	MED < VER.TR.R	(Kaufman 1972: 141)
pTz	*-Vy	INTRS	(Kaufman 1972: 142)
pTz	*-p’ix ~ -p’ux	VER.INTR < POS	(Kaufman 1972: 141)
pTz	*-¢’ix ~ -¢’ux	VER.INTR < POS	(Kaufman 1972: 141)
pTz	*-č’ix ~ -č’ux	VER.INTR < POS	(Kaufman 1972: 141)
pTz	*-k’ix ~ -k’ux	VER.INTR < POS	(Kaufman 1972: 141)
pTz	*-¢aʔax	VER.INTR < POS	(Kaufman 1972: 141)
TZE	<j>	MED < VER.TR	(Dayley 1990: 384)
TZE	<j>	MED < VER.TR	(Kaufman 1994, A 4a: 45)
TZE	<h>	MED < VER.TR	(Kaufman 1971: 54)
TZE	<h>	INTRS < VER.TR	(Slocum 1948: 83)[377]
TZE	<h>	INTRS < VER.TR	(Hinmán Smith n.d.: 121-122)
TZE	-{p’,c’,č’,k’}-Ṽh	CEL < POS	(Kaufman 1971: 51-52)
TZE	-{b,k’,č’,c’,c}-Vh	CEL < VER.TR (certain)	(Slocum 1948: 83)[378]
TZE	-caʔah	CEL < POS	(Kaufman 1971: 52)
TZE	-Ø	VER.INTR [+IND]	(Kaufman 1971: 104)
TZE	-Ø	VER.INTR [+IND]	(Dayley 1990: 369)
TZE	-uk	VER.INTR [+SBJV]	(Kaufman 1971: 104)
TZO	<j>	MED < VER.TR	(Kaufman 1994, A 4a: 45)
TZO	<h>	MED < VER.TR.R	(Haviland 1981: 236)
TZO	-k’-uj	CEL < VER.TR	(Kaufman 1994, A 4b: 53)
TZO	-{p’,p,tz,ch’}-Vh	CEL < VER.TR,POS	(Laughlin 1975: 81, 159, 160, 163, 167, 339)[379]
TZO	-Ø	VER.INTR [+IND]	(Schuller 1925: 200)
TZO	-Ø	VER.INTR [+IND]	(Dayley 1990: 367)

[377] Slocum just talks about an intransitivising infix, but by comparison with other linguistic materials, this morpheme can be attributed to mediopassive formation. We furthermore have [h] > [ʔ] /__{m, n, h, s, b, l, ’} and [+STOP, +AFFRICATE] / CVh__ > [+GLOTTALISED] as the occurring morphophonemic processes. Interestingly, the semantics of the derived examples provided are merely the result of simple valency reduction, e.g. *kuhč’*, “endure” < *–kuč*, “carry” or *puhk’*, “spread word” < *–puk*, “divide among”. Nevertheless, the meaning is connected.

[378] These are the same suffixes as described for celeritives from positional roots (see footnote 186, Table 13), considering the frequent overlap between positionals and transitives. These derivations require a *–Vj* suffix to follow and feature a change of state or motion, e.g. *saybuh*, “become limp”, *balčuh*, “roll around” or *nuhc’eh*, “fall face downwards”.

[379] Compare to the following examples: *hoyp’ih*, “turn over”, *huč’p’ih*, “fall on one’s seat”, *kapih*, “get mixed up”, *ben¢ah*, “bulge”, *kač¢ah*, “crack open”, *tilč’uh*, “break (arm, leg)”.

TZO	*-uk*	VER.INTR [+SBJV]	(Schuller 1925: 201)

Table 48: Tzeltalan forms for the intransitive / mediopassive marker.

When examining the evidence of the Greater Q'anjobalan branch (Table 49), the major disadvantage to encounter is the preponderant absence of mediopassive and celeritive data in the grammars. Only for TOJ, several authors (Furbee-Losee 1976: 62-64, Supple and Douglass 1949: fn. 6) noted the similarity of <*j*> to the TZE mediopassive (see footnote 382). This is not surprising, considering the fact the we have an active exchange attested between TOJ and Tzeltalan, as with the antipassive (Chapter 3.1.3.2). As already outlined in Chapter 3.1.1.1, pM *<*h*> finds a reflex in several Greater Q'anjobalan *–(V)j* ~ *–(V)h* forms (cf. Kaufman 1994, A 4a: 46) that represent the passive voice. The other firm evidence for a mediopassive comes again from TOJ *–(a)x* (although sometimes referred to as a passive, see footnote 157). The form finds its cognate in CHJ *–(V)x* and supposedly developed out of the pM reflexive intransitiviser **–a-ox* : **–ox* (Kaufman 1994, A 4a: 44), note that reflexive and mediopassive are both more actor-oriented. A special case is MCH that reinterpreted (like WAS and TZU) a reflex of the pM antipassive **–o-an* : * *–an* as a mediopassive.

There is obviously some confusion among the grammarians regarding Greater Q'anjobalan passive and mediopassive forms. It seems that the languages of this branch took a very different way than opposed to Ch'olan that finds morphological distinction between the passive and the mediopassive. According to Alexiadou and Doron (2012: 5-6), there are three possible distinctions of voice systems[380]. While Ch'olan in general (and ClM in specific) belong to System I, Greater Q'anjobalan apparently does not. The only exception from this pattern seems to be TOJ with a System I voice structure, possibly influenced by its proximity to the Tzeltalan area. More research beyond the scope of this study is necessary to decide whether it belongs to System II or III. The latter seems likely when assuming semantic evidence which is morphologically marked the same as the passive.

Likewise, reflexes of the pWM **–ey* versive may only have survived as intransitive positional markers (Chapter 3.1.1.2) in QAN *–ay* and POP *–y-i* (see footnote 199) and QAN *–ay* inchoative (Chapter 3.1.1.3). The Greater Q'anjobalan branch apparently discontinued the use of this suffix in contrast to GT.

All Greater Q'anjobalan languages in general feature *–i(h)* ~ *–i(y)* to mark intransitive verbs in the plain status, regardless of the aspect which is provided by preposed aspect markers. This marker represents a reflex of the pM plain status marker, following Kaufman (1994, A 3a: 12) rather of the ~ **–i-h* (or **–i-V*) allomorph.

Idiom	Attestations		Sources
CHJ	*-ih /_#*	VER.INTR [+PLAIN]	(Hopkins 1967a: 73, 122-123, 129)
CHJ	*-(i)*	VER.INTR [+PLAIN]	(Kaufman 1994, A 3a: 8)

380 The authors subsume several cases, including reflexives, anticausatives and mediopassives under 'middle voice'. The three systems are : (I) passive and middle voice exist and are distinguished, (II) passive does not exist, but middle voice does, and (III) passive exists, but middle voice does not, although there is semantic evidence for them.

CHJ	*-i /_#*	VER.INTR [+IND]	(Dayley 1990: 363)
CHJ	*-i /_#*	VER.INTR [+INC,+COM]	(Domingo Pascual 2007: 150, 154-156)
CHJ	*-(i)*	VER.INTR [+INC,+COM]	(García Pablo and Domingo Pascual 2007: 119)
CHJ	*-(i)*	VER.INTR [+IND]	(Buenrostro Díaz 2009: 122-129, 140-143, 150-160)[381]
TOJ	<h_1>	INTRS < VER.TR,POS	(Furbee-Losee 1976: 62-64)
TOJ	*<j>*	INTRS < VER.TR	(Kaufman 1994, A 4a: 45)[382]
TOJ	*<j>*	INTRS < VER.TR	(Dayley 1990: 364)
TOJ	*<h>*	INTRS < VER.TR,POS?	(Supple and Douglass 1949: 171)
TOJ	*-xi, -x*	impersonal-experience voice	(Lenkersdorf 2002: 184-185)
TOJ	*-x*	PASS	(Dayley 1990: 364)
TOJ	*-ax*	MED	(Kaufman 1994, A 4a: 44)
TOJ	*-š*	MED < VER.TR	(Supple and Douglass 1949: 171)[383]
TOJ	-$š_3$	MED < VER.TR	(Furbee-Losee 1976: 58, 136-137)
TOJ	*-X3*	MED < VER.TR	(Furbee-Losee 1981, II: 86)
TOJ	*-y ~ -iy*	VER.INTR [+INDEP]	(Supple and Douglass 1949: 173)[384]
TOJ	-iy_2	VER.INTR [+INDEP]	(Furbee-Losee 1976: 139)
TOJ	*-iy*	VER.INTR [+PLAIN]	(Kaufman 1994, A 3a: 8)
TOJ	*-i(y)*	VER.INTR [+IND]	(Dayley 1990: 364)
TOJ	*-k /CVC_-on*	VER.INTR [+POT]	(Supple and Douglass 1949: 173)
QAN	*-i*	VER.INTR [+IND]	(Martin 1977: 129)
QAN	*-i /_#*	VER.INTR [+INC,+COM]	(Q’anjob’al 2005: 111-112)
QAN	*-i /_#*	VER.INTR [+INC,+COM]	(Mateo Pedro 2009: 50)
QAN	*-i /_#*	VER.INTR [+PLAIN]	(Mateo Toledo 2008: 55)
QAN	*-oq*	VERR.INTR [+POT]	(Martin 1977: 129)
QAN	*-oq /_#*	VER.INTR [+POT]	(Q’anjob’al 2005: 111-112)
QAN	*-oq /_#*	VER.INTR [+POT]	(Mateo Pedro 2009: 50)
QAN	*-oq /_#*	VER.INTR [+POT]	(Mateo Toledo 2008: 56-59)
AKA	*-i /_#*	VER.INTR [+INC,+COM]	(Méndez Martinez 2004: 106-112)[385]
AKA	*-i ~ -y*	VER.INTR [+INC,+COM]	(Akateka 2007: 163, 173-177)
AKA	*-i, -Ø*	VER.INTR [+PLAIN]	(Zavala Maldonado 1992a: 47, 48, 49, 61, 67, 78)
AKA	*-i*	VER.INTR THEM	(Zavala Maldonado 1992b: 52, 64)
POP	*-i /C_ ~ -yi /V_*	VER.INTR [+IND]	(Craig 1977: 90)
POP	*-i /C_ ~ -yi /V_*	VER.INTR [+IND]	(Popti’ 2001: 141)
POP	*-i*	VER.INTR [+IND]	(Delgado Rojas et al. 2007: 147, 148-149)
POP	*-y(i)*	VER.INTR [+IND]	(Dayley 1990: 365)
POP	*-oj /_#*	VER.INTR [+IRR]	(Craig 1977: 287)
POP	*-oj /_#*	VER.INTR [+POT]	(Delgado Rojas et al. 2007: 147-148)
MCH	*-o:n ~ -:n*	MED < VER.TR	(Palosaari 2011: 126-127, 190)[386]

[381] The numerous examples provided for intransitive verbs in the context of a phrase do not exhibit a coherent *–i* / __# and *–Ø* / … pattern, suggesting that junctures have a broader definition than being morpheme- or phrase-final, as contrasted between the first and third person progressive of “to sleep”: *wan in-way-i* and *wan s-way-Ø winh* (Buenrostro Díaz 2009: 122), depending on the constituents to follow (compare the examples under #159 [Buenrostro Díaz 2009: 116]). Also see footnote 299 for transitive verbs. Furthermore, derived intransitive verbs more frequently exhibit *–i* / …, unlike root intransitives, e.g. *ix-Ø-laj-w-i chi’ ta* (Buenrostro Díaz 2009: 49).

[382] Kaufman does not explicitly refer to the TOJ infix as the mediopassive, although it is noted among cognates with mediopassive meaning. Other authors (Furbee-Losee 1976: 62-64, Supple and Douglass 1949: fn. 6) likewise noted the correlation with the cognate in TZE that in fact it is a mediopassive. Again, some of the examples feature slight shifts in semantics, e.g. *nihk–*, “to tremble” < *nik–*, “to stir” (Supple and Douglass 1949: 171). Furbee-Losee (1976: 64), considering a cognate for passive derivation, however provides further examples that exhibit a semantic shift pointing to a mediopassive, e.g. *7u-*h_1*-k’*, “to seep” < *7uk* [sic!], “to drink”.

[383] Though not directly referred to as a mediopassive, the examples provided prove an intransitivations while keeping the original meaning of the transitive root / stem, e.g. *ʔilš* < *ʔil*, “to see” and *tuhk’aš* < *tuhk’a*, “to shoot”.

[384] The suffix appears both in the incompletive and completive aspect. The allomorphs are conditioned by the root: *–y* appears with CVC stems, *–iy* with monosyllabic CVCC and disyllabic stems.

[385] As with transitive verbs (Table 39), the general rule elides the thematic suffix with 1SG.ABS and 3PL.ABS, also when deictic enclitics and/or the subjunctive *–oj* is required. Derived intransitives are also marked with the thematic, e.g. *Ø-k-ʔal-on-i*, “digamos” (Zavala Maldonado 1992a: 47). In complex phrases, *–i* can also be realised as *–Ø*, e.g. *ṣ̌-Ø-y-ʔuk’-on[-Ø] ʔaa=tex nax*, “quien tomó el agua” (Zavala Maldonado 1992a: 49).

MCH	*-i*	VER.INTR THEM	(Martin 1990: 423)
MCH	*-i*	VER.INTR [+IND]	(Dayley 1990: 367)
MCH	*-i ~ -e /CeC*	VER.INTR [+IND]	(Palosaari 2011: 122)
MCH	*-o(')*	VER.INTR [+SBJV]	(Palosaari 2011: 172, 173)

Table 49: Greater Q'anjobalan forms for the intransitive / mediopassive marker.

Only the Ch'olan and Tzeltalan evidence can account for cases within control group 2 and will be investigated for their orthographic realisation for the *–V₁y* suffix (Table 50). No other branch that so far has hieroglyphically attested vernaculars features this suffix among root intransitives or mediopassive forms[387]. Celeritives and supposed mediopassives (as referred to in the literature, but rather inchoatives, see Chapter 3.1.1.3) of a *–C-V(j)* pattern are already analysed as part of test group 1 (Chapter 3.1.1.1)[388].

The linguistic data from Ch'olan need to be split up into two cases, as outlined above. Not necessarily grammatically, but semantically[389], both are mediopassive. Considering the grammatical shift of the suffix, its orthographic realisation must also be viewed against the valency of the verbal root. Several case studies conducted by Wald (2007: 278-302) prove the majority of verbal roots to be transitive, hence *–V₁y* serves as an intransitiviser. Common to this function is the **CV₁=yi** / __# spelling. In accordance with the ECh and CHL evidence, we have to expect *–i* to follow as a thematic / intransitive status suffix to mark the resulting derivation as an intransitivised verb[390]. The preponderant usage of

[386] Palosaari acknowledges that MCH *–(o):n* is a reflex of the pM antipassive (see Chapter 3.1.3.2), a view also shared by Martin (1990). By contextual semantic analyses, Palosaari (2011: 204-207, 211-213) broadens the meaning of the *–(o):n* suffix of not being exclusively antipassive in use, as it does not always involve patient demotion. Therefore, the MCH mediopassive shows a different genesis than the middle voice in most other Mayan languages (cf. Houston, Robertson and Stuart 2000: 333).

[387] We therefore have to refuse the proposal that **T'AB=ya** < *t'ab-[a]y-Ø* (XLM Col. 1, B5) is a Yukatekan vernacular (Lacadena and Wichmann 2005a: 32) only because of its orthography in applying **ya** instead of the standard **yi** sign. Furthermore, we find the same spelling on CAY Lnt. 1, C12 (Gronemeyer 2011b: 330). Also see footnote 393.

[388] Those allomorphs that follow a *–C-aj* pattern specifically. Potential forms with **–C-ij ~ *–C-uj* that either may point towards a pCh or pTz form can be expected in the epigraphic record, but are excluded. A special note deserves the pTz **–p'* celeritive reconstructed by Kaufman. Although pTz is one candidate for the emergence of this phoneme, it is more likely that it was received from pYu not earlier by the time WCh and ECh split (Wichmann 2006b: 53). Hence, as Wichmann (2006b: 54) concluded, it is unlikely to find any ***p'V** signs in the syllabary. If this sound was already existent and supposed to be featured in writing, it would have likely been represented by a **pV** or **bV** sign.

[389] When a derivational mediopassive is chosen (in contrast to other intransitivisers), the verbal phrase accentuates the actor. This becomes particularly interesting with the root *tzutz* among 'period endings', commonly paraphrased as "to finish" (Stuart 2001a: 19). As Christian Prager (personal communication, February 12, 2012) pointed out on CHN, CHL, and CHR evidence also cited by Stuart, *tzutz* might actually refer to the "sowing" of a new calendrical unit. Also see the semantic relation to weaving (Hruby and Robertson 2001: 27-29). Apart from the actual meaning, a mediopassive *tzutz-uy-i-Ø* in contrast to a passive *tzu<h>tz-aj-Ø* rather highlights time as the actor to manifest calendar units. That calendrical units are animated entities was demonstrated by Callaway (2009) by the "birth" of the *winal* and its marching on the road (of time), as it was later still recorded in the *Chilam Balam* books.

[390] Phonologically, both forms are the same, but are morphologically distinct. ECh (Kaufman and Norman 1984: 104-105, tab. 13) marks derived intransitives with a thematic (e.g. *–a* with passivations, *–i* with other intransitivations) plus *–Ø* as the completive status marker. CHL does not use thematic suffixes, but applies *–i* as a completive intransitive status marker. The appearance of *–i* has already been theorised by Houston, Robertson and Stuart (2000: 329), although they did not separate in function. Also see footnotes 127 and 130 for a discussion.

=yi therefore actually serves the purpose to express the thematic as $-V_1y$*-i* / __-3SG.ABS[391]. Interestingly, as ECh thematics probably originate from pre-pCh or pGT intransitivisers **–aj* and **–ij* (see Chapter 3.1.1.1, also Kaufman and Norman [1984: 105]), certain derivations retain *–aj* in ClM, while the final spirant here is already elided to just *–i*.

As $-V_1y$ as a root intransitive status marker in the completive is an ECh innovation, no final *–i* is to expected in these cases. This development might have an impact on orthographic patterns (as Zender [2005b: fn. 11] was already speculating), although it is sometimes difficult to determine whether a ClM verb was transitive or intransitive. Wald (2007: 297-303) exemplifies *lok'* and *t'ab* as questionable cases. Both verbs are later attested as root intransitives with $-V_1y$ in CHT and CHR (cf. Fought 1984: 53, Wald 2007: fig. 116). It is not unlikely that these roots were transitive in pCh and only later became intransitives to be marked with $-V_1y$ as their status marker in ECh[392]. As suffixation with *–i* versus $-V_1y$ differs within the Ch'olan languages for specific root intransitives, it should be possible to identify vernacular features if such forms appear with distinct spelling patterns in ClM.

However, as *–i* is common among all four Ch'olan languages, such spellings are not necessarily a diacritic criterion and are not relevant for the case of control group 2 (see Wald [2007: 266] for common **Ci** / __# spellings with root intransitive verbs). However, if a verb shows shifting patterns between *–i* and $-V_1y$ / $-V_1y$*-i*, a vernacular influence is at least debatable[393]. Also, if $-V_1y$ ~ *–Vy* occurs with roots other than verbs, this might also indicate a CHL (or WCh) vernacular[394].

For the Tzeltalan branch, only a general pTz **–Vy* has been reconstructed that finds its reflexes in the modern TZO *–e(y)* passive (Chapter 3.1.1.1) and the Colonial TZE $-V_1y$ intransitive positional (Chapter 3.1.1.2). Only the latter function is of relevance for control group 2 for which evidence may

[391] In this respect, I follow Mora-Marín (2009: 144) and suspend a long vowel, while Wald (2007: 268) follows "[a]s usual, the strategy […] to drop the **i** of the final **yi**" and takes disharmonic spellings as an indicator for complex vowels. Lacadena and Wichmann (2005b: 15) also propose ***–VVy* based on a pM **–VVr* passive, an assumption that above all ignores the typological development of mediopassive to passive (see footnote 362).

[392] Wald (2007: 271-275) was able to testify with *pul* that it was still considered a transitive verb with a mediopassive derivation <*pului*> (and the thematic *–i* possibly already lost) in CHT, but now is a root intransitive in CHR (also see footnotes 326 and 404 for ECh *–y* intransitivations). It is reasonable to assume the same process with several other verbs, and it confirms the above assumption of the semantic shift of $-V_1y$ in ECh. This shift was probably not a synchronic development, but began at different times for individual lexemes. For example, *lok'* is already intransitive in CHT, while CHL (still?) has it as a transitive root.

[393] Such a case may be the two examples of **T'AB=ya** on XLM Col. 1, B5 and CAY Lnt. 1, C12. With just two examples the representativeness is limited, but interestingly both postdate 720 AD (Gronemeyer 2011b: 330). If this is not an emanation of the 'vowel shorting' to explain the loss of complex vowels (see Chapter 2.5.3.2), an alternative explanation may be a vernacular. As the **ya** sign cannot straightforward spell a mediopassive derivation including the intransitive marker, we would need to reconstruct **t'ab-[a]y[-i]-Ø* in contrast to the abundant **T'AB=yi** < *t'ab-[a]y-i-Ø* (e.g. K4976, B1). However, this requires to assume that *t'ab* was a transitive root, as it is suggested by Yukatekan and Tzeltalan evidence, while even for pCh it is reconstructed as intransitive (Kaufman and Norman 1984: 133) – although with different semantics in each branch (cf. Wald 2007: 300-303). If *t'ab* was still transitive in ClM by a common pGT ancestor, late spellings like **T'AB=ya** might actually indicate the shift to an intransitive *t'ab-[a]y-Ø*. The provenience of both examples remains problematic in this sense: they are far outside the hitherto attested ECh isolines (Figure 2). Still, as ECh was quite paradigmatic for certain morphological features (as best demonstrated by the *–aj* thematic and *–laj* intransitive positional), it may be possible that its development still influenced Late ClM.

[394] As CHL still has a reflex of a 'general versive' (see footnote 367). Such a possible form was discussed by Wald (2007: 303-306) by **na-ja=yi** < *naj-ay-i-Ø* (PAL T18S, 158) from a reconstructed WCh adjective **näj*, "full, satisfied", although other etymologies are possible.

be found as a vernacular in the hieroglyphs. If it originated together with the pCh *–V_1y mediopassive from a pGT *–V_1y 'general versive', the same **CV_1=yi** / __# spelling may be expected, but any other **=yV** sign is possible, as no final *–i* status marker is required in Tzeltalan. Although the suffix has been reconstructed for Early Classic pCh (Houston, Robertson and Stuart 2000: tab. 5), no decisive evidence has yet been found, the same is true for the pTz intransitive positional marker (Wichmann 2006a: tab. 1) and its proposed vernaculars in Tonina and Pomona (Lacadena and Wichmann 2005a: 35-36)[395].

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-V_1y-i*	**CV_1-CV_1=yi / CV_1C-CV_1=yi**	1.a,b,c,d.i,ii
		CV_1C=V_1-yi	1.e.i
	√-[V_1]y-i	**CV_1-CV_2=yi / CV_1C(-CV_2)=yi**	2.a,b,c,d.i,ii (2.e.i,ii)
	√<h>-i	**CV-Ci / CVC(-Ci)**	1.g.i
Eastern Ch'olan	(*) *√-V_1y*	**CV_1-CV_1=yV / CV_1C-CV_1=yV**	1.a,b,c,d.i,ii
		CV_1C=V_1-yV	1.e.i
	(*) *√-[V_1]y*	**CV_1-CV_2=yV / CV_1C(-CV_2)=yV**	2.a,b,c,d.i (2.e.i)
Western Ch'olan	*√-Vy-i*	**CV_1-CV=yi / CV_1C(-CV)=yi**	1.a,b,c,d.i,ii (2.e.i,ii)
Yukatekan	*√<V>-i*	**CV-Ci / CVC(-Ci)**	
Tzeltalan	*√-V_1y*	**CV_1-CV_1=yV / CV_1C-CV_1=yV**	1.a,b,c,d.i,ii
		CV_1C=V_1-yV	1.e.i
	√-[V_1]y	**CV_1-CV_2=yV / CV_1C(-CV_2)=yV**	2.a,b,c,d.i (2.e.i)
	√<h>	**CV-CV / CVC(-CV)**	-
	√-C_d-V_Sj	**CV_1-CV_1=C_dV_S=ja**	1.f.i
	C_d={p',tz',k',ch'}	**CV_1C(-CV_1)=C_dV_S=ja**	1.f.i

Table 50: Representative, linguistically induced spelling patterns on junctures to be expected for the intransitive / mediopassive marker among Ch'olan, Yukatekan and Tzeltalan.

3.1.4.2 – Intransitive Positional Marker –V_1y

The potential marking of intransitive positional (assumptive) verbs with *–V_1y among pre-pCh/pCh as well as pTz/TZE cases has already been discussed in Chapter 3.1.1.2. Look up Tables 11 to 15 for the attested linguistic forms.

That early texts may feature *–V_1y remains only a speculative assumption by the linguistic reconstruction by Houston, Robertson and Stuart (2000: tab. 5). The Ch'olan family itself does not support such a form, so we must imply a late pGT form to have been recorded, since pTz has a *–$V_{(1)}y$ intransitiviser (in versive and assumptive function) which is retained as a –V_1y intransitive positional marker in Colonial TZE and a non-productive *–Vy* versive in modern TZE (Kaufman 1971: 59). In pGT, we can assume a *–V_1y versive/inchoative that shifted to a root transitive intransitiviser in pCh. As the discussions in Chapters 3.1.1.2 and 3.1.1.3 revealed, there are intimate connections between

[395] Footnote 66 already mentioned TRT Jd. 1, A6 with **PAT=ya** (Gronemeyer 2006b: 97), which is also interpretable as a mediopassive *pat-[a]y[-i]-Ø*. Notable is the harmonic suffixation with **ya**. There are several caveats. Firstly, several spellings from the corpus of Tortuguero feature strong evidence for a WCh vernacular influence (see footnotes 223 and 315) which makes a Tzeltalan vernacular unlikely. Secondly, the positional root *pat* is notorious for also being inflected and derived as a root transitive, showing the blur between these two lexical classes (Wichmann 2002a: 7-8), e.g. transitive **u=pa-ta=wa** < *u-pat-a-Ø* (CRC St. 17, A2) or antipassive **i=PAT=ni** < *i['] pat-[a]n-Ø* (CPN Alt. S, I1b).

inchoatives and assumptive forms as 'actions of becoming into state/position'. Such a functional sharing might have been existent in pGT and even pre-pCh, but must remain speculative. No such positional *√-V_1y has yet been epigraphically attested in an Late Pre-Classic or Early Classic inscriptions for several possible reasons[396].

Examples that specifically point to a Tzeltalan vernacular are equally weak. Spellings with **=ji-ya / __#** in Tonina (Lacadena and Wichmann 2005a: 35-36) are likely not to represent an earlier *<h>…-aj-iy* to contain both forms that later diverged in TZE and TZO. I agree with the authors that it likely the proper pTz *<h>…-aj=iy* with a temporal enclitic suffixed, therefore rather representing test group 1 cases. The occurrence of such positional suffixation in Pomona, a western lowland site, can only be unsatisfactorily explained by political relations with Tonina.

In any case, such –V_1y intransitive positionals might be expected with the same **CV$_1$=yi** or **CV$_1$=yV / __#** spellings as shown in Table 50. The apparent shared origin of the suffix from a pGT versive marker makes a parallel orthographic realisation likely.

3.1.5 – Test Group 3: Instrumental Suffix *–Vb ~ –b*

The evidence from Ch'olan reveals that the instrumental suffix itself basically follows a *–Vb* pattern. We have evidence from several languages (Table 51) that there was a shift from the final [b'] > [p/p'], though. While CHR and CHN are included among the examples, Wichmann (2006b: 48) in contrast sees [p'] absent from CHR at all, but possibly present in CHT and definitely in WCh (Wichmann 2006b: 51-52). Whether any of the languages feature [p/p'] for the instrumental as an (optional) allomorphic variant to the common Ch'olan [b'] or whether this is dialectally induced was not possible to determine by the sources. Wichmann (2006b) discusses the phonological conditions, but also concludes that the innovation might have taken place around the fifth century AD. Because of the appearance of the plain stop considered in CHR, Storniolo (2008: 225-226) has argued we find this phonology hieroglyphically realised in an ECh vernacular context in Copan[397]. As the [b'] > [p/p'] shift

[396] Among the possible reasons rank: (1) the scarcity of early texts and an insufficient sample of data; (2) problems concerning the linguistic reconstruction; (3) the evolution of the writing system after a functional shift of the writing system.

[397] The examples provided exhibit several differences. Storniolo reconstructs an allomorph *–V'p*, where the glottalised vowel is certainly derived from vowel-disharmonic principles, as the spelling **ko-xo-pa-AJAW-wa** (CPN Str. 9N-82 Hbh. 1, J1) shows, reconstructed as *kox-o'p ajaw* (Storniolo 2008: fig. 4.6a). The spelling **ko-xo-o-pa** on CPN Alt. W, B1 reinforces the /o'o/ value of the spelling. The harmony rules in the suffix domain (Lacadena and Wichmann 2005b) have not yet been successfully verified (see Chapter 1.2.1.2), although the *o-a* pattern is accepted to represent a glottalised vowel in both models (Lacadena and Wichmann 2004: 111, Robertson et al. 2007: 10) and other examples of a **CV$_1$-V$_1$-CVa** spellings seemingly support this. However, Lacadena and Wichmann (2004: 121-122) cite examples, e.g. **to-k'a**, which violate these rules and which are supposed the feature a long vowel instead, as in *took'*. Other examples of *koxo'p* are realised by **ko-xo-pi** (QRG Alt. O', F'1), with *o-i*, not defined by Lacadena and Wichmann (2004: 111) and prohibited by the alternate model (Robertson et al. 2007: 10). The lexical basis of the root **kox* to actually be able to be derived by an instrumental also has not satisfactorily been solved, although CHR has *kojxi* as "limp, hobble" (Hull 2005: 63) and an apparent agentive form of a verbal root **ko-xo=ma mu-lu** < *kox-om mul* is known from RAZ Bur. 19 V. 15, E1-F1. The second example provided by Storniolo (2008: fig. 4.6b), the Copan emblem glyph, can also be dismissed for two reasons. Most importantly, the main sign is now morphographically read as **KIP** (suggested by Péter Bíró, Nikolai Grube,

also occurs in other LL languages, Wichmann (2006b: 53) probably correctly considers as well a point of time around 1000 AD for this process, thus we could exclude the possibility of *–Vp* in the inscriptions.

While the default vowel generally is [i], we seldom find [ʌ] in CHN and CHL as well as [a] in CHR. According to Storniolo (2008: 166), ECh underwent a left to right vowel assimilation, therefore we find [i] in CHT and CHR as the default, when the root vowel is [a] or [u], the vowel of the instrumental suffix echoes the it[398]. While **–äb* has been reconstructed for pCh, we might add **–ib* as well from the glyphic evidence[399].

A final point of consideration are morphosyntactic affixation conditions for the instrumental, involving the change of the lexical class of the root morpheme. As Wichmann (2002a: 6) notes, the instrumental is "merely a label for a specific category of derived nouns, not necessarily an adequate semantic description of all instances of these derived nouns." He summarises three environments to which an instrumental may apply: (1) the instrument to carry out a verbal action, (2) the result of a verbal action and (3) the place of the verbal action. The key is that the instrumental derivation causes a NOUN < VER change of the part of speech, it functions as a nominaliser. While not specifically noted in any grammar, Wichmann (2002a: 11-15) concluded by comparative evidence that only intransitive verbs serve as the basis. The pattern is well documented for positional roots (Bricker 1986: 45) with the *–l* intransitiviser (see also Chapter 3.1.1.2) in all Ch'olan languages except CHR (Wichmann 2002a: tab. 1). Further lexical evidence (Wichmann 2002a: tab. 3) also contributes other intransitivisers (Table 51). There are uncertain examples (see footnote 404), but *a priori*, the basis of a Ch'olan instrumental should be an intransitive form[400].

While certain intransitivising morphemes may therefore occur before the instrumental suffix, the relationship between the morphology and the semantics of the instrumental has not yet been inves-

Guido Krempel, Christian Prager and Elisabeth Wagner in 2010), where the **pi** sign serves as a phonemic complement. Recently, a syllabic value **ch'u** was suggested as well for this sign (Bíró 2011c: 304-309). Secondly, as per the harmony rules, *u-i* would yield a long vowel, not a glottalised one. The hieroglyphic evidence for a **–Vp* suffix is therefore very weak, also acknowledging the fact that the linguistic evidence otherwise only indicates a short and not a complex vowel.

398 This rule cannot be generalised, as the example *waynib'*, "sleeping room" (Hull 2005: 112) shows. As the instrumental is not directly attached to the stem, but shows the form *–n-ib*, there might be further morphophonemic rules applying, but sufficient data are missing. The rule would also violate the author's (Storniolo 2008: 225-226) own assumptions regarding ECh instrumental vernaculars in the inscriptions, as the instrumental of *kox* should be **kox-ib* rather, and not ***kox-o'p*. Data from Fought (1967: 197) further suggest that the suffix vowel in CHR is conditioned by the *–a* or *–i* thematic occurring with a verbal root. As (see Table 46) CHR root intransitives have *–i* ~ *–e* (with the latter allomorph not attested for the instrumental), the only explanation for *–a* is the passive thematic suffix. CHR has invariably *–ib* following other *–(V)C* intransitivising suffixes.

399 Compare to Early Classic **yu=k'i=bi** < *y-uk'-ib* on COL Pearlman #33, A1 (Coe 1982: 33). No distinction between [ʌ] and [a] was made in hieroglyphic writing and the contrast was lost in ECh, a pCh or WCh instrumental **–äb* ~ *–ab* was therefore probably realised by a **Ca=ba** / __# spellings.

400 So far, the instrumental has only been described with either root intransitives or intransitivised verbs out of root transitive and positional stems. It is apparently not common to derive instrumentals out of verbal forms that have been intransitivised out of other lexical classes (e.g. the inchoative).

tigated[401]. Naturally, instrumentals out of positional roots should predominantly refer to the third environment (e.g. CHL *ñaclib*, “base (de casa)” from *ñacal*, “sentado” [Aulie and de Aulie 1978: 61]) , but there may be smooth transitions between the categories. And as the hieroglyphic example (**CHAK=li=bi** < *chak-l-ib*, “prisoner” on TNA Mon. 27, B2) provided by Wichmann (2002a: 7-8) shows, the blur between transitive and positional roots compounds the situation even further.

Idiom	Attestations		Sources
pCh	**-äb*	INSTR	(Kaufman and Norman 1984: 145)
ECh	**-Vb’*	INSTR	(Storniolo 2008: 225)
ECh	**-V’p*	INSTR	(Storniolo 2008: 166)
CHT	*-ib*	INSTR	(Bricker 1986: tab. 20)
CHT	*-ib’*	INSTR < VER.TR.R,VER.INTR.D	(MacLeod 1987: fig. 9)
CHT	*-ib’*	INSTR < VER.TR.R,VER.INTR.R	(Sattler 2004: 384)
CHT	*-ib’*	INSTR < VER.INTR.D	(Sattler 2004: 384)
CHT	*<h>…-ib’*	INSTR < PASS < VER.TR.R	(Wichmann 2002a: tab. 1)
CHT	*<h>…-ib*	INSTR < PASS < VER.TR /CVC	(Robertson, Law and Haertel 2010: 188-189)
CHT	*-Vib’ ~ -aib’*	INSTR < VER.TR.R,VER.INTR.R	(Sattler 2004: 384)[402]
CHT	-V_1-*ib’*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHT	*-l-ib’*	INSTR < POS	(Wichmann 2002a: tab. 1)
CHT	*-lib’*	INSTR < POS	(Sattler 2004: 385)
CHT	*-na-ib’*	INSTR < VER.TR.D	(MacLeod 1987: fig. 9)
CHT	*-n-ib*	INSTR < VER.TR /non-CVC	(Robertson, Law and Haertel 2010: 188-189)
CHT	*-b’el*	INSTR [+BEN]	(Sattler 2004: 380)[403]
CHR	*-ip’*	INSTR	(Bricker 1986: tab. 20)
CHR	*-ip’*	INSTR < INTR,NOUN /CVhC	(MacLeod 1987: fig. 9)
CHR	*-i?p /C_*	INSTR < /A bases	(Fought 1967: 226)
CHR	*-V?p*	INSTR < I/ roots [-IR]	(Fought 1967: 226)
CHR	*-Vp’*	INSTR < VER.D,NOUN	(MacLeod 1987: fig. 9)
CHR	*-ib’*	INSTR < VER.INTR.R,POS	(Wichmann 2002a: tab. 1)
CHR	*-?p*	INSTR /VN_ thematic	(Fought 1967: 197, 226)
CHR	*-ap ~ -ip*	INSTR	(Oakley 1966: 245)
CHR	*<h>…-ib’*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHR	*-n-ib’*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHR	*-(n)-ib’ ~ -ob’*	INSTR	(Ch’orti’ 2004: 136-137)[404]

[401] It is not uncommon for Mayan languages to form a semantically related meaning out of a verbal root by deriving it into another verbal form, as this YUK antipassive shows: *čul*, “enlarge” > *čúul*, “swell up” (Bricker, Po’ot Yah and Dzul de Po’ot 1998: 346). The semantics and rhetoric of verbal forms has been detailed in a case study for TZO (Haviland 1994). Therefore, different intransitivations of the same root might be used as a strategy to increase the number of different instrumentals with different meanings. On the other hand, there is lexical evidence for identical forms with a variety of meanings, e.g. CHR *waynib* as “narcotic, soporific, sedative” (Wisdom 1950: 752) and “sleeping room” (Hull 2005: 112) and where the semantics can be discerned by the context.

[402] According to Sattler (2004: 384), this form is far less frequent than the instrumental on *–ib*. The vowel may drop (Boot 2004a: 7) and in fact it seems to be an underlying *–Vh-ib* < *–Vj-ib* form with a lenition process. Some of the examples provided by Morán (1685-95: 38) are root intransitives that retain their thematic vowel, e.g. <*xamaib*> and <*coloib*>. For the case of <*tzibaib*> refer to footnote 83 for the verbalisation paradigm of *tz’ihb*, which appears here intransitivised by an antipassive (Wichmann 2002a: tab. 1). The instrumental itself therefore is just *–ib* again, occasionally preceded by a thematic not elided. While <*tzibaib*> is given as “aquello con se escribe”, we also have <*tzibuib*> as “tintero” (Feldman n.d.).

[403] The suffix being described here as marking “the verb in that the action is performed through something or for somebody” (Sattler 2004: 380) is not to be compared with the actual instrumental (Bricker 1986: 45), but indeed as proper beneficative. The same apparently applies for the CHN form.

[404] In the analyses of the examples, *–n* is described as a transitivising suffix, but some of them are transitive roots already. According to Wichmann and his examples (2002a: tabs. 1, 3) this suffix represents the passivation of non-CVC transitives rather (see Chapter 3.1.1.1). In that respect, it is interesting to observe the case of *we’nib*, “dish, table” (Hull 2005: 112) from the already intransitive *we’*, “to eat” (cf. Kaufman and Norman 1984: 135). In

CHR	*-on-ib'*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHR	*-n-ip'*	INSTR < VER.TR.R	(MacLeod 1987: fig. 9)
CHN	*-ib*	INSTR < VER	(Smailus 1975: 145)
CHN	*-on-ib'*	INSTR < VER.TR.R	(MacLeod 1987: fig. 23)
CHN	*-ab'-al ~ -ib'-al*	INSTR < VER.TR.D,INTR,NOUN	(MacLeod 1987: fig. 23)
CHN	*-äb ~ -ib*	INSTR < VER	(Keller and Luciano 1997: 428)
CHN	*-ib'*	INSTR < VER.INTR.R	(Wichmann 2002a: tab. 1)
CHN	*-ip' ~ -äp'*	INSTR < VER.TR,POS,NOUN	(Knowles 1984: 178-180)[405]
CHN	*-ip' ~ -äp'*	INSTR	(Bricker 1986: tab. 20)
CHN	*-ʌp*	INSTR < VER.INTR.R	(MacLeod 1987: fig. 18)
CHN	*-k-ib'*	INSTR < PASS < VER.TR.R	(Wichmann 2002a: tab. 1)
CHN	*-quib ~ -quiba*	INSTR < VER	(Keller and Luciano 1997: 428)
CHN	*-on-ib'*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHN	*-(V)-n-ip'*	INSTR < VER.TR.R,VER.TR.D	(MacLeod 1987: fig. 18)
CHN	*-l-ib'*	INSTR < POS	(Wichmann 2002a: tab. 1)
CHN	*-l-ip'*	INSTR < POS	(MacLeod 1987: fig. 18)
CHN	*-lib ~ -liba*	INSTR < VER (place of action)	(Keller and Luciano 1997: 428)[406]
CHN	*-(V)-b'el*	VER [+INSTR]	(MacLeod 1987: fig. 23)
CHN	*-be(l) ~ -be(r)*	INSTR < VER.TR (unprod.)	(Knowles 1984: 176)
CHN	*-b'-el*	INSTR < VER.TR.R (unprod.)	(MacLeod 1987: fig. 18)
CHL	*-ib*	INSTR	(Bricker 1986: tab. 20)
CHL	*-ib'*	INSTR < VER.INTR.R	(Wichmann 2002a: tab. 1)
CHL	*-ib'*	INSTR < VER.INTR.R	(Kaufman 1994, A 4a: 33)
CHL	*-ab'*	INSTR < VER.INTR.R (unprod.)	(Kaufman 1994, A 4a: 33)
CHL	*-(i)b{a, ʌ}l*	ABSTR	(Attinasi 1973: 156)[407]

the script, we can observe the expected **WE'=i-bi** < *we'-ib* (K6080, H1-J1 [Gronemeyer 2011b: fig. 6b]) only, i.e. an instrumental directly from an intransitive stem. To otherwise explain the CHR *–n*, two options come into mind: (1) *we'* was at some point at least polyvalent (cf. Haviland [1994: 699-701] for TZO root categories) and the instrumental contains a fossilised intransitivation or (2) it is perceived as a non-CVC intransitive which frequently apply *–n-ib* (Kerry Hull, written communication, October 20, 2011). Another example is *waynib*, "dormitory", that in CHR may reflect a fossilised instrumental from a previous non-CVC root (Kerry Hull, personal communication, October 19, 2011). However, an expected *way-[i]b* form (e.g. **tu WAY=bi=li**, TNA Frg. 91, pD2) as "domicile, dormitory" (Houston and Stuart 1989: 11-13) is known from the inscriptions (graphematically identical to another derivation to indicate a title [Beliaev 2004], considered to be an agentive). Likewise, the example of *yuch'nib*, "vaso" (Ch'orti' 2004: 136) has implications for glyphic spellings. Hull (2005: 111) lists *uch'*, "drink" as a polyvalent verbal root, while it is otherwise known from Ch'olan as a solely transitive root (cf. Kaufman and Norman 1984: 135). Thus, an intransitivised instrumental should also be the expectation in the hieroglyphs, yet only **yu=UK'=bi** ~ **yu=k'i=bi** < *y-uk'-ib* is known (after Mora-Marín [2004c]). MacLeod (written communication, October 8, 2011) considers the pYu cognate to *uch'* used in the script to require a YUK morphology as well and which allows and prefers transitive verbs to form the instrumental. However, we also have a plain *uch'ibʌl*, "taza" in CHL (Aulie and de Aulie 1978: 104). Two other options also apply: (1) in accordance to the CHR data, the verb is polyvalent in other Ch'olan languages including ClM (as we have antipassive forms, e.g. **UK'=ni** < *uk'-[u]n-Ø* on PNG P. 2, P1), or (2) we have the case of a <h> passivation, yielding **y-u<h>k'-ib* in the transcription rather. There are two cases **yu=k'i=yi?=bi** (K1379, J1-L1) and **yu=k'i=li=bi** (K5070, J1-K1). The first case may be a mediopassive, and the inscription shows other 'irregularities' (see footnote 102). The second looks like the positional instrumental, considering the blur of lexical classes, this spelling seems to involve an intransitivation indeed. Another issue arises with *mesyob'*, "escoba" (Ch'orti' 2004: 137), based on the transitive root *mesu*, "to sweep" (Hull 2005: 83, Pérez Martínez 1996: 141), possibly involving a fossilised *–y* intransitiviser (also see footnotes 326, 392 and 437). There is very limited evidence at least for CHR that some instrumentals can be derived from forms other than intransitives. In this connection it is also interesting to observe that CHR deviates from the other Ch'olan languages with the innovation not to require the *–l* intransitiviser with positional roots (Wichmann 2002a: 16-17, tabs. 1, 3), e.g. *buch-ib*, "seat" from *buch*, "to sit". Positionals furthermore may overlap with transitives (Wichmann 1999), so deviating patterns may be expected.

[405] In contrast to the other three languages, CHN seems to be more free as per the original lexical class, e.g. with nouns: *pat-an-ip'*, "work place" < *pat-an*, "work". Of interest are some of Knowles' analyses regarding stative positionals, e.g. *čum-l-ip'*, "chair" < *čum-u(l)*, "seated" or *muk-l-ip'*, "jail" < *muk-u(l)*, "locked up". This view imposes the *–l* to be the syncopated positional suffix, whereas I would still concur with Wichmann to consider *–l* as the intransitiviser of positional roots.

[406] One can certainly further segment into *–l-ib(a)*. This form is attached to positional and transitive roots, while root intransitives take *–äb ~ –ib* and passivised transitives *–quib(a)*.

CHL	*-ib'(-ʌl)*	INSTR < PASS < VER.TR.R	(MacLeod 1987: fig. 18)[408]
CHL	*-ib(ʌl)*	NOUN < VER.INTR	(Warkentin and Scott 1980: 20)
CHL	*<h>…-ib'*	INSTR < PASS < VER.TR.R	(Wichmann 2002a: tab. 1)
CHL	*-jCib(ʌl)*	NOUN < VER.TR	(Warkentin and Scott 1980: 21)
CHL	*-int-ib'*	INSTR < PASS < VER.TR.R	(Wichmann 2002a: tab. 1)
CHL	*-l-ib'(-ʌl)*	INSTR < POS	(MacLeod 1987: fig. 18)
CHL	*-l-ib'*	INSTR < POS	(Wichmann 2002a: tab. 1)
CHL	*-lib(ʌl)*	NOUN < VER.TR,POS	(Warkentin and Scott 1980: 22)
CHL	*-lib*	INSTR < POS	(Aulie and de Aulie 1978: 222)
CHL	*-on-ib'*	INSTR < ANTIP < VER.TR.R	(Wichmann 2002a: tab. 1)
CHL	*-on-ib'*	INSTR < ANTIP < VER.TR.R	(Kaufman 1994, A 4a: 33)
CHL	*-onib*	NOUN < VER.TR.R,POS	(Aulie and de Aulie 1978: 222)
CHL	*-on-ib'(-ʌl)*	INSTR < VER.TR.R	(MacLeod 1987: fig. 18)
CHL	*-onib(ʌl)*	NOUN < VER.TR	(Warkentin and Scott 1980: 21)
CHL	*-Vh-ib'*	INSTR < ANTIP? < VER.TR.R	(Wichmann 2002a: tab. 1)
CHL	*-ʌh-ib'*	INSTR < VER.TR.D	(MacLeod 1987: fig. 18)
CHL	*-ʌhib*	NOUN < VER.TR	(Warkentin and Scott 1980: 21)
CHL	*-il*	INSTR < VER.TR.R	(Aulie and de Aulie 1978: 222)
CHL	*-o'*	INSTR (compound)	(MacLeod 1987: fig. 18)

Table 51: Ch'olan forms for the derivational instrumental suffix.

The instrumental in Yukatekan (Table 52) is quite uniform with only a few exceptions. The majority of cases follows a *–Vb* (MOP and YUK) ~ *–V'* (ITZ and LAK) pattern (see also footnote 140 for the sound change). The suffix vowel is mostly described to echo the root vowel, while syncopated forms may appear. MOP has *–eeb* when the instrumental is preceded by another verbal suffix, e.g. causatives or intransitive positionals. Modern YUK has the innovation to additionally prefix *š–* to the stem (Bricker 1986: 40).

The Yukatekan languages are more productive to derive instrumentals than Ch'olan. The base does not need to be a (derived) intransitive, but the suffix can be attached to any verbal stems with only a few morphophonemic restrictions. In fact, the opposite seems to be true, as most grammars exemplify the instrumental with transitive roots. Another peculiarity show modern YUK and ITZ: because of its *š–* prefix, it can also derive from other parts of speech and mark the suffix position not with the usual $–V_1b$ suffix, but the one typical for the base word (e.g. $–V_1l$ for adjectives), at least with non-verbal bases, *š–* becomes the sole instrumental morpheme, the same with ITZ *aj–*. The semantics of instrumentals resulting from transitive vs. intransitive verbs has not yet been systematically investigated[409].

407 Some of the examples provided exhibit a broad range of meanings, but may be categorised under one of the three basic categories, e.g. *na:t-ibal*, "intelligence, thought" < *na:t*, "understanding" as the tool for comprehension. One case is particularly interesting: *lembal*, "aguardiente" < *lem*, "tomar (bebidas alcohólicas)" (Aulie and de Aulie 1978: 51). This does not readily describe the instrument for the verbal action (e.g. CHR *we'nib*, "dish, table" < *we'*, "eat" in footnote 404) nor the result of acting (e.g. "drunkenness"), but rather the basis for the related action to enable it / make it possible, or to which it is directed (also cf. footnote 423 for an analogous case in AKA). It might be added as a fourth category to Wichmann's (2002a: 6) classification.

408 The *–ʌl* suffix only occurs as an absolutive status marker when the instrumental noun is unpossessed (MacLeod 1987: fig. 18).

409 See footnote 410 for some consideration in YUK. More interesting is the comparison between languages. Except for some common words (like Ch *uch'ib* ~ Yu *uk'ib*, the semantic differences of instrumentals based on a verbal root with *identical* meaning in several languages is remarkable: *mak*, "cover" (cf. Hull and Carrasco [2004] for a discussion) e.g. produces CHL *mähkib'äl*, "prison", CHR *mahkib'*, "enclosure" and YUK *š makab'*, "ma-

Idiom	Attestations		Sources
ITZ	*-Vb’ ~ -V’*	INSTR	(Hofling and Tesucún 2000: 110)
ITZ	*-V_r’*	INSTR	(Bricker 1986: tab. 19)
ITZ	*-V’*	INSTR < VER.TR	(MacLeod 1987: 42)
ITZ	*aj-*	INSTR < NOUN	(Itza’ 2001: 87)
MOP	*-Vb’*	INSTR < VER.TR (few)	(MacLeod 1987: 42)
MOP	*-V_1b*	INSTR < VER	(Schumann Gálvez 1997: 82)
MOP	*-eeb’*	INSTR < VER	(Hofling 2011: 26)
MOP	*-e·b’*	NMLS < VER.TR	(Ulrich and Ulrich 1966: 262)
MOP	*-b’-eeb’*	INSTR < VER.TR	(MacLeod 1987: 42)
MOP	*-beeb*	INSTR	(Bricker 1986: tab. 19)
MOP	*-b’eeb’*	INSTR < VER	(Mopan 2001: 255-256)
MOP	*-(b)eeb*	INSTR < VER (to use/serve for)	(Schumann Gálvez 1997: 82)
MOP	*-l-eeb’*	INSTR < POS	(MacLeod 1987: 42)
MOP	*-l-eeb’*	INSTR < POS	(Hofling 2011: 26)
MOP	*-(es)-a-b’-eeb’*	INSTR < VER.TR.D [+CAUS]	(MacLeod 1987: 42)
LAK	*-V_rʔ*	INSTR	(Bricker 1986: tab. 19)
LAK	*-V’*	INSTR < VER.TR.R,NOUN (rare)	(MacLeod 1987: fig. 32)
YUK	*-Vb’*	NMLS < VER (non-prod.)	(McQuown 1967: 240)
YUK	*-V_rb*	INSTR < VER.TR.R	(Smailus 1989: 121)
YUK	*-b-*	INSTR	(Swadesh, Álvarez and Bastarrechea 1970: 24)
YUK	*-eb ~ -Vb*	INSTR	(Swadesh, Álvarez and Bastarrechea 1970: 24, 35)
YUK	*š-…-V_rb’*	INSTR < VER.TR.R,VER.TR.D	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 365)
YUK	*-V_rb’*	INSTR	(Bricker 1986: tab. 19)
YUK	*-Vb’*	INSTR < VER.TR.R,NOUN	(MacLeod 1987: fig. 32)
YUK	*-Vb’*	INSTR	(Kaufman 1994, A 4a: 33)
YUK	*š-…-ah*	INSTR < ANTIP < VER [+CAUS]	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 365)[410]
YUK	*š-…-V_1l*	INSTR < ADJ < VER.TR	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 366)
YUK	*š-*	NOUN	(Bricker, Po’ot Yah and Dzul de Po’ot 1998: 366)

Table 52: Yukatekan forms for the derivational instrumental suffix.

Tzeltalan instrumental formation (Table 53) follows the well established *–Vb* pattern. A number of vocalisations have been reconstructed for pTz, depending on the valency of the verbal stem. A trend towards vowel unification is observable in the modern representatives of the branch. While Colonial TZE at least has *–ab* and *–ib*, only the letter is retained in modern TZE as *–(h)ib*. From the morphologically conditioned *–ab* and *–ob* of Colonial TZO, only the latter is used today (Haviland 1981: 319)[411].

Transitive and intransitive verbal roots may equally serve as the basis to derive the instrumental noun in described manner. Both modern TZE and TZO furthermore have preserved the intransitivation via *–l* of a positional stem also observable in Ch’olan (except CHR) and MOP plus *–eb* to mark the instrumental.

chine that inserts plugs or lids” (Bricker, Po’ot Yah and Dzul de Po’ot 1998: 177, Wichmann 2002a: tab. 3). Otherwise, nominal phrases are used to specify the instrumental, cf. CHR *mahkib e* + NOUN (Wisdom 1950: 521) and TZO *makobil e* + NOUN (Haviland 2007: xxvii-xxviii).

[410] Some roots take the regular *–Vb* instead of *–ah* when they are not derived by a causative, with a different semantics of the instrumental noun (Bricker, Po’ot Yah and Dzul de Po’ot 1998: 366). This is restricted to a few cases only, e.g. *náʔaks*, “raise” > *š náʔaks-ah*, “elevator” vs. *náʔak*, “rise” > *š náʔaks-ab’*, “staircase”.

[411] There may be some cases of an *–eb* instrumental in modern TZO not described in the grammars. Compare *ʔilebal* with *ʔilob-bail*, “inspection, examination” (Laughlin 1975: 59) and also e.g. *ʔabtehebal*, “tool” from *ʔabteh*, “[to] work” (Laughlin 1975: 38).

Instead of the derivation, the use of a prepositional phrase with *ta* is also described for TZO to describe the object used for an action (Haviland 1981: 131-132) while the verb remains as it is. Alternatively, a construction with the particle *–ʔo* (Haviland 1981: 132-135) is used[412].

Idiom	Attestations		Sources
pTz	**-ib'/-eb'*	INSTR < VER	(Kaufman 1972: 146)
pTz	**-ʌb' ~ -ub'*	INSTR < VER.TR.R,VER.TR.D	(Kaufman 1972: 146)
pTz	**s-…-ob'il*	INSTR < VER.TR.R	(Kaufman 1972: 146)[413]
pTz	**-ob'*	INSTR < VER.TR.R	(Kaufman 1972: 146)
TZE	*-ab, -ib*	INSTR	(Ara 1986: f. 118v, 195r)[414]
TZE	*-ab ~ -ub ~ -ob*	INSTR < VER.TR	(Kaufman 1971: 75)
TZE	*<h>…-ab*	INSTR < POS	(Kaufman 1971: 75)
TZE	*-ib*	INSTR (?)	(Radhakrishnan 1970: 400)
TZE	*-ib / {',l}__#*	INSTR,LOC < VER,POS	(Slocum 1948: 79)
TZE	*-ib*	INSTR < VER.INTR,VER.TR.D	(Kaufman 1971: 74)
TZE	*-hib*	INSTR,LOC < VER	(Slocum 1948: 79)
TZE	*-ohib*	INSTR < VER.TR.R,POS	(Kaufman 1971: 74)
TZE	*-leb*	INSTR < POS	(Wichmann 2002a: 15)
TZE	*<h>…-il*	INSTR < PASS < VER.TR.R	(Slocum 1948: 78)
TZE	*<h>…-il*	INSTR < POS	(Kaufman 1971: 75)
TZE	*-bal*	NMLS < VER	(Slocum 1948: 78)[415]
TZE	*-bal*	NMLS < VER	(Robles Uribe 1962: 44)
TZE	*-bal*	NMLS < VER.TR	(Kaufman 1971: 72)
TZE	*-iʔ-bal*	NMLS < VER (place)	(Radhakrishnan 1970: 402)
TZO	*-ob*	INSTR	(Humberto Ruz 1989: 123)
TZO	*-ob*	INSTR (monosyllabic roots)	(Haviland 1988: 86)
TZO	*-ab*	INSTR (polysyllabic roots)	(Haviland 1988: 86)
TZO	*-eb*	INSTR,LOC < VER	(Haviland 1988: 86)
TZO	*-eb*	NMLS	(García de León 1971: 30)
TZO	*-ob*	place/time/instrument	(Haviland 1981: 319)[416]
TZO	*-Ob*	INTRS,LOC < VER	(Cowan 1969: 105)
TZO	*-ob-bail*	INSTR,LOC < VER [+REFL]	(Haviland 1981: 319-320)[417]
TZO	*-leb*	INSTR < POS	(Laughlin 1975: 115, 125, 157, 361)[418]

412 CHL has a very similar construction of VER + *o'* + NOUN (Warkentin and Scott 1980: 22). It also allows transitives in the compound, it thus broadens the meanings of the derivations, e.g. compare *luchonib*, "cuchara" with *lucho'ja'*, "taza para sacar agua, cubeta" from *luch*, "sacar (alimento o agua de un objeto)" (Aulie and de Aulie 1978: 53). Nicholas Hopkins (personal communication, January 30, 2012) tried to connect this instrumental formation to epigraphic evidence, e.g. with a name/epithet for God L (Christian Prager, personal communication, January 28, 2012) in C Ma. 109c2 as **ti-o-K'UH** < *ti[']-o[']-k'uh*, literally "Eater of Holiness (?)". Another instance is **AJ-K'A'K-o-CHAK**^{ki} < *aj-k'a[h]k'-o[']-cha[h]k* on YAX Lnt. 25, D1, possibly "Burner of *Chahk* (?)". A divine entity being the subject of the action is also **K'IN**^{ni}**-o-CHAK** < *k'in-o[']-cha[h]k* (EKB M. 96G, V1) with a hardly determinable meaning. Interestingly, the murals from EKB Str. 1 Rm. 29-sub prominently feature such spellings that strongly suggest this kind of construction: **K'AK-o-ko-xo-ma** < *k'a[h]k'-o[']-koxom* (M. 96G, Q1, Z3, M. C, Q1) and **AJ-ma-na-o-cho-ma** < *aj-man-o[']-chom* (M. 96G, A'3), while **K'AK'-o-le** < *k'a[h]k'-o[']-le[']* is found on EKB Msc. 7, A5.

413 This form resembles YUK *š-…-Vb'*, but no such from has grammatically been described in modern TZE and TZO, nor makes the apparent innovation in YUK a cognate likely. It rather appears to be a paradigm for a possessed form, since *s–* is 3SG.ERG and *–Vl* often a possessive suffix.

414 The examples are <mesa *veibal qveib*> and <vasso *vchab ha*>.

415 This suffix is semantically related to the fourth category of instrumentals to describe substance or material, as proposed for CHL *–bal* (see footnote 407) and AKA *–b* (see footnote 423), e.g. *ʔuč'bal*, "drink" < *ʔuč'*, "[to] drink". Kaufman (1971: 72) describes this suffix to be fairly productive, and his examples suggest derivations (solely?) for comestible goods, e.g. *lòʔbal*, "plantain" < *lòʔ*, "to eat fruit" and *tìʔbal*, "meat" < *tìʔ*, "to eat meat".

416 Modern TZO has given up the allomorphic distinction *–ob ~ –ab* depending on the phonology of the root and invariably uses *–ob*. The use of *–eb* is semantically restricted and otherwise seems to be fossilised.

417 This form involves a derivation of the reflexive particle *ba*, the resulting noun carries a reflexive / reciprocal sense, e.g. *tzobob-bail*, "lugar para una asamblea" < *–tzob*, "reunir, acumular".

TZO	*-leb*	INSTR < STAT	(Cowan 1969: 105)

Table 53: Tzeltalan forms for the derivational instrumental suffix.

The basic instrumental derivation in the Greater Q'anjobalan branch (Table 54) is *–Vb*. It occurs in overt form in CHJ, TOJ, QAN and POP or in syncopated and often suffixed form as *–(V)b-al* in CHJ, QAN, AKA, POP and MCH. The latter case is especially used with locative derivations from positional roots, where the pan-Mayan *–al* serves as an additional locative suffix. The vocalisation of the *–Vb* suffix is irregular, but [a] is by far the most common, followed by [u] and [o]. The front vowels [i] and [e], which are preponderant in Ch'olan and Tzeltalan respectively, are absent in Greater Q'anjobalan or have other, specific meanings in some languages[419]. Only POP has a root-harmonic instrumental. Interesting to observe is the case of TOJ, where *–ab* serves as the general suffix for transitive roots, while ~ *–ub* seems to be restricted to passivised forms and ~ *–ob* is used less for the instrument or the location of an action, but rather the result.

Greater Q'anjobalan instrumentals feature a broad variety of bases to be derived, unlike Ch'olan. Verbal roots, both transitive and intransitive show a predominance for derivation (e.g. in QAN [Francisco Pascual 2007: 23]), adjectives and nouns are less productive. The productiveness of instrumentals is therefore very close to EM languages (see footnote 432), also in phonology compared e.g. to KCH *–(V)-bal*.

A special observation comes from CHJ and QAN, where an intermediate intransitiviser *–l* is used with positional roots and sometimes transitive verbs. This mirrors the process in Ch'olan, Yukatekan and Tzeltalan. CHJ also has *–p'-ap'* with positionals, seemingly a reflex of the pM **–p* celeritive (see Chapter 3.1.4.1).

Idiom	Attestations		Sources
CHJ	*-l-ap'*	INSTR < VER.TR.R,POS	(Hopkins 1967a: 85)[420]
CHJ	*-p'-ap'*	INSTR < POS	(Hopkins 1967a: 91-92)
CHJ	*-ap'*	INSTR < VER.TR.R	(Hopkins 1967a: 91-92)
CHJ	*-ab'*	INSTR	(Kaufman 1994, A 4a: 33)
CHJ	*-ab'*	INSTR < VER.TR.R	(Domingo Pascual 2007: 183)
CHJ	*-lab'*	INSTR < VER.TR.R	(García Pablo and Domingo Pascual 2007: 136)
CHJ	*-lab' ~ -(n)ub'*	INSTR,LOC < VER.TR.R,POS	(Domingo Pascual 2007: 183-184, 195)
CHJ	*-up'*	NMLS < VER.TR.R	(Hopkins 1967a: 92)[421]

418 The examples are *čotlebal*, "seat", *čeplebal*, "place for setting down burden", *hok'leb*, "place where things are hung from, hook" and *vaʔlebal*, "object that person stands on, place where one stands to get a good view". Positional instrumentals in TZO seem to have a preponderance for a locative function. There are also a few examples of *–eb* with a root intransitive, but these refer to locatives as well, e.g. *k'ot-eb-al*, "purgatorio" (García de León 1971: 30).

419 Compare to TOJ *–ib'* "affine, female link" (Furbee-Losee 1976: 85) and the unique *–eb'* for *c'eh-eb'*, "a tortilla of fresh corn" < *c'eh*, "grained" (Furbee-Losee 1976: 83). However, the latter can be considered the result of a verbal action, thus an instrumental.

420 See footnote 190 for suffix's role as a supposed intermediate verbal stem formation morpheme to further derive intransitives. In this function, it is interestingly also used for the instrumental, e.g. *ʔúk'-l-ap'*, "drinking vessel", also with instrumentals (and thus locatives) based on positional roots, e.g. *loklab'*, "lugar para colgar" (Domingo Pascual 2007: 195).

421 The examples to assume an instrumental use of this suffix are *xúk-up'*, "wash trough" < *xúk*, "to scrape something out" and *čúk-up'*, "hiccups" < *čúk*, "to snatch and gobble food on the sly". These seem to emphasise

CHJ	*-b'il*	INSTR	(Kaufman 1994, A 4a: 33)
CHJ	*-b'al*	LOC	(Buenrostro Díaz 2009: 81)
TOJ	*-ab' ~ -ub'*	INSTR	(Kaufman 1994, A 4a: 33)
TOJ	*-ab'*	INSTR,LOC < VER.TR	(Furbee-Losee 1976: 81-82)
TOJ	*<h>…-ub'*	INSTR < PASS < VER.TR	(Furbee-Losee 1976: 93)
TOJ	*-AB'1 ~ -UB'1*	INSTR,LOC	(Furbee-Losee 1981, II: 1, 79)
TOJ	*-ob'*	NMLS < VER.INTR (product of)	(Furbee-Losee 1976: 86-87)
TOJ	*-OB'1*	NMLS (product of)	(Furbee-Losee 1981, II: 1, 55)
QAN	*-ab', -ob', -ub'*	NMLS < VER.INTR	(Francisco Pascual 2007: 19, 31, 35-36)
QAN	*-(l)-ub'*	NMLS < VER.TR,POS	(Q'anjob'al 2005: 226-227)[422]
QAN	*-b'al*	INSTR,LOC < VER.INTR,VER.TR	(Q'anjob'al 2005: 94, 218)
QAN	*-b'al*	INSTR,LOC	(Francisco Pascual 2007: 23-24)
QAN	*-b'al*	INSTR	(de Diego Antonio et al. 2001: 25)
QAN	*-b'al*	INSTR	(Martin 1977: 158-159)
AKA	*-b'*	NMLS	(Zavala Maldonado 1992a: 98, 141)[423]
AKA	*-b'al*	INSTR,LOC < VER,POS,NOUN	(Akateka 2007: 123, 200)
AKA	*-b'al*	INSTR,LOC < VER,POS,NOUN	(Méndez Martinez 2004: 113, 134, 136, 140)
AKA	*-b'al*	INSTR,LOC < VER	(Zavala Maldonado 1992b: 42)
AKA	*-b'al*	LOC	(Zavala Maldonado 1992a: 103)
POP	*-b'al*	INSTR,LOC	(Ross Montejo and Delgado Rojas 2007: 21-22)[424]
POP	*-b'al*	INSTR,LOC < VER.TR	(Delgado Rojas et al. 2007: 140)
POP	*-b'al*	INSTR,LOC < POS	(Popti' 2001: 172)
POP	*-(o)b'al*	INSTR	(Kaufman 1994, A 4a: 33)
POP	*-(o)b'a(ni)l*	INSTR,GER	(Day 1973: 46)[425]
POP	*-b'a(ni)l*	INSTR,LOC < VER.INTR,NOUN	(Popti' 2001: 116-117, 149)
POP	-V_R*b'*	INSTR < VER.INTR,VER.TR	(Ross Montejo and Delgado Rojas 2007: 26-27)[426]

the result of an action. Especially the first example is of importance, as cognates of *jukub* are not only attested in various EM and WM languages as "canoe" (Kaufman 2003: 995), but also epigraphically in ClM, e.g. **ju-ku-bi** < *jukub ~ jukib* (PNG P. 3, A'3). The spelling may be the only evidence for a *–ub'* instrumental in ClM as a 1.a.ii scheme and represent a lexicalised instrumental in pCh (as we have pYu *–V_1*b* and pTz [and likely pGT] *–*ub*). Bare evidence is given for the verbal root **juk* in the relevant languages, only CHR *juk'i*, "file, sharpen, scrape, scrub, polish, rub" (Hull 2005: 59, Wisdom 1950: 473) and TZE and TZO cognates *jok'*, "chute, dig up, harvest" (Laughlin 1975: 156, Slocum 1953, II: 23) approximate the CHJ meaning – further indication that both etymology and derivation are only reflected in GQa while already lost in pCh (also considering the shift from [k] > [k'] in the pGT examples). Interestingly, Pinola TZE has *juku=te7* (Kaufman 2003: 995), while we have *u-sak-te' jukub* on CML Urn 26 Spine 11, A2-A3. In Ch'olan, we have several references to *sak-te'* (cf. Aulie and de Aulie 1978: 81), a tree of white wood used (today) for the gables of houses.

422 While *–ab'* and *–ob'* are also provided as rare nominalisers of verbs with sometimes uncertain etymology (Q'anjob'al 2005: 215, 224), only *–ub'* is clearly used as an instrumental, e.g. *wayub'ej*, "nido, cama". When used with positionals, the *–l* intransitiviser (Q'anjob'al 2005: 231) is used prior to the nominalisation, following other WM / LL languages, e.g. *chotlub'ej*, "banco (para sentarse)".

423 With *č̥om-b'-al*, "mercado" < *č̥on*, "vender" we have the place of verbal action attested, the example *loʔ-b'-e*, "comida" < *loʔ*, "comer" seems more complicated, but may be part of the tentative fourth category of instrumentals (see footnote 407).

424 Verbs (INTR and TR) and nouns may serve as the basis of derivation. Regarding the semantics of the resulting instrumental or locative, no decisive rule can be established by the original part of speech. The examples provided suggest that transitive verbs rather signify the instrument for an action, intransitives the place of an action and nouns the locality where something abounds. Additionally to the latter case, there is also the suffix *–laj* to describe a "locative of abundance" (Day 1973: 47), which recent grammars classify as a plural suffix (Delgado Rojas et al. 2007: 74).

425 Morphophonemically, the initial [o] occurs / CC(-Ø)-__. The form *–(o)b'al* is used for the gerund function and when the instrumental is part of a nominal compound, when standing alone, *–(o)b'anil* is used. The gerund function described by Day (1973: 46) is not mentioned by Ross Montejo and Delgado Rojas (2007: 21-22), but both grammars doubtlessly describe the same morpheme. Day's example of a gerund is an intransitive verb, so two options arise: the gerund function is restricted to intransitives or it can be used for both verbal types and is contextually or lexically restricted. However, it is intriguing to observe that POP apparently does not distinguish between instrumentals and certain verbal nouns described in Chapter 3.1.6. Also compare to footnote 426.

426 This suffix is described to form nouns that are not verbal nouns or infinitives. If one takes the example *laq'ab*, "pegamento" (from *lak'*, "pegar"), an instrumental use seems obvious. Other examples are not immedi-

POP	*-ab'/-ob'/-ub'*	NMLS	(Stratmeyer et al. 1966: 212)
MCH	*-be'*	INSTR < VER	(Palosaari 2011: tab. 5.1)[427]
MCH	*-obal*	RES < VER.TR	(Palosaari 2011: tab. 5.1)[428]
MCH	*-bal*	NOUN < VER.INTR	(Palosaari 2011: tab. 5.2)

Table 54: Greater Q'anjobalan forms for the derivational instrumental suffix.

The *–Vb* instrumental basically finds attestation in all relevant Mayan branches. But especially the apparent preponderance of *–ib* and to a lesser degree *–ab* in the Ch'olan languages should find a strong trait in the hieroglyphic evidence (Table 55). The suffix vowel is thus potentially not as unpredictable as previously assumed (Houston, Robertson and Stuart 2001b: 16-17), the range of possibilities is at least narrowed. Except the doubtable reconstruction for ECh (see footnote 397), none of the linguistic data demonstrate a complex vowel, thus synharmonic spellings are expected: **Ci=bi / __#** and **Ca=ba / __#** therefore should be strong indications for an instrumental, possibly generalised to a **CV_1=bi / __#** spelling, where **bi** serves as a spelling group 2 graphematic indicator. None of the reconstructed vocalisations, **–äb* (pCh [Kaufman and Norman 1984: 145]) and **–(o)b* (pM, after Campbell [Palosaari 2011: 88]) is exclusively represented in the script, assuming that vocalic diversification and shifts (as a result of linguistic splitting) occurred at a rather early point (see footnote 399).

While all Ch'olan languages require an intransitive verb to form the instrumental, only few examples of an intransitiviser preceding the suffix are known from hieroglyphic writing (Wichmann 2002a: 6-17). This allows several interpretations (see footnote 404): (1) most instrumentals known from ClM actually derive from root intransitives, (2) as in Yukatekan and Tzeltalan, an immediate derivation was possible from both transitives and intransitives in ClM[429], (3) the preferred ClM method to intransitivise for an instrumental was the *<h>* passive (Chapter 3.1.1.1) which would barely leave an orthographic trait[430]. The instrumental out of other parts of speech than a verb has not yet been satisfactorily proven in the inscriptions[431] and only modern YUK seems to actually feature it.

ately recognisable, but taking Wichmann's definition (Wichmann 2002a: 6) that an instrumental may refer to the result of an action as well, additional examples fit into this category, e.g. *b'olob'*, "incendio" < *b'ol*, "quemar". I therefore consider this suffix, not least because of its phonological structure, as an instrumental. The 'resultative' (or possibly 'telic' [Smith 1991: 19]) semantics of the instrumental may be morphologically different to the cases of verbal nouns described in Chapter 3.1.6 (see especially footnotes 455 and 456) which describe the closely related 'state of being'. Despite the lack of a thorough comparative analysis, the instrumental and gerund in POP (as mentioned above in footnote 425) seem to share the same derivational morpheme. In contrast for at least CHL, there are indications that the 'resultative' instrumental directly originates from the verbal action, while the 'state of being' preferably comes from an intransitivised adjective. But the borders between these categories may be fluent, and different languages may have developed different preferences of how to form such derivations.

427 The example provided is particularly interesting: *patzbe*, "(a) lie" from *patz*, "to deceive". This shows that also immaterial concepts may be perceived as an instrument.

428 Considering Wichmann's (2002a: 6) categorisation, this suffix may be viewed as an instrumental as well. Also compare to the evidence from POP.

429 As Wichmann's (2002a: 6-17) work showed, the linguistics for the positional instrumental is precisely reflected in the hieroglyphs. The instrumental of positional roots by its *–l-Vb* pattern is also discernable in Yukatekan and Tzeltalan which actually allow instrumentals to be formed from both transitive and intransitive stems.

430 Underspellings of suffixed derivational morphemes might be another explanation, but as the abundant examples of spellings with syncopated suffixes show (especially the *–n-aj* of non-CVC/derived transitives), this is barely a plausible explanation.

431 Thus, not all spelling patterns described above should *a priori* be taken as an instrumental, especially when an assumed underlying stem is not a verb. Houston, Robertson and Stuart (2001b: fn. 7) describe several in-

As the majority of the data for the Yukatekan branch suggests, we may expect a rather uniform phonology in the hieroglyphs and can assume a pYu *–V_1*b* suffix predominantly among root transitive verbs. The allomorph *–eb* occurs after preceding suffixes. Tzeltalan is less uniform. While in modern TZE the trend is to exclusive use *–(h)ib* and in TZO only *–ob* ~ *–ab*, we have the full range of vowels in pTz. The data are not very clear, but the front vowels are not described with transitive verbs and may be preferred to intransitive roots. As in Yukatekan, *–eb* is used after the *–l* intransitiviser of positional stems.

The implications of the nature of the verbal basis in ClM reaches even beyond orthographic problems. A comparison with the data from Yukatekan, Tzeltalan und Greater Q'anjobalan shows that the exclusive intransitive basis for instrumental derivation is a Ch'olan peculiarity[432] and thus an inno-

stances of =**ni-bi** / __# spellings they assume to be instrumentals (e.g. TPX MV 55, P1-Q1, R1, S1 [Fialko 2000: 148, fig. 103]). Two of the examples, **TE'**=**ni-bi** and **TOK'**=**ni-bi**, combine the sign string with a preceding noun morphograph, suggesting a nominal compound rather. Moreover, on XUN P. 2, pC2-pB3, the two examples combine with **K'UH** as theonyms, which Hull (2012: fig. 3.5) associates with the *tok'-pakal* kenning and translates as "wood-place god" and "flint-place god". TPX MV 55, P1-Q1 seems to be an instrumental indeed, if one counts it among the substitutions of the **JAGUAR.EYE**=**Ci**=**bi** collocations (Boot 2009a: 6-7) discussed in Chapter 4.1.17. Houston, Robertson and Stuart (2001b: fn. 7) think of an underlying nominalised form and cite CHR *burut*, "baked, fired, burned" and *burutnib*, "kiln" (Wisdom 1950: 593). While we have *b'ujr*, "earthenware jar, pot" (Hull 2005: 12), a verbal explanation is much more likely to not violate the morphosyntactic premises: *burta*, "[*p'urut-a*] bake, fire (as pottery or lime)" as a derived transitive verb (Wisdom 1950: 593), also compare to (acknowledging that Wisdom's data frequently have /b/ ~ /p/) VER.INTR *puruy*, "burn, burn down" and VER.TR *puta*, "burn, sting" (Hull 2005: 98). An instrumental is uncertain in **ja-na-bi** ~ **JAN(AB)-bi** < *janab*, after an underlying stem *jan* (cf. CHL *jan*, "flor de maíz" [Aulie and de Aulie 1978: 40]) has been assumed (Gronemeyer 2006a: 5). Another case concerns the **a-na**=**bi** < *a[h]nab* epithet (e.g. PNG P. 3, J'1). We have a hieroglyphically attested intransitive **a-ni** < *a[h]n* as "to run" (e.g. YTS Dwg. 1, E1), which Beliaev (2004: 127) sees with an *–ab* agentive (*a[h]n-ab*, "runner"), similar to the *way-ab*, "dreamer" title. I had proposed to consider the latter form as an instrumental as well (Gronemeyer 2011b: 331), as the person is a mediator for the verbal action. Such view would qualify 'animated instrumental' versus physical objects. But I would also consider an agentive (although not spelled with 1G4 **AJ**, but AL2 **a** already came in use by that time in the Usumacinta region) of *na[h]b*, "hand-span" (Macri and Looper 2000, Zender 2004a) as a ballplayer title; while MacLeod bases on YUK *nab*, "daub, anoint" (MacLeod and Stone 1994: 174), and Sheseña (2008) on *na[h]b*, "lake". Houston, Robertson and Stuart (2001b: fn. 7) consider it as an instrumental from *(h)a'*, "water", but instrumentals do not derive from nouns in Ch'olan. Furthermore, this interpretation would need to explain the loss of the onset [h], which is known to be elided in two cases only: (1) upon possession (e.g. compare YUK *ha'*, "agua" with *yaa'l ich*, "lágrimas de los ojos" [Barrera Vásquez 1993: 165], also refer to Yoshida [2013: 9-15] for a discussion of /h/ representations in Colonial YUK orthography), and (2) in nominal compounds when preceded, and then predominantly in the central and eastern Petén (Stuart and Houston 1994: 52). Another instance concerns the word for "stone lintel", *pakbu tun*. The spelling for *pak*, "to turn over" (compare to the intransitive **pa-ka**=**la-ja** < *pak-laj*, K4331, D1) is often realised as **pa-ka**=**ba** (e.g. CHN LM Lnt. 2, C5) or **pa-ka**=**bu** (e.g. COL P. Kansas, D4-D5). Questioning an earlier analysis (Gronemeyer 2011b: 331, fig. 6f-h), one might rather expect ****pa-ka**=**li**=**bi** < *pak-l-ib* as the instrumental. While Wichmann (2002a: 16-17) attested a spelling without a preceding intransitiviser (**u**=**CHUM**=**bi** < *u-chum-[i]b*, CPN Str. 10K Hbh., E1), this late example only fits the unique CHR pattern. Positional stems sometimes (Knowles [1984: 75] mentions up to 50% in CHN) behave like transitives (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 353, Hopkins 1967a: 76, Wichmann 2002a: 7-8), so some other intransitiviser should then precede an instrumental. The most likely explanation is the *–bV* causative or transitiviser of positionals. While mostly considered as *–bu* in ClM (cf. Lacadena 2000a: 166, fn. 11), ECh also has *–ba* ~ *–bi* (Kaufman and Norman 1984: 106) and we can reconstruct pCh *–*b'a* < pM *–V_1*b'a'* (cf. Mora-Marín 2009: 128-130). We have *pak-bu*, "to place face down" attested in CHR (Kaufman and Norman 1984: 106), so **pa-ka**=**bu** provides a Ch'olan spelling for *pak-bu*, while **pa-ka**=**ba** from Chichen Itza might reflect a Yukatekan *pak-ba*. Lacadena (2000a: fn. 12) provides an interesting case on CPN Alt. Z, D3, where a transitive positional may function as a noun (see footnote 357), so the full ClM phrase for "lintel", *u-pak-bu[h-i?]-tun-il* may literally read "his face-down stone" as a nominal compound.

432 Members of EM likewise show a broad derivational basis for the instrumental. In KCH for example, there are three closely related suffixes (Sachse and Siis Ib'ooy 1997: 12-14): (1) *–b'al* is for nouns and derived transitives

vation. The question to what extent pCh already reflects this development has not yet been answered[433]. Due to the relative similarity of instrumentals in WM branches, no specific vernaculars except the CHR instrumental (Wichmann 2002a: 16-17) have yet been described. The patterns with **=ji-bi** / __# described by Boot (2004a) for a specific vessel type may be ancestral to an ECh pattern or reflect the instrumental of non-CVC forms (see footnote 402), while Boot considered semantic implications. Likewise, additional, hitherto unspecified verbal environments may have existed in ClM[434].

Branch	**Paradigm**	**Spellings**	**Schemes**
Common Ch'olan	*√-ib / √<h>-ib*	**CV$_1$-Ci=bi / CV$_1$C(-Ci)=bi**	1.a,b,c,d.i (3.a.i)
		CV$_1$-(C)V$_1$=i-bi / CV$_1$C=i-bi	1.e.1
	√-[i]b	**CV$_1$-CV$_1$=bi / CV$_1$C(-CV$_1$)=bi**	3.a.i
	√-ab / √<h>-ab	**CV$_1$-Ca=bi / CV$_1$C(-Ca)=bi**	1.a,b,c,d.ii (3.a.ii)
		CV$_1$-Ca=ba / CV$_1$C(-Ca)=ba	1.a,b,c,d.i (2.e.i)
		CV$_1$C=a-bV	1.e.i
	√-[a]b	**CV$_1$-CV$_1$=ba / CV$_1$C(-CV$_1$)=ba**	3.a.i
	√-V$_2$b / √<h>-Vb	**CV$_1$-CV$_2$=bi / CV$_1$C(-CV$_2$)=bi**	1.a,b,c,d.ii (3.a.ii)
		CV$_1$-CV$_2$=bV$_2$ / CV$_1$C(-CV$_2$)=bV$_2$	1.a,b,c,d.i (3.a.i)
		CV$_1$C=V$_2$-bV$_2$	1.e.i
	√-[V$_2$]b	**CV$_1$-CV$_1$=bV / CV$_1$C(-CV$_1$)=bV**	3.a.ii
	* *√-on-ib*	**CV$_1$-Co=ni=bi / CV$_1$C(-Co)=ni=bi**	1.f.ii
	* *√-n-ib*	**CV$_1$-CV$_1$=ni=bi / CV$_1$C(-CV$_1$)=ni=bi**	1.f.ii
	√-l-ib	**CV$_1$-CV$_1$=li=bi / CV$_1$C(-CV$_1$)=li=bi**	1.f.ii
Eastern Ch'olan	(*) *√-(V$_2$)j-ib*	**CV$_1$-CV$_2$=ji=bi / CV$_1$C(-CV$_2$)=ji=bi**	1.f.ii
	(*) *√-V$_2$-[i]b*	**CV$_1$-CV$_2$(-V$_2$)=bi / CV$_1$C(-V$_2$)=bi**	3.a.ii

(while nouns feature a vocalic epenthesis), (2) *–V$_1$-b'al* for root transitives and positional roots, and (3) its allomorph *–i-b'al* is restricted to intransitives and adjectival positionals. Still more simple is the *–b'il* instrumental in the very conservative MAM (England 1975: 108), directly applicable to transitive, intransitive and positional roots.

[433] See footnote 404 for some preliminary discussion. Barbara MacLeod (written communications, October 11 and 20, 2011) speculates on a pYu substratum in the script, as exemplified by *y-uk'-ib*, but also other phonological traits from either before the pGT *[ʧ/ʧ'] < pM *[k/k'] shift (Kaufman and Norman 1984: 83-84) and/or influenced by early pYu stages, e.g. the word *kan* by ^{ka}**KAN** in the Calakmul emblem glyph instead of pCh **chan* (Grube 2004b: 118-119, Martin 2005b: fn. 2) or **ka-ba** < *kab*, "earth" instead of a theoretical native ***chab* (which was indeed pCh **kab*). In MacLeod's view, the emergence of hieroglyphic writing in the Lowlands (see Chapter 1.1) was possibly influenced by pYu speakers occupying this area in the Pre-Classic. Therefore, a lexical, grammatical and phonological inventory percolated into an otherwise pCh sphere and eventually got fossilised. Certain features therefore should not be the result of a pM retention, but vernacular influences (also see Chapter 3.2.1). A meticulous investigation of certain grammatical forms (not necessarily restricted to the instrumental) might answer the question, especially among Late Pre-Classic and Early Classic texts.

[434] Compare to **CHAK-ka=ja=li=bi** on CNC P. 1, E7, which can be transcribed as *chak-aj-l-ib*. As mentioned earlier, Wichmann (2002a: 7-8) had discussed the positional instrumental *chak-l-ib* as "prisoner" on TNA Mon. 27, B2 from the otherwise transitive root *chak*, "to tie" in CHT. As Kerry Hull (written communication, October 19, 2011) pointed out, CHL has a *–Vj* detransitiviser. For example, the transitive root *pʌc'*, "sembrar" yields a 'resultative' noun *pʌc'ʌbʌl*, "hortaliza" and an instrumental *pʌc'ojib*, "macana (palo con punta para sembrar maíz" (Aulie and de Aulie 1978: 69, 70). Also compare VER.TR *misun*, "barrer" with VER.INTR *misujel*, "barrer" and the instrumental *misujib* "escoba" (Aulie and de Aulie 1978: 58). I support Wichmann (2002a: tab. 1) who has tentatively classified this suffix as an antipassive. He provides further evidence from CHR (Wichmann 1999: 12) of *–uj* and *–oj* antipassives, e.g. *mes-uj*, "to sweep" < *mes*, "to clean" or *man-oj* < *man*, "to buy". It is apparently the same suffix involved in other nominalisations (Table 56), also see footnotes 436 and 441 for further consideration. We seem to have the same suffix in the Cancuen example, as the explicit spelling by **ka=ja** for *–aj* does not indicate a passive, as the thematic suffix would get replaced by the instrumental (see footnote 409). The suffixation with the instrumental *–l-ib* then is apparently a 'double' intransitivation and may further exemplify the blur between positional and transitive roots. Also refer to footnote 174 for the vocalisation of *–l-ib*.

Western Ch'olan	* √-*k-ib* (*) √-*(V$_2$)j-ib*	**CV$_1$-CV$_1$=ki=bi / CV$_1$C(-CV$_1$)=ki=bi** **CV$_1$-CV$_2$=ji=bi / CV$_1$C(-CV$_2$)=ji=bi**	1.f.ii 1.f.ii
Yukatekan	* √-*V$_1$b* * √-*l-eb*	**CV$_1$-CV$_1$=bi / CV$_1$C(-CV$_1$)=bi** **CV$_1$-CV$_1$=bV$_1$ / CV$_1$C(-CV$_1$)=bV$_1$** **CV$_1$C=V$_1$-bV$_1$** **CV$_1$-CV$_1$=le=bi / CV$_1$C(-CV$_1$)=le=bi**	1.a,b,c,d.ii 1.a,b,c,d.i 1.e.i 1.f.ii
Tzeltalan	* √-*V$_1$b* * √-*l-eb*	**CV$_1$-CV$_1$=bi / CV$_1$C(-CV$_1$)=bi** **CV$_1$-CV$_1$=bV$_1$ / CV$_1$C(-CV$_1$)=bV$_1$** **CV$_1$C=V$_1$-bV$_1$** **CV$_1$-CV$_1$=le=bi / CV$_1$C(-CV$_1$)=le=bi**	1.a,b,c,d.ii 1.a,b,c,d.i 1.e.i 1.f.ii

Table 55: Representative, linguistically induced spelling patterns on junctures to be expected for the derivational instrumental suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.6 – Control Group 3: Nominaliser Suffix *–Vl*

The mechanisms of Ch'olan noun derivation out of (predominantly) verbal roots has not yet satisfactorily been described in the literature, especially for ClM (cf. Lacadena and Wichmann 2005b: 28 for an orthographic approach), nor are any reconstructions for pCh or ECh in place. As the compilation of grammatical and lexical data (Table 56) demonstrates, the derivational patterns do not differ too much from those described above for the instrumental (Chapter 3.1.5). The final [l] can be confirmed by all four languages (with CHR [l] ~ [r]), while the default vowel is apparently [e], likewise attested in all Ch'olan languages as well. Other vocalisations seem to be conditioned to some extent by the lexical class being derived, but before detailing this further, it is apt to first consider the derivational bases and patterns.

Like Wichmann (2002a: 11-15) has demonstrated for the instrumental, basically only intransitive forms may serve as the derivational basis for the *–Vl* suffix, otherwise a transitive or positional root needs to be intransitivised first[435]. The necessity for intermediate derivational suffixes can best be demonstrated by CHT evidence (Sattler 2004: 385-386), intransitives are nominalised by *–el*, transitives by *–o(j)-el* or *–a(j)-el*, and these antipassive suffixes can be found in CHN and CHL and as *–o(n)-er* in CHR[436]. A prior passivation (see Chapter 3.1.1.1) by the derivational infix is also attested, and the vocalisation shows some greater variety in these cases (see footnotes 445 and 447), but at least CHR shows, induced by the thematic suffix, a tendency for *–a'r* < **–a-ar*, so there is at least one environ-

[435] See footnote 446 for one exception from CHR, otherwise see Wichmann (1999: 111) on prior intransitivation in CHR. On the other hand, I only found few indications from CHL that suggest transitives to take the *–Vl* suffix without prior intransitivation. Compare the following cases: *ajcʌchol* (dialectal), "preso" (Aulie and de Aulie 1978: 4) < VER.TR *cʌch*, "amarrar" (Aulie and de Aulie 1978: 14) and (standard) *xcʌjchel*, "preso" (Aulie and de Aulie 1978: 113) < detransitivised *cʌjchel*, "amarrarse" (Aulie and de Aulie 1978: 14); also *tojolan*, "pagar" with *tojol*, "precio, vallor, paga" and the previously antipassivised *tojoñel*, "impuesto" (Aulie and de Aulie 1978: 90). Possibly, only certain allomorphs of the suffix may be able to derive from a transitive root, and this may be a CHL peculiarity (but see footnote 465 for TZE) to increase the semantic productivity (see below).

[436] This parallels the CHL *–Vh-ib* antipassive suffix noted by several scholars (Table 51, footnote 434). As *–Vn* is otherwise known as an antipassive derivation (cf. Lacadena 2000a), CHT, CHN, CHL *–{o, a}j-el* can be equated with CHN *–n-el* and CHL *–oñ-el* (also see footnote 444). Despite the lexical evidence in Table 56, we might assume a larger vowel variety for ClM than *–{o, a}j-el* (also see footnote 129 on intransitivisers), if we parallel to the CHL cases provided in footnote 434. Rather than being a syncopated passive nominalisation ***u-ti<h>m-j-e(')l*, I assume an underlying *–Vj* antipassive in PAL TI-W, A11-A12 **u=ti-mi=je=la** for *u-tim-(i)j-e(')l*, thus the synharmonic root spelling (see footnote 37) may not only indicate syncopation, but here in fact the suffix vowel.

ment for [Vʔ]. Apparently, *–el* (and less frequent other *–Vl* allomorphs) alone is only suffixed to root or derived intransitive forms. Other intermediate intransitivations are not described, but may be represented in Classic Mayan[437].

As the nominalisations on *–Vl* are often described as a verbal noun as well, the suffix has been connected to the homophonous *–el* marker for the incompletive of intransitives in CHT (Sattler 2004: 385) and ECh in general (Kaufman and Norman 1984: tab. 13, Storniolo 2008: 123-124)[438], and, despite the different person marking (Storniolo 2008: tab. 3.5), also in WCh[439], but also Ch'olan in general[440].

[437] Refer to footnote 404 for the case of *mesyob'* < *mesu* as a possible *–y* antipassive or mediopassive derivation. Sanz González (2006: 472-475) however describes some examples from the hieroglyphic record that involve a syncopated *–(V₁)y* mediopassive, the most obvious being **K'A'=ye=la** < *k'a'-y-el* (SCU St. 1, A8), hence the transitive root *k'a'*, "to diminish" is usually written in a mediopassive form (e.g. **K'A'=yi** < *k'a'-[a]y*, YAX Lnt. 27, A2, see also footnote 82). Other cases are however not as clear and may need further investigation (cf. the discussion of a potential **EM=ye=la** spelling on TRT Mon. 6, E10a [Gronemeyer and MacLeod 2010: 46]). Otherwise (see Table 56), such a *–(V)y-el* form has been described for CHL attributives.

[438] Interestingly, as with verbal nouns based on intermediate passives taking *–a'r* in CHR, the incompletive marking of derived intransitives in CHT (Morán 1685-95: 17) is *–al* rather, apparently also incorporating the thematic suffix (Kaufman and Norman 1984: tab. 13) from **–a-el* and an even earlier **–aj-el*.

[439] The homophony between the incompletive intransitive marker and the nominaliser has serious impact on the question whether pCh or ClM were split ergative languages. While CHR and CHT have a third set of ergative pronouns for the incompletive of intransitives, the WCh languages do not (Storniolo 2008: 123-128, tabs. 3.5, 3.6). Based on earlier assumptions regarding tense and aspect (Houston 1997: 296), Houston, Robertson and Stuart (2000: 348-349) and more recently Law, Robertson and Houston (2006) argue against split ergativity in pCh and they consider straight ergativity for it. However, without detailing the issue here, I concur with the view that split ergativity was present in pCh and ClM (Mora-Marín 2003a: 9-10, 2009: 21-22), as already proposed by Kaufman and Norman (1984: 90-92) for pCh. Certainly, in a WCh vernacular context, it may get difficult to distinguish incompletive intransitives from nominalised forms, both being inflected with the ergative pronoun (cf. Knowles [1984: 190-191] on CHN). One example of a possible incompletive verb occurs on CPN Alt. F', A3b with the intransitive *hul*, although it does not exhibit a prefixed Set C pronoun required for ECh, according to the reconstructed schemes (Storniolo 2008: 188). More likely, the spelling **HUL-le=li=ji=ya** < *hul-el-Ø=ij=iy* is a nominalised form in a stative function, either a proper noun or a gerund. Similarly vexing is a spelling on COL Shl. Berlin, A1 (Grube and Gaida 2006: Cat. No. 37), which Grube proposes to be **a=wu?-le=li=ya** < *aw-[h]ul-el-Ø=iy* as a nominalised form "after it was your coming" in a possessive phrase. Despite the problematic reading and the occurrence of the temporal enclitic, there is a possibility that this is an incompletive "after you come". Another possible and likewise problematic incompletive form with split ergativity is **u=TZ'AK=bu=nu** < *u-tz'ak-bu-n-Ø*, "he sets it in order" (COB P. C, D1) with the WCh incompletive marker *–n* of derived transitives (MacLeod 2004: 313). In any case, the incompletive *–el* suffix paradigmatically contrasts with the *–V₁y* suffix (Chapter 3.1.4) as the completive marker of certain root intransitives (Kaufman and Norman 1984: tab. 13, Mora-Marín 2009: 144). One final comment however needs to made on the question of vowel complexity. For the nominalising suffix, a glottalised vowel has been proposed in ClM (Lacadena and Wichmann 2005b: 28), often realised by **Ce=la / __#** spellings. The linguistic data show no complex vowel however for both the incompletive marker and the nominaliser (unless morphophonemically conditioned, as in CHR *–a'r* < *–a-ar*). If one follows the proposal of harmony rules within the suffix domain, it is to question whether the incompletive, if it was ever recorded, was in analogy also featuring a glottalised vowel or not, and if possibly another spelling convention was applicable (picking up the visual reading aid theory detailed in Chapter 2.5.3.2).

[440] As Coon (2010) argues, Ch'olan "nonperfective" verbal forms shall in fact represent possessed nominals. The phenomenon of split-ergativity therefore is considered as an "illusion" by the nominalisation "of the notional predicate". In Dixon's (1979: 76-77) terms, she considers the case of Mayan as an "extended ergative" (Coon 2010: 248). This way, Robertson, Law and Haertel (2010: 170) treat CHT incompletive intransitives as nominalised forms, e.g. *iyuwal-Ø in-pakxi-el*, "[o]ngoing is my returning", the same with incompletive intransitive positionals on *–tal*. This may explain why the authors do not morphologically distinguish between incompletive and completive forms in their grammar, but just acknowledge one verbal form that gets enhanced by adverbs and enclitics to indicate temporality. This model is consequent in comparison with the author's school to consider ClM texts to written in the incompletive (Houston 1997: 293-294, Houston, Robertson and Stuart 2000: 329).

Another case relevant for the vocalisation of the suffix vowel is the so-called gerund function (see footnote 455) and which apparently takes to prefer [o]. As explained further below, the functions of *–el* vs. *–ol* are not entirely the same, although both are nominalisers.

The linguistic data further suggest that *–ya(j)* (and its allomorphs) functions similarly with root and derived transitive roots. Although by its phonological shape it is not part of the test groups[441], its function and use can help to understand the *–Vl* suffix, as these suffixes are mutually exclusive as per valency of the verbal stem[442].

But *–Vl* is not entirely restricted to root or derived intransitives, if we broaden the phonemics of the suffix vowel. Thus far, the following assumptions only base on a lexical survey of CHL data (Aulie and de Aulie 1978). As detailed below (footnote 455), *–Vl* may appear with root and derived transitives

[441] Therefore, some examples from hieroglyphic texts that possibly represent this suffix should be pointed out. Stuart, Houston and Robertson (1999, II: 36) were the first to suggest such forms, e.g. YAX Lnt. 46, F9 with **u=chu-ku=ya** < *u-chuk-ya(j)*, "[t]he capture of …". These forms were later (Robertson, Houston and Stuart 2004: 284-286) considered as nominalised antipassives, a view debated by MacLeod (2004: 317-324). In accordance with MacLeod (2004: 320), but also John Robertson, I likewise consider the Colonial TZE *–oghel* cognate with CHT, CHN and CHL *–oh-el* ~ *–oj-el*. While MacLeod (2004: 319) terms *–oj* a perfective "gerundive" (cf. the forms in Table 63) that already should have served as a nominaliser (while supposed to have lost this function in Colonial TZE, hence the addition of *–el* was necessary), I would equate *–oj* ~ *–Vj* to the CHL (antipassive) detransitiviser *–Vj* (see footnotes 434 and 436) which may be cognate to the pTz (non-productive) intransitiviser ** – Vx* (Kaufman 1972: 141). Colonial TZE furthermore has *–aghel* and *–ighel* as nominalisers (Robertson, Houston and Stuart 2004: 285), which would equate in the same way as *–oghel*. Only *–egh* stands a bit apart, although I would not link it to a MCH *–eej* nominaliser und arrive at a pGT **–eej* > ClM **–ij* nominaliser (Robertson, Houston and Stuart 2004: 285) from this direction (cf. TZO *–eh* NMLS for polysyllabic verbs excluding affectives [Laughlin 1975: 25]). There is an alternative (or additional) explanation, at least for a certain amount of nominalisations. For positional and transitive roots, TZE and TZO (see Tables 13 and 48) have *–C-Vj* derivations for mediopassives and celeritives. These of course can, without loosing the *–Vj* thematic, be nominalised by *–el*. There is one interesting TZE example, *bejk'ajel*, "nacimiento" < *bejk'aj*, "nacer" (Slocum 1953: 7). The etymology is not clear, as no dictionary lists a root ***bej*, but it may be connected to *be*, "camino", which becomes *beh* ~ *bej* when derived, e.g. compare to *behts'ebajel*, "caminar a" (Slocum and Gerdel 1971: 120). Other *–C-Vj* derivations might also factor in, as *chik'majel*, "quemazón (de milpa)" < *–chik'*, "quemar" (Slocum 1953: 11) suggests. This form involves the *–(o)maj* antipassive (see Table 43). As far as the *–ya(j)* is concerned, Robertson, Houston and Stuart (2004: 285) as well as MacLeod (2004: 323) provide the alternative spellings **ya / __#** and **ya-ja / __#**. I am rather inclined with MacLeod's (2004: 322-323) view than with Robertson, Houston and Stuart (2004: 285) that *–ij* was augmented by *–ya* to provide a merged nominalised antipassive ** *–ij-ya(j)*. As a ClM example, Robertson, Houston and Stuart (2004: 285) cite YAX Lnt. 22, A3-B3 **yi=pi=ya-je=la**, which I analyse as *y-ip-yaj-el*, '3SG.ERG-fill.up-NMLS-NMLS', "its filling up", following MacLeod (2004: 323). Robertson, Houston and Stuart (2004: 285) consider their *–yajeel* segmentation as an innovation (by adding *–y*) to the otherwise cognate TZE *–ajel*. In fact, this example presents a morphological conundrum. According to the Ch'olan evidence, *–ya(j)* itself is sufficient to nominalise a transitive verb (which *ip-a* is), hence *–el* would not be necessary. Compare to the name of Copan's 15th ruler, *K'ahk' Yipya(j) Chan K'awil*, which we find fully realised as **K'AK' yi=pi=ya-ja CHAN**^{na} **K'AWIL**^{la} e.g. on CPN St. M, B5-B7. Grammatically, it is considered a focus antipassive (MacLeod 2004: 323), and many names of the pattern *K'ahk' VER.TR-ANTIP Chan GOD* are widely known (cf. Krempel and Davletshin 2011: 29), suggesting an otherwise unattested *–y* antipassive (see footnote 326). While a mediopassive (see footnote 437) may also be possible for *–y*, it seems unlikely here. If we take the following *–aj* as a thematic, it could explain the occurrence of *–el* as the nominaliser of a (derived) intransitive, otherwise it may serve as an allomorph to the proposed **–ij* nominaliser. These cases definitely require more investigation to clarify their morphology. Likewise, the case of **u=chu-ku=ya** as ***u-chuk-ya(j)* mentioned first is also not beyond doubt, as the **ya** there rather renders the temporal enclitic *=iy* (MacLeod 2004: 323) with an underspelled perfective suffix. The text mentions how *Itzamnaj Bahlam* II took a captive and then refers back to the capture of an individual by the Middle Classic king Knot-Eye Jaguar II, in a secondary verbal statement, predestined for a perfect. Also refer to Chapters 4.1.5 and 4.1.19 for further discussion.

[442] This is best demonstrated by CHT, where *–ya* is directly used with root and non-CVC transitives (Sattler 2004: 386) and where it contrasts with the *–oj-el* intransitivising scheme with the same root. The word "creator", based on the transitive root *k'al*, appears both as <*ahcalia*> (Morán 1685-95: 65) and <*a[h]calohel*> (Morán 1685-95: 59) in the sources.

to form a gerund, a verbal noun maintaining its original meaning, while with root and derived intransitives, it forms a noun with a new, but related meaning. One supporting argument is that there are only very few lemmata of direct *–Vl* nominalisations from transitive verbs, opting for a grammatical construction rather than a productive word production. Therefore, it is not an exclusive pattern, but a preference, and certain gerunds may have found lexicalisation. The morphology of root and derived intransitives draws a lexical and morphological parallel to the instrumental[443]. This might also explain the existence of the *–ya(j)* suffix for root and derived transitives: if *–Vl* is chiefly used for the gerunds of transitives (which is less a word formation than a morphosyntactic shift), then *–ya(j)* can take the function which *–Vl* has for intransitives: to derive a word with a new meaning.

Apparently, the semantics and morphophonemics of nominalisations have not yet been fully understood. When the nominalisation as a derivational process parallels the instrumental, different suffixes may represent (subtle) differences in meaning, but yet the lexical evidence does not support this idea[444].

Idiom	Attestations		Sources
pCh	n/a		
ECh	n/a		
CHT	*-Vl*	NOUN < PASS < VER.TR	(MacLeod 1987: fig. 9)
CHT	*-el*	NOUN < VER.INTR	(Sattler 2004: 385-386)
CHT	*-el*	NOUN < VER.INTR	(MacLeod 1987: fig. 9)
CHT	*-el*	GER < VER	(Bricker 1986: tab. 20)
CHT	*-el*	GER,PTCP < VER [+INC]	(Kaufman 1994, A 3b: 29)
CHT	*-a'l*	NOUN < PASS < VER.TR.R	(Robertson, Law and Haertel 2010: 186)
CHT	*-al*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHT	*-il, -Vl*	NOUN < PTCP < VER	(MacLeod 1987: fig. 9)
CHT	*-ojel*	NOUN < VER.TR.R	(Sattler 2004: 386-387)
CHT	*-oh-el*	NMLS	(Bricker 1986: tab. 20)
CHT	*-o(h)-el, -ah-el*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHT	*-ya*	NOUN < VER.TR	(Sattler 2004: 386)
CHT	*-ya*	NMLS	(Bricker 1986: tab. 20)
CHT	*-y-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 9)
CHR	*-Vr*	NOUN < VER.INTR.R	(MacLeod 1987: fig. 9)
CHR	*-er*	NOUN < VER	(Storniolo 2008: 124)
CHR	*-er*	NOUN < various roots	(Hull 2005: 122)[445]
CHR	*-er*	NOUN < VER (state/direction)	(Oakley 1966: 245)
CHR	*-ar*	NOUN < VER.TR.D	(Hull 2005: 121, 123)[446]

[443] Bricker (1986: 45) also put forward a generalised rule that Ch'olan requires root or derived intransitives as the basis for nominalisations. Compare the CHL case of the transitive *lʌw*, "remendar" that derives nouns via an intermediate antipassivation, hence we have the instrumental *lʌwonib*, "remiendo" and the verbal noun *lʌwoñel*, "actividad de remendar ropa" (Aulie and de Aulie 1978: 50), although the latter's description almost prompts a gerund.

[444] Compare to the case of CHT *aj k'alyaj ~ aj k'alojel* mentioned above (footnote 442), and also to a lesser degree (as both are intransitivations) with CHL *melojel ~ meloñel*, "proceso" < *mel*, "hacer" (Aulie and de Aulie 1978: 57).

[445] Hull summarises several morphological surroundings for this allomorph: (1) intransitive verbal roots , e.g. *ocher*, "entrance" < *ochoy*, "enter" (Hull 2005: 90), (2) antipassives in *–on*, e.g. *b'a'xoner*, "curse" < *b'a'xi*, "bewitch" (Hull 2005: 9), and (3) passives in *–n*, e.g. *k'uxner*, "pain" < *k'uxi*, "bite, sting" (Hull 2005: 77).

[446] The only example attributed by Hull to this type of nominal derivation is *tz'ijb'ar*, "letter, picture, drawing; stripe" as well as "colour" (Hull 2005: 110), apparently based on the derived transitive *tz'ijb'a*, "write" (see also footnote 83). In Hull's data, this is the only example of a nominalisation from a (derived) transitive base, all other occurrences involving *–ar* are from derived transitives as ~ *–a'r* (see footnote 447).

CHR	*-a'r*	NOUN < VER	(Oakley 1966: 245)[447]
CHR	*-ar ~ -a'r*	NOUN < VER.INTR	(Wichmann 1999: 111)
CHR	*-ir*	NOUN < ADJ	(Hull 2005: 122)
CHR	*-ir, -ar*	NOUN < PTCP < VER	(MacLeod 1987: fig. 9)
CHR	*-or, -ur*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHR	*-er ~ -ar*	NOUN < VER.TR	(Fought 1967: 190, 217-218)
CHR	*-V-ar*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHR	*-o-ar*	NOUN < VER.TR	(Wichmann 1999: 61-62)
CHR	*-on-er*	NOUN < VER.TR	(Wichmann 1999: 62-64)
CHR	*-h-…-ir*	NOUN < VER.TR	(MacLeod 1987: fig. 9)
CHR	*-a'r, -yaj*	NOUN < VER	(Ch'orti' 2004: 142)[448]
CHR	*√IAH*	NMLS	(Fought 1967: 237-238)
CHR	*-yah*	NMLS	(Bricker 1986: tab. 20)
CHR	*-(y)-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 9)
CHR	*-iah ~ -yah*	NOUN < VER.TR.D [+CAUS]	(Oakley 1966: 245)
CHR	*-Vm*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHR	*-Vn*	NOUN < VER.TR.R	(MacLeod 1987: fig. 9)
CHN	*-ol ~ -al*	GER < VER.TR	(Smailus 1975: 160, 199)[449]
CHN	*-al, -ol*	NOUN < VER.TR.R	(MacLeod 1987: fig. 23)
CHN	*-o*	NMLS	(Keller and Luciano 1997: 429)
CHN	*-ibal*	GER < VER.INTR	(Smailus 1975: 145, 199)
CHN	*-b'al*	NOUN < INTRS < VER.TR.R	(MacLeod 1987: fig. 23)
CHN	*-e(l)*	NOUN < AFF	(Knowles 1984: 180)
CHN	*-e*	NOUN < ATTR	(MacLeod 1987: fig. 18)
CHN	*-h-el*	NMLS < VER.TR	(Bricker 1986: 45, tab. 20)
CHN	*-Vhe(l), -Vha(l)*	NOUN < NOUN	(Knowles 1984: 175)[450]
CHN	*-Vh-e*	NOUN < PTCP < VER	(MacLeod 1987: fig. 18)
CHN	*-n-el*	NMLS < VER.TR	(Bricker 1986: 45, tab. 20)
CHN	*-a, -ia, -ya, -aya*	NMLS < VER.TR	(Keller and Luciano 1997: 428)[451]
CHN	*-a, -ah*	NOUN < VER.TR.D	(Knowles 1984: 186-187)
CHN	*-ah*	NOUN < VER.TR.D [+CAUS]	(MacLeod 1987: fig. 14, 18)
CHN	*-(a)ya*	NMLS	(Bricker 1986: tab. 20)
CHN	*-(a)ya*	NOUN < VER.TR.D [+CAUS]	(Knowles 1984: 187-188)
CHN	*-(a)y-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 18)
CHN	*-om*	NOUN < VER.TR.R	(Keller and Luciano 1997: 429)[452]
CHN	*-Vn, -Vm*	NOUN < NOUN	(MacLeod 1987: fig. 14)
CHL	*-al, -ʌl, -el*	NOUN < VER.TR.R	(MacLeod 1987: fig. 18)[453]
CHL	*-el ~ -lel /V__*	NMLS	(Attinasi 1973: 153-154)[454]

447 This form is basically a contraction of *–a-ar* as the participle/nominalisation of a detransitivised verb (Lacadena 2004b: fn. 119) involving the thematic marker (see Chapter 3.1.1.1), e.g. the passive *mu<j>k-a*, "be buried" becomes *mu<j>k-a'r* < **mu<j>k-a-ar*, "burying". Hull (2005: 121, 123) further includes antipassives in *–{w, m}-a'r* < **–{w, m}-a-ar*, non-CVC passives in *–(es)-n-a'r* < **–(es)-n-a-ar* (eventually involving a causative) and mediopassives in *–p-a'r* < **–p-a-ar*. See for example Fought (1967: 190) with *'pat"naʔar*, "working" and *'ʔkam"paʔar*, "using". The same morphophonemic process was eventually applicable for CHT nominalisations of passives and incompletive passive forms (Robertson, Law and Haertel 2010: 186).

448 All examples given have a mediopassive basis, therefore the nominaliser suffix always appears glottalised (see above), e.g. *xurma'r*, "cortar". There is however one example which also involves *–yaj* otherwise restricted to transitives: *kopmayaj*, "recoger" ~ *kopma'r*.

449 Apparently, the allomorph *–al* is given preference (Smailus 1975: 199) when the root vowel is /a/, although such forms can also take *–ol* (e.g. <*thanol*>).

450 Intermediate verbal forms may be involved, cf. the CHL evidence in footnotes 456 and 457. Some examples are similar, as e.g. *k'in-ihe*, "time" < *k'in*, "day, sun".

451 This suffix indicates the action of the verb, e.g. *tzämsa*, "asesinato" < *tzämsen*, "matar". Apparently, *–a* and *–ia* appear with causatives in particular, while the others are attached to root transitives.

452 The *–om ~ –Vm* suffixes must not be confused with the agentive suffix. They indicate the action of a verb, e.g. *tz'utz'om*, "beso" < *tz'utz'än*, "besar".

453 The allomorph *–el* must not, as outlined above, be confused with the functionally different *–el* to derive intransitives from a transitive root (Aulie and de Aulie 1978: 35), or more precisely, the incompletive intransitive marker. Compare *ch'ʌc*, "maldecir" with the antipassive *ch'ʌcojel*, "maldecir" and the derived noun (via an antipassive) *ch'ʌcoñel*, "hechicería" (Aulie and de Aulie 1978: 30-31).

CHL	*-al*	NOUN < PTCP < VER	(MacLeod 1987: fig. 18)
CHL	*-öl*	NOUN < VER.TR	(Schumann Gálvez 1973: 27)
CHL	*-ol*	NOUN < VER.TR.R	(MacLeod 1987: fig. 14, 18)
CHL	*-ol*	NOUN < VER.TR.R	(Aulie and de Aulie 1978: 67)[455]
CHL	*-ol*	NOUN,GER < VER	(Kaufman 1994, A 3b: 28)
CHL	*-ol*	GER < VER.TR.R	(Attinasi 1973: 228)
CHL	*i-…-ol*	GER < VER	(Attinasi 1973: 153, 156)
CHL	*-h-…-il*	NOUN < VER.TR.R	(MacLeod 1987: fig. 18)
CHL	*-ʌy-el, iy-el*	NOUN < ATTR	(MacLeod 1987: fig. 14, 18)
CHL	*-ʌh-el*	NOUN < ATTR	(MacLeod 1987: fig. 14, 18)
CHL	*-ajel ~ -ʌjel*	NOUN < ATTR,NOUN,VER.TR	(Aulie and de Aulie 1978: 4)[456]
CHL	*-ah-el*	NOUN < INCH	(MacLeod 1987: fig. 18)
CHL	*-ijel ~ -iya*	NOUN < NOUN	(Warkentin and Scott 1980: 19)[457]
CHL	*-ejel*	NOUN < NOUN	(Schumann Gálvez 1973: 27)
CHL	*-oh-el*	NMLS < VER.TR	(Bricker 1986: 45, tab. 20)
CHL	*-oh-el, -ʌh-el*	NOUN < VER.TR.R	(MacLeod 1987: fig. 18)
CHL	*-ojel*	NMLS < VER.TR	(Warkentin and Scott 1980: 20)
CHL	*-oñ-el*	NMLS < VER.TR	(Bricker 1986: 45, tab. 20)
CHL	*-oñel*	NMLS < VER.TR	(Warkentin and Scott 1980: 20)
CHL	*-on-el*	NOUN < VER.TR.R	(MacLeod 1987: fig. 18)
CHL	*i-…-Vnt-el*	GER < VER	(Attinasi 1973: 153)
CHL	*-V-ntel*	GER < VER / V = THEM [+PST]	(Attinasi 1973: 228)
CHL	*-ya*	NMLS	(Bricker 1986: tab. 20)
CHL	*-ya*	NMLS < VER.TR	(Warkentin and Scott 1980: 20)
CHL	*-(a)y-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 14, 18)
CHL	*-oj*	NOUN < VER.TR	(Schumann Gálvez 1973: 27)
CHL	*-bal*	NOUN < VER.TR.R	(Warkentin and Scott 1980: 20)
CHL	*-b'al*	NOUN < VER.TR.R	(MacLeod 1987: fig. 14, 18)
CHL	*-bal*	GER < VER.INTR	(Attinasi 1973: 228)

Table 56: Ch'olan forms for the verbal nominaliser suffix.

[454] By the examples given, it is not entirely clear to judge how the morphophonemic rule *–lel* / V__ applies. For example, *bi:lel*, "journey, going, pathway" < √*bi:*, "path" is nominal already and otherwise attested as *bij* (Aulie and de Aulie 1978: 10). Without any verbal evidence, *–lel* is rather not an allomorph to *–el*, but the abstractive also described in hieroglyphic writing (Zender 1999: 108-111). Other examples provided by Attinasi also do not pertain to the nominaliser, but are the part/whole possession marker (footnote 251).

[455] The complete description is: "[s]ufijo que se presenta con raíces transitives para formar una raíz sustantiva que sirve como infinitivo. Se usa con una expresión verbal que significa *saber haber*; p. ej.: *Yujil i c'ajol* Sabe tapiscar maíz." This complies with the gerund function described by Attinasi (1973: 156) and also for other forms attested in the Ch'olan branch. In formation and use, it is thus similar to the English gerund, which adds *–ing* to the verbal stem, e.g. *to read* > *the reading*. Such a use in ClM seems to be embedded in an *(u-bah) ti* prepositional structure (Macri 1991), e.g. **ti CHOK-ko=la** < *ti chok-o(')l*, "while/of/in scattering" (CRN Msc. 2, A3), but also **ti JOY-ye=la** < *ti joy-e(')l*, "while/of/in encircling" (YAX Lnt. 26, T1). MacLeod (1987: fig. 15) also noted the occurrence of such verbal nouns in auxiliary constructions in CHL. It thus must not be confused with the same nominalisation to derive nouns with a related meaning to the verbal base, e.g. **yo=che=la** < *y-och-e(')l*, "its entrance" (TIK MT. 176, T2) or **u=ti-mi=je=la** < *u-tim-(i)j-e(')l*, "its satisfaction" (PAL TI-W, A11-A12).

[456] This suffix is said to derive nouns that indicate a state of being, e.g. *c'amʌjel*, "enfermedad" from *c'am*, "enfermo" (Aulie and de Aulie 1978: 19). I would tend to analyse this suffix and its allomorph(s) in various ways, depending on the root it is attached to. The example can be segmented as *c'am-ʌj-el* with an inchoative suffix (see Chapter 3.1.1.3) to derive an intransitive verb first (MacLeod 1987: fig. 18). Another example is *p'olmʌjel*, "mercancía" from the transitive root *p'ol*, "engendrar, producir" (Aulie and de Aulie 1978: 77). It is difficult to analyse, but we have *–m-a* as the ECh "habitual" antipassive derivation (see footnote 136) and *–m-ʌ* as a completive inchoative via an archaic *–Vm* participle (MacLeod 1987: fig. 15). The /j/ may serve as an epenthesis for the following nominaliser or in fact be a reflex of an earlier **–m-aj*. In any case, the intermediate form seems to be intransitive.

[457] In addition to *–ajel* (footnote 456) an obvious allomorph serves to derive a noun with an altered meaning from a nominal root, e.g. *q'uinijel*, "fiesta" < *q'uin*, "día" or *lotiya*, "engaño" < *lot*, "mentira". Here, *–ij* might serve as a generic intransitiviser, before *–el* forms a noun again.

In morphology, the nominalisations from verbal roots in Yukatekan (Table 57) also parallel the instrumental, mostly in concordance with the Ch'olan languages. As with them, Yukatekan allows the nominalisation from transitive roots as well, and there also seems to be a preponderance for transitive roots. Modern YUK also has a special role within the language family, as it can use antipassive forms (Bricker 1986: 40) following the CVC > CV̀VC paradigm as verbal nouns when these take *–Ø* (or occasionally *–il*) as their possessive suffix (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 362-363)[458].

Phonologically, two forms can be generalised. Due to the fact that transitives may serve as the derivational basis, Yukatekan distinguishes *–Vl* for root transitives and intransitives and *–aj* for derived transitives. Furthermore, we have *–ik* attested solely for root transitives (cf. Mateo Pedro 2009: 55-56). The vowel of the *–Vl* shows a broad variability among the four members of the language family, although ITZ and MOP seem to prefer [a] and [i], LAK and YUK [u]. The *–el* allomorph seems to be restricted to the gerund function – thus contrasting the situation among the Ch'olan idioms, although other allomorphs may also serve to derive the gerund (e.g. ITZ). For derived transitives, the suffix vowel apparently is fixed to [a].

As within the Ch'olan group, a *–*V_1l suffix is known among ITZ (Schumann Gálvez 1971: 44), YUK (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 344) and MOP (Schumann Gálvez 1997: 113) to mark the incompletive/imperfective of root intransitive verbs.

Idiom	Attestations		Sources
ITZ	-V_1l	NOUN < VER (active)	(Hofling and Tesucún 2000: 105)
ITZ	*-al*	NOUN < VER.TR.R	(MacLeod 1987: 42)
ITZ	*-il*	NOUN < VER.TR.R	(MacLeod 1987: 42)
ITZ	*-ah*	NOUN < VER.TR.D	(MacLeod 1987: 42)
ITZ	*-al*	NOUN < VER.TR.D	(MacLeod 1987: 42)
ITZ	*-el*	GER < VER	(Bricker 1986: tab. 19)
ITZ	*-il*	GER < VER	(Hofling and Tesucún 2000: 107-108)
ITZ	*-en*	GER < VER	(Bricker 1986: tab. 19)
ITZ	*-el*	1st order derivational suffix	(Schumann Gálvez 1971: 43)
MOP	*-Vl*	NMLS < VER.INTR	(Ulrich and Ulrich 1966: 262)
MOP	*-al*	NOUN < PTCP < VER	(MacLeod 1987: 42)
MOP	*-al*	NOUN < VER.TR.R	(MacLeod 1987: 42)
MOP	*-ol*	NOUN < VER.TR.R	(MacLeod 1987: 42)
MOP	*-mah*	NOUN < VER.TR.R	(MacLeod 1987: 42)
MOP	*-ah*	NOUN < VER.TR.D	(MacLeod 1987: 42)
MOP	*-al*	NOUN < VER.TR.D	(MacLeod 1987: 42)
MOP	*-el*	GER < VER	(Bricker 1986: tab. 19)
LAK	*-ur*	NOUN < VER.TR.R	(MacLeod 1987: fig. 32)
LAK	*-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 27, 32)
LAK	*-el, -en*	NMLS	(Bruce 1968: 67)[459]

[458] For example VER.TR *¢'ah*, "give, place, put" > *¢'àah*, "gift" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 47).

[459] We can infer the nominalising use from the following example: *ʔooh–* is given as the root, with the participle (Bruce 1968: 74) *ʔoo-mən*, "lo sabido, conocido". Although *ʔoh-el* is attested and translated as a verb with "saber, conocer", we can in analogy to *ʔo-n-en*, "apellido" translate as "knowledge, wisdom" as well. Furthermore, YUK has *ah ohel* as "sabio y ladino" (Barrera Vásquez 1993: 594). This may relate to the epigraphically known 'Banded Bird' title. Nikolai Grube (personal communication, January 2004) proposed **EBET** (cf. Gronemeyer [2006b: 84] for a summary of the arguments), although the examples **ye-BANDED.BIRD-tV** from K5453 and a CRC stucco fragment rather appear to be a conflation with the head variant of **o** BT1(2) (Barbara MacLeod, written communication, October 17, 2011). This finds further support on the so-called *K'an Tok* Panel from

LAK	*-el*	GER < VER	(Bricker 1986: tab. 19)
YUK	*-Vl*	GER < VER	(McQuown 1967: 239)
YUK	-V*l*	NMLS < PASS	(McQuown 1967: 240)
YUK	*-ál, -íl, -úl*	deverbative stem (non-prod.)	(McQuown 1967: 240)
YUK	*-ul*	NMLS < VER.TR,POS	(Smailus 1989: 116-117)
YUK	*-el*	GER < VER	(Bricker 1986: tab. 19)
YUK	*-al*	GER,PTCP < VER [+INC]	(Kaufman 1994, A 3b: 29)
YUK	*-il*	NOUN < PTCP < VER	(MacLeod 1987: fig. 32)
YUK	*-ul*	NOUN < VER.INTR	(MacLeod 1987: fig. 32)
YUK	*-ul*	NOUN < VER.TR.R	(MacLeod 1987: fig. 32)
YUK	*-ah*	NOUN < VER.TR.D	(MacLeod 1987: fig. 27, 32)

Table 57: Yukatekan forms for the verbal nominaliser suffix.

Despite the possibility to derive verbal nouns from intransitive, transitive and affective roots (Kaufman 1972: 142), Tzeltalan languages (Table 58) also seem to use the prior intransitivation to derive nouns, as evidence from pTz[460], TZE and TZO[461] suggests. In most instances, however, the nominalisation is directly made to the verbal stem without intermediate derivation (cf. García de León 1971: 29-30). Instead, a "hidden passivation" is assumed for Colonial TZO (Haviland 1988: 86, 90, 102, 115) with transitive verbs[462].

Two allomorphs can be distinguished in modern TZE and TZO, *–el* ~ *–ol* (while pTz *–*ʌl* and * *–al* ceased to exist). The default vowel of the nominaliser appears to be [e] by the linguistic evidence. In terms of the alternate vocalisations, no specific functional differentiation can be observed. A special

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Palenque, where find the regular **o** sign BT1(1) in combination with the headband in a compound **BANDED.O-wa-li** (PAL K'TOK, pB3, pB9, pD9, pG7). MacLeod (written communication, October 18, 2011) subsequently proposed an original pYu morphographic reading **OJ**, "to know". Also cf. CHL *ujil* (Aulie and de Aulie 1978: 104) and CHN *ʔuwi* (Knowles 1984: 101) ~ *wi* (Pérez González and de la Cruz 1998: 78), suggesting **OW(I)**. The sign may otherwise have received **EBET** later on (as explainable by the common phonemic indicator **ta**). We may transliterate the Palenque case either as *o(j)wal* ~ *o(j)wil*, and with a suffix closely resembling the TZE agentive suffix *–wil* (Slocum 1948: 79) as a nominaliser, so *o(j)wil* may be a "sage". The same *–wil* suffix may also help to explain the name of God K, *K'awil*, as Slocum also provides the example *k'ahwil*, "harvester < *–k'ah*, "harvest corn". This tentative etymology might relate to God K's aspect as a deity of fertility and agriculture (Rice 2012, Taube 1985: 180, 1992: 48, 78), but also explain his patronage of divine kingship: it is the ruler's role to ensure the yields in an agricultural society. Also compare to YUK *k'awilyah* "significa pedir limosna, y se han encontrado otros contextos en que *k'awil* parece significar alimento" (Barrera Vásquez 1993: 387). The suffix is likely to be analysed as a *–w-Vl* nominalisation of an antipassive (see footnote 340). This assumption is strengthened by Kaufman's (1971: 69) description that *–wil* is used among antipassives in *–(V)wej* (Table 43) by replacing the suffix. Also see footnote 735 for another possible allomorph of the suffix.

[460] Compare derived VER.TR **-¢aʔ.tay*, "defecar" (from **¢ʌʔ*, "mierda") with derived VER.INTR **¢aʔ.an*, "defecar" and the derived noun **¢aʔ.n.el*, "diarrea, asientos", which apparently has an underlying antipassive form (Kaufman 1972: 97).

[461] Another example of a derived intransitive that ultimately does not originally come from a transitive root is *č'ahubel*, "laziness" < *č'ahub*, "become lazy or unproductive" < *č'ah*, "lazy, unproductive" (Laughlin 1975: 129).

[462] Several caveats can be made for this assumption. TZE and TZO know a <*j*> passive / mediopassive derivation (see Tables 8 and 48), and surely we may assume that the passive infix was not recorded among Colonial TZE or TZO sources. However, a scan of modern TZE and TZO dictionaries (assuming a recording of the infix was conducted) did not retrieve any lexicalised ***CVhCel* form that indicates such a passivation. In case of a transitive root, the nominalisation is directly made to the root. Haviland (1988: 102) considers for his "passive" nominalised transitives that "[…] their grammatical possessors are logically like transitive *direct objects*." This (independently?) relates to an older view by Seler (1902-23, I: 89): "[…] es treten zur Wiedergabe unserer transitiven objektbegleitenden Verbalausdrücke, Nominalthemata passiver Bedeutung ein […]." This may semantically be true, but morphosyntactically it is a misleading transposition. Therefore, the passivation may be too 'hidden' to be indeed be a grammatical process.

case is the Colonial TZE *–oj-el*, which appears to be cognate with certain Ch'olan forms (see footnote 441) as an intermediate intransitiviser.

Idiom	**Attestations**		**Sources**
pTz	**-el ~ -al*	NOUN < VER	(Kaufman 1972: 142)
pTz	**-ʌl*	NOUN < VER.INTR	(Kaufman 1972: 94, 118)[463]
pTz	**-el*	NOUN < VER.INTR,VER.TR	(Kaufman 1972: 142)
PTz	**-ay* (?)	NOUN < VER.TR ?	(Kaufman 1972: 94)[464]
TZE	*-el*	NOUN < VER (act/process)	(Slocum 1948: 78)
TZE	*-el*	NOUN < VER [-ANTIP,-PAS]	(Kaufman 1971: 71)
TZE	*-el*	NOUN < VER	(Robles Uribe 1962: 61)
TZE	*-el*	NOUN < VER	(Radhakrishnan 1970: 398)
TZE	*-el*	NOUN < VER	(Kaufman 1994, A 3b: 29)
TZE	*-el*	NOUN < VER	(Hinmán Smith n.d.: 42)
TZE	*-ol*	NOUN < VER.TR	(Slocum 1948: 79)[465]
TZE	*-ol*	NOUN < VER.TR	(Kaufman 1971: 75)
TZE	*-ol*	NOUN < VER	(Radhakrishnan 1970: 399)
TZE	*-ohel*	NOUN < VER.TR	(Slocum 1948: 79)[466]
TZE	*-ohel*	NOUN < VER.TR	(Kaufman 1971: 72)
TZE	*-oh-el*	NOUN < VER.TR	(Radhakrishnan 1970: 400)
TZE	*-emal*	NOUN < VER.TR	(Slocum 1948: 79)[467]
TZE	*<h>…-il*	NOUN < VER (for instrument)	(Slocum 1948: 78)[468]
TZO	*-el*	GER < VER	(Humberto Ruz 1989: 111)
TZO	*-el*	NOUN < VER	(Humberto Ruz 1989: 130-131)
TZO	*-el*	NOUN < PASS	(Haviland 1988: 86, 115)
TZO	*-el*	NOUN < VER.INTR (motion)	(Haviland 1981: 120)
TZO	*-el*	NOUN < VER.INTR.R	(Haviland 1981: 121, 233)
TZO	*-el*	NOUN < VER	(de Delgaty and Ruíz Sánchez 1978: 386-388)
TZO	*-el*	NOUN < VER	(Kaufman 1994, A 3b: 29)
TZO	*-el*	NOUN < VER [+$_{\text{PREP}}$]	(Haviland 1981: 265-266)
TZO	*-el*	NMLS < VER	(Laughlin 1975: 25)
TZO	*-el*	NMLS < VER (act of)	(Cowan 1969: 105)
TZO	*-ol*	NOUN,GER < VER	(Kaufman 1994, A 3b: 28)
TZO	*-ol*	NMLS	(García de León 1971: 29)
TZO	*-ol /CVC-in-_*	NMLS < VER.INTR (act of)	(Cowan 1969: 107)
TZO	*-b-ol*	NMLS	(García de León 1971: 30)
TZO	*-b-el*	NOUN < VER [+BEN]	(Haviland 1981: 266)

Table 58: Tzeltalan forms for the verbal nominaliser suffix.

463 The identification of this allomorph derives from the following examples: **ʔatim.ʌl*, "baño" < **ʔatin*, "bañarse" and **tax.im.ʌl*, "juego" < **taxin*, "jugar", among others.

464 The existence of this morpheme is doubtful and its function has not been specified by Kaufman. The following entries of the pTz dictionary however propose a special suffix reserved for transitive verbal roots (possibly cognate to Ch'olan and Yukatekan *–(y)ah*): **-ʔaht(ay)*, "cuenta (de números)" < **-ʔaht*, "contar (números)". However, Kaufman (1972: 39) provides *ʔahtay* as the TZE form and *ʔaht* as the TZO cognate for "contar", while there is also **–tay* to derive transitives from various roots (Kaufman 1972: 142).

465 See footnote 435 for parallels in CHL that *–ol* is attached to root transitives without prior intransitivations, e.g. *tohol*, "price" < *–toh*, " pay".

466 In contrast to the Ch'olan examples (see Table 56), the TZE cases rather form agentive nouns, e.g. *k'anohel*, "beggar" < *–k'an*, "ask for".

467 This derivation is not entirely understood, but it occurs with transitive roots, e.g. *pulemal*, "flood" < *–pul*, "pour". Thus, like with *–oh-el* (cognate to the Ch'olan antipassive, but fossilised in TZE?, see footnote 441), *–em* may be related to the *–m ~ –im* intransitiviser before *–al* derives the noun. Kaufman (1971: 73) classifies the suffix as non-productive. Some overlapping to the *–Vl* abstraction suffix seems to be involved as well (cf. Houston, Robertson and Stuart 2001b: 7-8).

468 This suffix is restricted to transitive verbs that got intransitivised by the *<h>* infix. It is also used to nominalise adjectives, e.g. *bihil*, "intelligence" < *bih*, "intelligent" (Slocum 1948: 78). It therefore seems to have a bridging role as an allomorph to *–el*, but also to the *–Vl* abstraction suffix (cf. Houston, Robertson and Stuart 2001b: 7-8).

The Greater Q'anjobalan languages exhibit a diversified range of nominalisation suffixes (Table 59), depending on the derivational basis and to a lesser degree the function of the noun. Simple suffixes of a *–V(l)* form as nominalisers of (predominantly) intransitives are known from CHJ, TOJ and MCH, a cognate *–(V)' ~ –l* from POP. The vowel is predominantly [e], but [a] and a root harmonic [u] are also existent. Intermediate forms of a *–C-Vl* pattern on transitive roots are known from TOJ (see footnote 469) and presumably also from CHJ, QAN and POP (see footnotes 467 and 474). Zero morphemes as nominalisers are present in QAN and because of cognate forms presumably also in CHJ, AKA and POP, although they have not been described for the latter.

In this sense, QAN suits as a showcase, as it requires an intransitive verb (or an intransitivised form) as the basis for nominalisations. It is achieved by the antipassive *–on* (Table 44) before the nominalisation takes place by *–Ø / … ~ –Ø-i / __#* (Mateo Pedro 2009: 46, 47, 61). Likewise, the absolute antipassive *–w* with the *–al* nominaliser is used, as well in other languages, while TOJ utilises a passivation. No study on functional or semantic differences has yet been conducted.

Generally, as data from several languages suggest (Mateo Pedro 2009: tab. 2), Greater Q'anjobalan languages can derive nouns from various roots, but prior intransitivation is either required or preferred. Based on QAN evidence, Mateo Pedro (2009, 2010: 53-64, tab. 2.8) argues for a "Nominalization Hypothesis" that requires prior intransitivations, as intransitive verbs and verbal nouns share the same suffix. Similar, though not exclusive patterns, are observable in Ch'olan and Yukatekan (compare the data in Tables 56 and 57 with those in Tables 46 and 47). More comparative studies are necessary, also in the light of split ergativity (see footnote 439), which QAN also features (cf. Larsen and Norman 1979).

Idiom	Attestations		Sources
CHJ	*-el*	NOUN < VER	(Williams and Williams 1966: 229, 230)
CHJ	*-el*	NOUN < VER.INTR	(Hopkins 1967a: 94)
CHJ	*-el*	NOUN < VER.INTR	(Buenrostro Díaz 2009: 43-45, 48, 75, 214)
CHJ	*-al*	NOUN < VER.TR,VER.INTR.D	(Hopkins 1967a: 94)
CHJ	*-ul*	NOUN < VER.TR.R	(Hopkins 1967a: 94)
CHJ	*-ul*	NOUN < VER.TR.R	(Buenrostro Díaz 2009: 92)
CHJ	*-mal*	NOUN < VER	(Williams and Williams 1966: 230)
CHJ	*-wal*	NOUN,INF < VER.TR	(Domingo Pascual 2007: 184)
CHJ	*-wal*	NOUN,INF < VER.TR	(García Pablo and Domingo Pascual 2007: 137)
CHJ	*-i*	NOUN < VER.INTR,VER.TR	(Mateo Pedro 2009: 57-58)
TOJ	*-el*	NOUN < VER.INTR	(Mateo Pedro 2009: 57)
TOJ	*-el*	NOUN < VER.TR,POS	(Furbee-Losee 1976: 84)
TOJ	*-h-el*	NOUN < VER.TR	(Brody 1990: 464)[469]
TOJ	*-j-el*	NOUN < PASS < VER.TR	(Mateo Pedro 2009: 57)
TOJ	*-ol*	NOUN < VER.TR	(Furbee-Losee 1976: 87)
TOJ	*-ul*	NOUN < VER.TR,NOUN	(Furbee-Losee 1976: 89)
TOJ	*-UL1*	NMLS (something ed)	(Furbee-Losee 1981, II: 80)
QAN	*-i*	NOUN < VER.INTR	(Mateo Pedro 2009: 51-52)
QAN	*-on-i*	NOUN < VER.TR	(Mateo Pedro 2009: 51-52)
QAN	*-oj* + NOUN	INF < VER.TR	(Q'anjob'al 2005: 224)
QAN	*-oj*	NOUN < VER.TR	(Francisco Pascual 2007: 31-32)

[469] The form contains an intermediate passivation (see Table 9), and the example provided is *s-mak'-h-el* '3SG.ERG-beat-PASS-NMLS' < *mak'*, "pegar".

QAN	*-oj ~ -wal*	NOUN < VER.TR	(de Diego Antonio et al. 2001: 24)[470]
QAN	*-wal*	NOUN < VER.TR	(Q'anjob'al 2005: 227)
QAN	*-wal*	NOUN < VER.TR	(Francisco Pascual 2007: 36)
AKA	*-o*	INF < VER	(Akateka 2007: 158, 201, 211)
AKA	*-o*	INF < VER	(Zavala Maldonado 1992b: 85-87, 276-278)
AKA	*-il*	INF < VER	(Zavala Maldonado 1992a: 185, 190)[471]
AKA	*-b'alil ~ -b'anil*	NOUN < VER.TR	(Méndez Martinez 2004: 136)[472]
POP	*-i*	NOUN < VER.INTR,VER.TR	(Mateo Pedro 2009: 58)
POP	*-b'ehal*	NOUN < VER.TR	(Ross Montejo and Delgado Rojas 2007: 24)[473]
POP	*-(e)b'ah-il*	NOUN (reciprocial)	(Delgado Rojas et al. 2007: 144)
POP	*-b'anil*	NOUN < VER.TR	(Popti' 2001: 168)
POP	-V_R*w*	NOUN < POS	(Ross Montejo and Delgado Rojas 2007: 25)[474]
POP	*-wal*	NOUN,INF < VER	(Ross Montejo and Delgado Rojas 2007: 67)[475]
POP	*-al*	INF < VER.TR	(Delgado Rojas et al. 2007: 141)
POP	*-uj /CuC ~ -oj*	INF < VER	(Delgado Rojas et al. 2007: 141-142)[476]
POP	*-uj /CuC ~ -oj*	NOUN,INF < VER	(Ross Montejo and Delgado Rojas 2007: 65)
POP	*-u' /CuC ~ -o'*	INF < VER /_$_{\text{PATIENT}}$	(Delgado Rojas et al. 2007: 142)
POP	*-u' /CuC ~ -o'*	NOUN,INF < VER /_NOUN	(Ross Montejo and Delgado Rojas 2007: 66)
POP	*-o' ~ -' ~ -l*	STAT < VER.TR,VER.INTR	(Day 1973: 46)
MCH	*-e:l*	NOUN < VER.TR,VER.INTR	(Palosaari 2011: tab. 5.1)
MCH	*-el*	NOUN < VER.INTR	(Palosaari 2011: tab. 5.2)
MCH	*-elaal*	NMLS	(Martin 1990: 431)
MCH	*-ela:l*	ABSTR < VER	(Palosaari 2011: tab. 5.1)

Table 59: Greater Q'anjobalan forms for the verbal nominaliser suffix.

[470] Both forms appear to be exchangeable. This derivation specifically produces a noun to indicate the act of doing, e.g. *xiqoj ~ xiqwal*, "acto de cortar", thus similar to a gerund. However, forms on *–oj* exclusively appear with a second noun to which the action is directed, e.g. *uk'oj ulul*, "beber atole", while *–wal* apparently is more productive with nouns related to the verb, e.g. *muqwal*, "entierro" (Q'anjob'al 2005: 224, 227).

[471] Since other Mayan languages may derive a gerund or infinitive by a *–Vl* suffix, this example is included, although it is not a semantic, but only a syntactic nominalisation. Compare to *č-ač-xex-le mulnal-il*, 'INC-2SG.ABS-forzar-PASS trabajar-INF' as "[t]ienes que trabajar." Zavala Maldonado considers the suffix as ABSTR.

[472] This form is problematic, as it can be segmented into *–b'al-il*, 'INSTR-POSS', as the following examples demonstrate: *txomb'al*, "mercado" and *xomb'alil* [sic!], "su Mercado" < *txon*, "[v]enta" (Méndez Martinez 2004: 136). All examples provided are possessed and have an instrumental or agentive meaning, e.g. *sma'b'alil*, "u [sic!] pegador" < *ma'*, "[p]egar".

[473] This suffix remains unexplained. By the examples given, a gerund or participial function can be assumed, e.g. *maq'b'ehal*, "para ser golpeado". Insufficient contextual discourse data are provided to judge on the morpheme's function. A tentative segmentation may be *–b-Vh-Vl* with the beneficative *–b* suffix.

[474] The description of this suffix seems to be problematical. With the *–wal* suffix of verbal nouns and infinitives (Ross Montejo and Delgado Rojas 2007: 67), we may have another explanation available, based on the indicative marker (Day 1973: 28-29), although it is said to be elided when other suffixes are to follow. The example sentence (Ross Montejo and Delgado Rojas 2007: 25) with *spohowal*, "the pus of" obviously bases on the transitive verb *poho*, "to break" (Day 1973: 133). Furthermore, the *–l* allomorph of the stataliser is said to be conditioned by the preceding occurrence of the antipassive *–wa* (Day 1973: 46) and outside a nominal compound. Following Ross Montejo and Delgado Rojas, the example should be analysed as *s-poh-ow-al* '3SG.ERG-break-NMLS-POSS' (with a positional basis), after Delgado Rojas et al. as *s-poh-o-w-al* '3SG.ERG-break-?-ANTIP-NMLS' and following Day as *s-poh-o-wa-l* '3SG.ERG-break-?-ANTIP-NMLS' (with a transitive basis). The role of the intermediate *–o* remains problematic, it is unlikely to represent the root transitive marker (Table 39) and may be an epenthesis.

[475] As per footnote 474, *–wal* should not be considered as a morpheme on its own, but as a combination of an antipassive suffix plus a nominaliser, with either *–w-al* or *–wa-l* as the possible segmentations. Hence the assignment of *–l ~ –al* as an infinitive does not describe this kind of derivation sufficiently, by context it can also be used as a noun whose semantics bases on the verb, e.g. *echmawal*, "espera" < *echma*, "esperar" (Ross Montejo and Delgado Rojas 2007: 67).

[476] The forms *–al* and *–oj ~ –uj* are functionally equivalent, and *–o' ~ –u'* represent morphosyntactically induced alterations to the latter (hence these can also follow an antipassive). Day (1973: 46) further states that *–o'* is reserved to CV and CVC root transitives.

Summarising the linguistic evidence, all Western Mayan branches and Yukatekan feature a variety of *–Vl* suffixes to nominalise (intransitive) verbs. We can distinguish two processes: (1) the verbal noun of infinitive / gerund meaning and (2) an abstractive nominalisation that derives an object, feature or process from the verbal action. As best supported by the Ch'olan evidence, we can assume two functionally distinct allomorphs in ClM that serve as the derivational suffix (Table 60): it is for (1) *–ol* ~ *–al* / CaC predominantly with transitive verbs and for (2) *–el* with intransitivised and root intransitive verbs. The latter case also has implications for the view that the incompletive of intransitive verbs is considered as a nominal form (see footnote 440). As mentioned above, the functional distinction is not as clearly indicated on a phonological basis as summarised here, exceptions may occur.

While all modern Ch'olan examples (and likewise other branches) feature a simple vowel (unless morphophonemically altered as in CHR), we have to debate this evidence against the orthographically induced reconstruction *–V'l* for ClM, as proposed by Lacadena and Wichmann (2005b: 28, tab. 3). Kaufman (1994, A 3b: 26, 28-29) reconstructs a pM incompletive participle / gerund **–o-al* for transitive and **–(e-)al* for intransitive verbs. Firstly, we have to clarify on the terminology. While a participle is an adjectival derivation, the gerund is a verbal noun, and in English these are homonymous forms (cf. Mincă 2010) only contextually to be differentiated[477]. The functional and phonological dichotomy we encounter in Ch'olan (and other GLL languages) can therefore be considered a reflex of these pM forms. Following Kaufman's (1994, A 2b: 73) considerations on vowel complexity, the reconstructed pM forms explain the existence of cognate *–VVl* forms in several Mayan languages, particularly in the EM branch. Since neither Ch'olan nor Tzeltalan feature long vowels (see footnote 109), we can assume that a potential pWM **–VVl* or **–V'l* < pM **–V-al* form was already lost in a pre-pGT stage and was not represented in ClM[478]. The assumption that the suffix in question was subject to quantity loss (see footnote 109) can also be dismissed.

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[477] Kaufman (1994, A 3b: 38) also remarks that "[t]he nominalization in *–al has a variety of functions in the descendant languages." We may therefore doubt that his reconstruction of pM VER.TR.R **–o-al* and VER.TR.D **–al* as the incompletive participle / gerund is thus justified when not all functions of the *–al* suffix are separately examined in modern languages. By not doing so, we may face the danger of a phonological and semantic amalgamation in the reconstruction.

[478] Also compare to the examples Lacadena and Wichmann (2005b: 28) provide in favour of disharmonic orthography, particularly in consideration of the blur between a participle and the gerund induced by the English grammar. Based on one minimal pair of examples, the authors distinguish between (1) a participial *–ool* and (2) a nominalising *–o'l* suffix of CVC transitive roots. The example for (2) is **u=ba ti CHOK[ko]=la** (CRN Msc. 3, A4), correctly interpreted as a verbal noun (i.e. a gerund), which I analyse as *u-ba[h]-Ø ti chok-ol*, "it (is) his image of scattering". The supposed contrasting case (with **li** versus **la**) for (1) is **jo-ch'o=li K'AK' ITZAM?-SABIN?[na]** (EKB Col. 1, E2-F1), part of the Initial Series fire drilling expression with the God N Weasel variant (for a reading of the animal head cf. Lopes [2005a: 6]) as the subject (cf. Grube 2000b: 99-100, figs. 5, 16). Since we have a specific description of a POP infinitive (often confused with a gerund in the grammars) *–o'* preceding the patient, I am tempted to analyse this example as a gerund *joch'-ol-Ø k'a[h]k' itzam? sa[h]bin?* as well, resulting in "God N Weasel (is) drilling fire" rather than a participle "fire is drilled", as Lacadena and Wichmann did. Their analysis and translation omits the agent and would rather evoke a passive participle, which is *–bil* in Ch'olan languages (see Table 6), also requiring a preposition to reintroduce the agent. In POP, such forms are also used to form nominal compounds, e.g. *ilo' ánma*, "people-watching" (Day 1973: 46), hence we can also translate as "God N Weasel (is) fire-drilling". Interestingly, all verbal examples in the Initial Series fire sequence brought forward by Grube (2000b: 94-96) are transitive and often carry a harmonic *–Vl* suffix, interpreted by him as a stative participle, e.g. **ta-pa=la u=K'AK ?-?** < *tap-al-Ø u-k'a[h]k' ?*, "extinguished is the fire of ?" (IXK St. 2, A7-B7). However, we also encounter passive forms, such as **jo-ch'o=ji=ya u=K'AK' ITZAM?-SABIN?[na]** < *jo<h>ch'-j-Ø=iy u-*

Lacadena and Wichmann (2005b: 28, tab. 3) chiefly reconstruct the nominalising suffixes as *–e'l* and *–o'l* because of disharmonic spellings, as the preponderant combination is **Ce=la** and **Co=la / __#**. While verbal root derivations are not supposed to feature any complex vowel, morphophonemic processes, as known from CHR, deserve a closer look. Since derivational morphemes and thematic suffixes in ClM still end on a consonant (with slight reservations regarding the passive thematic, see Chapter 3.1.1.1), it is still unlikely that a final base consonant was elided and triggered the nominaliser vowel to become glottalised[479]. Judging by the linguistic evidence, it is to question whether the suffix vowel was indeed glottalised, I tend to consider this to be an over-reconstruction.

Instead, the predominant use of **Ce=la** and **Co=la / __#** spellings rather appears to be motivated by visual reasons. Because the nominaliser vowel is variable (when subsuming the two nominalisation processes), =**la** serves as a graphemic marker, as it was already proposed for a variety of suffixes, such as the passive (Chapter 3.1.1.1) or the root transitive marker (Chapter 3.1.3.1). Although with caution, we may also argue from historical linguistics for the use of =**la**, in a similar way as with respect to **wa** as the root transitive marker. With pM **–o-al* > *–ol* in CHL, TZO and some EM languages (and *–al* in WAS) and pM **–(e-)al* > *–el* in most Mayan languages (~ YUK *–al*), some pM reflexes are retained, as Greater Q'anjobalan *–e(h)-al* and*–elal* forms. If the contraction was a pre-pCh process, =**la** might have been the synharmonic choice to mark nominalisations, although evidence is pending.

Yukatekan features a greater variety of nominaliser allomorphs, but in general, **CV=la / __#** patterns should also be expected in vernacular contexts, although their immediate function is not as unequivocal as in Ch'olan. Tzeltalan predominantly sticks to the Ch'olan scheme. Although comparable to the case of the instrumental (Chapter 3.1.5), prior intransitivation is not restricted to the Ch'olan branch alone, but a GTz phenomenon, although much weaker in Tzeltalan. This concerns at least as the abstractive nominalisation, as we have a suffix to directly derive from a transitive root. The identification of potential vernaculars therefore needs to be exercised with caution and under the caveat of a regional attribution only.

k'a[h]k' itzam sa[h]bin, "after the fire of God N Weasel was drilled" (YAX Lnt. 29, D4-D5) and also nominal compounds, as **TIL-K'AK' LEM?-AJAN** < *til-Ø+k'a[h]k'-Ø lem? ajan*, "fire-drilling Maize God" (MTL St. 1, B5-A6).

[479] Consider the case of **u=ti-mi=je=la** < *u-tim-(i)j-el* (PAL TI-W, A11-A12, see footnote 436). With a *–Vj* antipassive, no V-V environment is given, and even with the analysis of a passive (which is not favoured in contrast to other authors, e.g. Lacadena [2003: 850]), a syncopated thematic *–j* is indicated by the **je** sign. Furthermore, as the linguistic data from CHT show, we still have *–V-el* ~ *–Vh-el*. In case the /h/ is not just omitted in Morán's manuscript, we nevertheless would have no process *–V-el* > *–e'l*, but rather have *–V'-el*, as /Ve/ would not be a diphthong (or in this case a hiatus, rather) in Mayan phonology. Also refer to CHT morphophonemic processes with regard to the passive in footnote 163.

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-el / √<h>-el*	**CV$_1$-Ce=la / CV$_1$C-Ce=la**	1.a,b,c,d.i
		CV$_1$-(C)V$_1$=e-la / CV$_1$C=e-la	1.e.1
	√-[e]l	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
	√-ol	**CV$_1$-Co=la / CV$_1$C(-Co)=la**	1.a,b,c,d.i (2.e.i)
		CV$_1$-(C)V$_1$=o-la / CV$_1$C=o-la	1.e.1
	√-[o]l	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
	√-V$_2$j-el	**CV$_1$-CV$_2$=je=la / CV$_1$C(-CV$_2$)=je=la**	1.f.ii
		CV$_1$-CV$_1$=je=la / CV$_1$C(-CV$_1$)=je=la	1.f.ii
Eastern Ch'olan	(*) *√-V$_S$j-el*	**CV$_1$-CV$_2$=je=la / CV$_1$C(-CV$_2$)=je=la**	1.f.ii
	V$_S$={a,o}	**CV$_1$-CV$_1$=je=la / CV$_1$C(-CV$_1$)=je=la**	1.f.ii
Western Ch'olan	* *√-on-el*	**CV$_1$-Co=ne=la / CV$_1$C(-Co)=ne=la**	1.f.ii
	* *√-[o]n-el*	**CV$_1$-CV$_1$=ne=la / CV$_1$C(-CV$_1$)=ne=la**	1.f.ii
Yukatekan	(*) *√-el*	**CV$_1$-Ce=la / CV$_1$C-Ce=la**	1.a,b,c,d.i
		CV$_1$-(C)V$_1$=e-la / CV$_1$C=e-la	1.e.1
	(*) *√-[e]l*	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
	(*) *√-V$_2$l*	**CV$_1$-CV$_2$=la / CV$_1$C(-CV$_2$)=la**	1.a,b,c,d.i (2.e.i)
		CV$_1$-(C)V$_1$=V$_S$-la / CV$_1$C=V$_S$-la	1.e.1
	(*) *√-[V$_2$]l*	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
Tzeltalan	(*) *√-el*	**CV$_1$-Ce=la / CV$_1$C-Ce=la**	1.a,b,c,d.i
		CV$_1$-(C)V$_1$=e-la / CV$_1$C=e-la	1.e.1
	(*) *√-[e]l*	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
	(*) *√-ol*	**CV$_1$-Co=la / CV$_1$C(-Co)=la**	1.a,b,c,d.i (2.e.i)
		CV$_1$-(C)V$_1$=o-la / CV$_1$C=o-la	1.e.1
	(*) *√-[o]l*	**CV$_1$-CV$_1$=la / CV$_1$C(-CV$_1$)=la**	2.a,b,c,d.i (2.e.i)
	(*) *√-oj-el*	**CV$_1$-Co=je=la / CV$_1$C(-Co)=je=la**	1.f.ii
	(*) *√-[o]j-el*	**CV$_1$-CV$_1$=je=la / CV$_1$C(-CV$_1$)=je=la**	1.f.ii

Table 60: Representative, linguistically induced spelling patterns on junctures to be expected for the verbal nominaliser suffix among Ch'olan, Yukatekan and Tzeltalan.

3.1.7 – Test Group 4: Temporal Suffix *–V$_1$j ~ –Vj ~ –j*

Among the Ch'olan languages, what I term the 'temporal' suffix represents a certain conundrum in comparison with modern linguistic data. As outlined in Chapter 2.1.5, there are seemingly two homophonous suffixes of different function in ClM. The temporal deictic enclitic ~ *–ij* is to indicate a time relative to the narrative time, as Wald and MacLeod (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999) have extensively discussed. Most importantly, these enclitics are productive not only with verbs, but also nouns[480].

Verbs in Ch'olan languages are inflected with status markers to indicate the incompletive or completive (see Chapters 3.1.3.1 and 3.1.4.1), and occasionally by aspect prefixes (see footnote 290 for a ClM example). Aspect is non-deictic, therefore we need enclitics to add temporal deixis to the verb[481]. As the pM / pGT status system has not survived in pCh (Kaufman and Norman 1984: 93-94), we can-

[480] Most obvious with the denominators of Long Count periods in Distance Numbers (Wald 2004b: 235), e.g. **12-8-WINIK=ji 1-HAB** < *lajcha' [k'in=ij] waxak winik=[i]j jun h[a']ab=[ij]* (PAL TS, G14-H14).

[481] The differentiation between tense and aspect bases on Jakobson (1990: 390-391) who in 1957 defined that aspect "quantifies the narrated event" while tense "characterizes the narrated event with reference to the speech event." As an alternative to this view, with which the thesis also operates, Robertson, Houston and Stuart (2004: 264-267) argue that ClM shifted from an aspect to a tempus system and the enclitics shifted to inflectional morphemes.

not assume a perfect status to be reflected. MacLeod (2004: 294) applies plain versus perfect status where I refer to perfect aspect, as it describes a completed action with continuing relevance[482]. That perfect is an aspect in ClM is further strengthened by cases, where the form takes the temporal deictic enclitic *=iy* to mark an anterior event (cf. MacLeod [2004: 301-305] for examples). Like pCh VER.INTR **–el* [+INC] developed from the pGT **–eel* incompletive participle / gerund, the ClM 'temporal' suffix is ought be a reflex of a pGT **–ooj* < pM **–o-ej* perfect active participle of root transitives ~ **–ej* of derived transitives (Kaufman 1994, A 3a: 7, 15, 38)[483].

While the pM intransitive perfect participle **–e-7m* still finds reflexes in CHT, CHR and CHL (as well as TZO, TZE, CHJ and some EM languages), reflexes of the pGT **–ooj* are only found in TZO and TZE. The forms in TOJ, MAM, KCH and PCH are likely reflexes of the pM form[484]. Therefore, no back reconstruction was done for pCh, as in Ch'olan only the perfect passive participle **–bil* finds reflexes. By epigraphic evidence and historical linguistics, MacLeod (2004: 316) reconstructs a form ** –VVj* that can pertain to a pCh stage. The phonology for ClM will be discussed below.

In modern Ch'olan languages, the individual languages found different ways to express aspect and tense. Closest to the ClM case are the ECh languages. CHR verbs for example are not inflected with affixes for aspect (Wichmann 1999: 47). It is indicated by the choice of person markers (i.e. split ergativity, especially with intransitives and the preposed 'Set C' [+INC] pronouns), otherwise auxiliary verbs and adverbs are used to further specify deixis. The only exception is the 'recent completive' to indicate actions that just terminated (Ch'orti' 2004: 70). Such verbs are inflected as the regular completive, but feature the enclitic *=ix* to follow the absolutive pronoun. In WCh, CHN inflects for aspect (also see Chapters 3.1.3.1 and 3.1.4.1) and uses preposed adverbs for time (Keller and Luciano 1997: 450-451)[485]. CHL uses the perfect passive participle *–bil* or *–ʌl* (Warkentin and Scott 1980: 41) for in-

[482] Admittedly, this is a terminology tailored to Mayan languages. In general, typologists distinguish between perfective / completive and imperfective / incompletive aspect, the latter often with more subdivisions (e.g. Comrie 1995: 25). While the imperfective / perfective opposition is more styled after Indo-Germanic languages, I prefer incompletive / completive plus perfect to express a completed state with the described conditions.

[483] This represents a pGT innovation, as in the pM status system, we have the perfect **–o-7m* for root and ** –7m* for derived transitives (Kaufman 1994, A 3a: 7, Kaufman and Norman 1984: tab. 9). Reflexes of these forms are still found in EM, along with pM **–i-naq* of intransitives (cf. Kaufman [1994, A 3a: 7, 11] for cognate forms). It is not to be confused with the perfect participle of intransitives, pM **–e-7m* which turned into the ClM *–om* future participle (cf. MacLeod 2004: 294). However, in their reconstruction of the pGT status system, Kaufman and Norman (1984: 93) specifically omit the pM **–o-ej* in their forward reconstruction and admit only **–bil* as a perfect participle of transitives to occur in pGT to take the function of the lost perfect status. This assumption is possibly because only *–bil* survives as the passive participle in all Ch'olan and Tzeltalan languages, while reflexes of **–ooj* are only present in Tzeltalan and were unknown before their identification in ClM by MacLeod (2004).

[484] Interestingly, we also have a geographical continuum with this form, but much more restricted than the 'Huehuetenango sphere' (see Chapter 3.1.3.2 for the antipassive). From the WM branch, only Tz and TOJ are concerned, as well as only few EM languages. While CHJ uses an innovated form, the use of *–(u)nej* in TOJ as a perfect aspect marker may be the result of diffusion through Tzeltalan.

[485] However, the Acalan CHN morpheme *–ihi* that Wald (2000, 2004a) took as evidence for his view on the temporal deictic enclitic in ClM, is considered in a different way by MacLeod (2004: 307-308). In her view, it contains a reflex of the pGT **–ej* perfect (with [e] > [i]) which became fossilised, as also intransitive verbs take the suffix, followed by an anterior deictic enclitic *–i(y)*. The discussion of the **=ji(-ya)** / __# spellings demonstrate that the nature and the origin of the morpheme(s) written by this sign string is intimately tied together. As outlined in Chapter 2.1.5, only transitive verbs will therefore taken into account for the phonological implications of

transitives and positionals, as well as the perfect participle *–em* (Vázquez Alvarez 2002: 124-125) for all verbal classes.

Idiom	Attestations		Sources
pCh	**-VVj*	VER.TR [+PRF]	(MacLeod 2004: 316)
ECh	-		
CHT	-		
CHR	-		
CHN	-		
CHL	-		

Table 61: Ch'olan forms for the verbal temporal suffix.

For pYu, Kaufman reconstructs (cf. Mora-Marín 2001: tab. 2.21) **–m-aj* as the active perfect participle of root transitives. Reflexes are virtually found in all modern Yukatekan languages (Table 62), only for MOP, no information on a perfect form were found.

In YUK and ITZ, the best documented languages of the Yukatekan branch, perfect verbs miss a prefixed aspect marker, *–m* is the relevant inflectional morpheme and a reflex of the pM transitive perfect status **–o-7m* / **–7m* (Kaufman 1994, A 3a: 7), while *–aj* marks the completive / perfective aspect (see Table 37) of transitive verbs (Hofling [1991: 30] terms *–ah* the "distal patient marker")[486]. A phonological variant is known from LAK where [m] > [n] and [a] > [ə], with the schwa sound still part of the LAK six vowel system (Bruce 1968: 24-25, 26-27), although it is only reduced to an allophone.

Idiom	Attestations		Sources
ITZ	*-m-aj*	VER.TR [+PRF]	(Hofling 1998: 220)
ITZ	*-m-ah*	VER.TR [+PRF]	(Hofling 1991: 30)
MOP	n/a		
LAK	*-m-an ~ -m-ʌn*	VER.TR [+PRF]	(MacLeod 1987: fig. 25)
LAK	*-nəh*	VER.TR (finished state)	(Bruce 1968: 60, 62-63)
YUK	*-ma(x)*	VER.TR [+PFV]	(McQuown 1967: 231, 236)
YUK	*-m-ah*	VER.TR (distant past)	(Tozzer 1921: 79)
YUK	*-m-a(h)*	VER.TR [+PRF]	(MacLeod 1987: fig. 45)
YUK	*-ma*	VER.TR [+PRF]	(Swadesh, Álvarez and Bastarrechea 1970: 23)
YUK	*-m-ah*	VER.TR [+PRF]	(MacLeod 1987: fig. 25)
YUK	*-m-ah*	VER.TR [+PRF]	(Bricker, Po'ot Yah and Dzul de Po'ot 1998: 332)

Table 62: Yukatekan forms for the verbal temporal suffix.

In Tzeltalan (Table 63), we can distinguish two perfect suffixes according to Kaufman (1994, A 3b: 30): *–oj* for root transitives and *–ej* for derived transitives. Both are considered as innovations, because of the pM active perfect participle (see above), which shifted to pGT **–ooj* and **–ej* aspect mark-

=ji(-ya) / __#. Only these account because of historical linguistics, while intransitives rather account to the history of the pM perfect participle * *–e-7m*. The occurrence of **=ji(-ya)** / __# among intransitive verbs therefore needs to seek other explanations. Even if there was a common origin, the suffixes became functionally separated while retaining homophony (and eventually homography).

[486] Although not related to the case of the ClM perfect, one interesting note concerns the use of the ITZ *–ej* suffix as the dependent status marker of derived transitive verbs (Hofling and Tesucún 2000: 50), used with verbs in subordinate statements. The switch to a different status reminds of MacLeod's (2004: 294) idea of perfective, secondary verbs). Compare to the sentence *[i] a' tzimin-ej ma' uy-ojel u-jan-t-ej* 'and DET horse-TOP NEG 3SG.ERG-know 3SG.ERG-eat-VERB-DEP', "[a]nd the horse didn't know to eat it."

ers (cf. MacLeod 2004: 294-296). While reflexes of this innovation are kept in Tzeltalan (contrary to Ch'olan), the system further simplified in modern Tzeltalan languages, as modern TZO only retained *–oj* for any perfect transitive (in contrast to Colonial TZO), TZE is more conservative by retaining the pTz distinction.

According to MacLeod (2004: 319), *–ej* is still seen in Colonial TZE as a gerund form of derived transitives, while the perfect function is a synchronous innovation. I would rather not equate it without reservation with *–oj* and especially *–oj-el*, which is supposed to have lost its gerundive function. As explained in footnote 441, we seem to have two functional different *–oj* morphemes. When appearing alone, *–oj* is the perfect marker, while in connection with *–el* it is ~ *–Vj* and a reflex to a pGT intransitiviser.

Idiom	Attestations		Sources
pTz	**-ex ~ -ox*	VER.TR [+PRF]	(Kaufman 1972: 149)
TZE	*-oh*	VER.TR [+PRF]	(Kaufman 1971: 103)
TZE	*-oj*	VER.TR [+PRF]	(Robles Uribe 1962: 58)
TZE	*-oh, -eh*	VER.TR [+PRF]	(Radhakrishnan 1970: 415)
TZE	*-oj ~ -ej /y_*	VER.TR [+PRF]	(Hinmán Smith n.d.: 53)
TZE	*-oj / -ej*	VER.TR [+PRF] (innovated)	(Kaufman 1994, A 3a: 7)
TZO	*-oj / -ej*	STAT < VER.TR	(Haviland 1988: 85)[487]
TZO	*-oj / -ej*	VER.TR [+PRF] (innovated)	(Kaufman 1994, A 3a: 7)
TZO	*-ox*	VER.TR [+PRF]	(Cowan and Merrifield 1968: 288-289)
TZO	*-ox*	VER.TR [+PRF]	(Cowan 1969: 12)
TZO	*-oj*	VER.TR [+PRF]	(García de León 1971: 26)
TZO	*-oj*	STAT < VER.TR	(Haviland 1981: 227)
TZO	*-oh*	VER.TR [+PFV]	(Laughlin 1975: 26)
TZO	*-oj*	VER.TR [+PRF]	(Haviland 2007: 35)
TZO	*-o*	VER.TR [+PFV]	(Hopkins 1967b: 14)

Table 63: Tzeltalan forms for the verbal temporal suffix.

Among the Greater Q'anjobalan languages (Table 64), only TOJ features a reflex of the pM * *–o-ej*. CHJ innovated *–nak* as the perfect marker of transitives from its original function as the pM perfect status suffix **–i-naq* of intransitives (Kaufman 1994, A 3a: 11).

While data from MCH are missing, all other languages lack a suffix and mark the perfect by other means. The perfect as its own aspect is absent from QAN (cf. Q'anjob'al 2005: 79) which only has passive perfect participles (Q'anjob'al 2005: 247, 249). POP exclusively realises aspect in general by prefixes (Delgado Rojas et al. 2007: 111-116). The proposed aspect prefix *xax–* realises the perfect in AKA[488], otherwise only passive perfect participles are used (Méndez Martinez 2004: 109-110, 118, cf. Zavala Maldonado 1992b: 72-73).

[487] Although Haviland describes a stative function, the parallel description and translation of the examples in modern TZO (Haviland 1981: 227) provides clear evidence for a perfect form: "[l]a forma estativa de un verbo transitivo denota el estado que resulta de realizar una acción", e.g. *kilojot ʔonox*, "[y]a te he visto siempre ([e]s decir: te conozco la cara)." Also refer to MacLeod (2004: 324) for a discussion of such forms.

[488] In fact, the prefix segments (cf. Zavala Maldonado 1992b: 72-73) into the particle *š̥a*, "ya" and the completive status marker *š̥–*, together with the enclitic *=taʔ* in variable position of the verbal morphosyntax.

Idiom	Attestations		Sources
CHJ	*-nak*	VER.TR [+PRF] (innovated)	(Kaufman 1994, A 3a: 7)
CHJ	*-nak*	VER.TR [+PST]	(Domingo Pascual 2007: 175)
CHJ	*-nak*	VER.TR [+PST]	(Buenrostro Díaz 2009: 177)
TOJ	*-uneh ~ -neh*	VER.TR [+PRF]	(Supple and Douglass 1949: 173)
TOJ	*-unej*	VER.TR [+PFV]	(Lenkersdorf 2002: 187-188)
TOJ	*-uneh ~ -neh*	VER.TR [+PFV]	(Furbee-Losee 1976: 133-134)
TOJ	*-UNEH*	VER.TR [+PFV]	(Furbee-Losee 1981, II: 81)
TOJ	*-unej*	VER.TR.R [+PRF] (innovated)	(Kaufman 1994, A 3a: 7)
TOJ	*-nej*	VER.TR.D [+PRF] (innovated)	(Kaufman 1994, A 3a: 7)
QAN	-		
AKA	-		
POP	-		
MCH	n/a		

Table 64: Greater Q'anjobalan forms for the verbal temporal suffix.

In order to understand the phonology of the ClM *–Vj* temporal suffix, it is important to factor in several parameters: (1) the historical development of the suffix and its functional and phonological implications, (2) its morphological classification (3) the distinction between root and derived transitives and their thematic suffixes and (4) evidently the orthographic realisation. While the fourth aspect is yet to be analysed, we must restrict ourselves to the first three parameters as a hypothesis.

I largely concur with previous authors (see above) about the development of the 'temporal' *–Vj* suffix. With root transitives, we have pM **–o-ej* > pGT **–ooj* > pTz **–oj*. In pGT, **–ej* assimilated the preceding /o/ vowel[489], resulting in a morphophonemic vowel lengthening (see footnote 73), while later pTz lost long vowels. For derived transitives, we can assume a continuous use of **–ej*, and, as MacLeod (2004: 316) noted, Tzeltalan derived transitives end on a consonant, hence no vowel assimilation is needed.

The way of reconstruction through to Tzeltalan is straightforward, because of the phonological uniformity in this branch. The epigraphic evidence suggests a broader phonological range which can be explained by Ch'olan verbal morphology. MacLeod (2004: 294, 297, 316-317, figs. 11.3, 11.5), who concentrated on derived transitives, assumes an underlying form **CVC-(C)V-ej* for them, realised as *CVC-(C)-Vj* (with vowel assimilation, while I ignore her supposed lengthening)[490]. Ch'olan derived transitives end in certain thematic *–V* suffixes, namely the 'factive' *–a* and 'usative/applicative' *–i* (MacLeod 2004: 311). Likewise, non-CVC transitives end in *–V*. Other derived transitives feature *–CV* suffixes, which also enable assimilation[491]. However, the question of vowel assimilation or deletion cannot uniformly be answered for all suffixes (see footnote 83). But with a considerable amount of spelling group 1 examples for the *–Vj* suffix, the epigraphic evidence suggests assimilation. Other transitivisers feature a *–VC* pattern, e.g. the causative, among these, spellings yielding *–ej* are to be ex-

[489] Such processes are also strengthened by other historical assimilations detailed in the showcases, e.g. the pM incompletive participle / gerund **–o-al* : **–(e-)al* (Chapter 3.1.6).

[490] Alternatively, we may also assume **CVC-(C)V-ej* > *CVC-(C)V-j*, where the vowel of the perfect marker is elided and the derived transitive suffix vowel is simply retained.

[491] An example of the first case is **ya-ti=ji** < *y-at-ij-Ø* (TNA Mon 139, N1) from an underlying ***y-at-i-ej-Ø*, "he has bathed it". The second case can be exemplified by **u=TZ'AK=bu=ji** < *u-tz'ak-b-uj-Ø* (PAL TISL, 10) from ***u-tz'ak-bu-ej-Ø*, "he has changed it".

pected. If the assumption is viable, the orthographic realisation with a supposed vowel-providing spelling will also enable us to identify the vowel of any *–V* and *–CV* suffix for a specific derived transitive base.

There are few examples of perfect root transitive verbs, which represent a somewhat more extensive problem in terms of their phonology. MacLeod (2004: 298) proposes that the $-V_1$ status suffix (Chapter 3.1.3.1) of root transitives also gets assimilated with just an **–ej* suffix[492]. In fact, the epigraphic examples evidently support a $-V_1j$ perfect suffix among root transitives. While we have orthographic support, there are doubts to be expressed from a linguistic point of view. First of all, if the aspect suffix is retained to get assimilated, it should feature its $-V_1w$ / … allomorph (Chapter 3.1.3.1), where the glide /w/ prevents vowel assimilation with the following suffix, unless it is elided. Also, the $-V_1(w)$ suffix is the plain status marker (regardless of incompletive/completive aspect) and should entirely get replaced by the perfect suffix when the aspect changes (see below on the nature of the suffix), as they are mutually exclusive. Furthermore, it seems doubtful why the daughter language pCh would not inherit the pGT **–ooj*, as does its sibling pTz with **–oj*, thus arguing for a pCh **–oj* rather.

However, we have evidence for the root transitive marker (Chapter 3.1.3.1) to have changed from fixed vowel pGT **–a(w)* > root harmonic pCh $*-V_1(w)$ > ClM $-V_1(w)$. It is also true for the antipassive (Chapter 3.1.3.2), with pGT **–oon* and **–aw* > pCh **–Vn* and **–Vw* > ClM $-V_1n$ and $-V_1w$. While there seems to be a general (though not exclusive) phonological process pGT **–oo(C)* / ** –a(C)* > pCh $*-V_1(C)$ (in contrast to pTz), we can also assume that the root transitive perfect suffix was phonologically influenced by the sound shift of the status suffix[493]. I therefore rather consider a pCh perfect suffix of root transitives $*-V_1j$ > ClM $-V_1j$. It is therefore partly homonymous to *–Vj* of derived transitives, although without an underlying morphophonemic process. The root transitive suffix can also feature ~ *–ej* ~ *–oj* as root harmonic suffixes, while these vowels are absent from any transitiviser. A final note on the suffix phonology is concerned about the process of loosing the final spirant, a tendency observed in other cases as well (see Chapter 3.1.1.1). MacLeod (2004: 317) assumes [x] > [h] > [Ø] to have already occurred in the Late Classic[494].

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492 For example **ma u=na-wa=ji** < *ma['] u-naw-aj-Ø* (PAL TI-E, O10) for which MacLeod assumes the underlying ***u-naw-a-ej-Ø*.

493 There is an alternative approach, although less probable, as pGT generally shows $*-VV_1C$ < pM $*-V_1\text{-}V_2C$ assimilation, at least judged by the linguistic evidence presented in the hypotheses of Chapter 3. In this model, the root transitive suffix was still **–o-ej* in pGT and assimilated to pre-pCh **–oj* > pCh $*-V_1j$ and to pre-pTz **–oj* > pTz ** –oj*. This model would also lack sufficient explanation for the vowel shortening that occurred before the splitting of pGT into pCh and pTz.

494 For example with the contrast of **yi=la=ji** < *y-il-aj-Ø* (PNG P. 3, J1, 9.17.11.6.1) vs. **yi=IL=a** < *y-il-a-Ø* (IXZ St. 4, A7a, 9.17.10.0.0), although both examples are fairly contemporaneous. A possible intermediate spelling is **yi=ta=hi** < *y-it-ah-Ø* (CPN Alt. K, J2), which remains almost too early for the loss of the orthographic (also in this case?) distinction between /h/ and /j/. According to Grube (2004d: 79), the first trace is at 9.13.15.0.0 on NAR St. 21, A3, whereas CPN Alt. K dates to 9.12.16.10.8. When considering consonant muting, there are two major possibilities: (1) the spellings may reflect vernacular traits (e.g. a contrast between WCh and ECh, the latter undergoing debuccalisation), or (2) the 'loss' of the final spirant may simply represent an underspelling to be classified as a 1.g.i spelling scheme. The same question also pertains to the examples of **yi=ta HUL**[(li)] on CPN Alt. Q, D4-C5 and NAR St. 29, F12-G12. MacLeod (2004: 300-301) considers a nominal compound to express "fellow arriver(s)", analysable as *y-it(-a)-Ø-hul*. These two examples can still be understood as verbs. We do not necessarily need to consider even a perfect status and bother with the final spirant loss, but assume a plain indicative

Finally, we have to contrast the transitive perfect aspect *–V₁j ~ –Vj* in origin, phonology, and function with the temporal deictic enclitic *=ij*. Wald (2004b: 235) cites pCh and CHN evidence for comparison (also see footnote 70) in that ClM *=ij* is a 'neutral/future' enclitic, while *=ij=i(y)* marks the past. The origin is likewise debated, while some scholars (Wald 2000: fn. 7, tab. 1, 2004b: 235-237, fig. 9.14) see the origin in the pM enclitic **=eej(=eey)*, others (e.g. MacLeod 2004: 307-308) alternatively consider the pM active perfect participle **–ej*. In fact, we still may find a substratum of the perfect participle in ClM (MacLeod 2004: 316)[495]. Regardless of the origin, there are indications from the epigraphic evidence that the ClM enclitic was always *=ij(=iy)*[496]. As said above, the ClM perfect *–V₁j ~ –Vj* is a morpheme of transitive verbs to indicate temporal deixis among them (MacLeod 2004: 301-305), i.e. the persisting relevance of the action, possibly suffixed by *=iy* to indicate a distant past or refer to a known information. The enclitic apparently is used among all other lexical classes to fulfil the same role and to weave the temporal discourse structure.

The perfect is its own aspect in ClM, but it is related to the otherwise unmarked completive, as we do not find any aspect prefixes or time adverbs with them. The plain status *–V₁* suffix is replaced by a *–V₁j* suffix as the proper aspect marker[497], the derived transitive thematic / transitiviser vowel is assimilated to *–Vj*. In accordance with the enclitic *=ij*, we find an almost constant realisation by **CV=ji** / __# spellings. In both cases, **=ji** seems to act as a visual reading aid (Tokovinine and Davletshin 2001).

The identification of vernacular forms from both the Tzeltalan and Yukatekan branches is possible by their different vocalisation. At least Tzeltalan evidence with *–oj* / *–ej* accounts to this test group as a vernacular, while Yukatekan *–m-aj* does not, as *–m* is the proper perfect suffix.

Branch	Paradigm	Spellings	Schemes
Common Ch'olan	*√-V_1j*	**CV_1-CV_1=ji / CV_1C-CV_1=ji**	1.a,b,c,d.i
		CV_1C=V_1-ji	1.e.1
	√-[V_1]j	**CV_1-CV_2=ji / CV_1C(-CV_2)=ji**	2.a,b,c,d.i (2.e.i)
	√-C_d-V_dj	**CV_1-CV_1=CV_d=ji / CV_1C=CV_d=ji**	1.a,b,c,d.i
	√-[V_S]j	**CV_1-CV_2=ji / CV_1C(-CV_2)=ji**	2.a,b,c,d.i (2.e.i)

status for such spellings. An example such as on IXZ St. 4 might simply represent evidence for a *–V* / __# form of the root transitive marker (cf. CHR *ira* [Hull 2005: 45], as the non-CVC verb *il* takes the *–a* suffix [2007: 235-239]). The same is true for the derived verb *it-a*, as the ostensible omittance of a final **jV** sign is attested with **yi=ta** < *y-it-a-Ø* (COL St. Hauberg, D1) as early as 8.7.17.14.4 or **yi=IL=a** < *y-il-a-Ø* on CRC St. 3, C12a with 9.10.0.0.0 as its latest date.

495 MacLeod exemplifies by **ya-le=je GI GII GIII** < *yal-ej-Ø GI GII GIII* (PAL HCHS, C2a) as "GI, GII, GIII are in a thrown-down state". There are however doubts, as **–ej* is supposed to be the allomorph of derived transitives. If the verb is connected to the pCh VER.TR.R **yäl*, "throw down" (Kaufman and Norman 1984: 137), one would expect the root transitive ~ **–oj* rendered by a spelling ****ya-lo=ji**. In any case, spellings that do not provide a plain *–V₁j* suffix (as the result of assimilation) with simultaneous absence of an ergative pronoun and any transitiviser may indicate an active perfect participle and deserve special consideration in the analysis.

496 For example **HUL-le=li=ji=ya** < *hul-el-Ø=ij=iy* (CPN Alt. F', A3b), but also **HUL=i-ya** < *hul-Ø=iy* (NAR K1398, Y1). Also see the distance number **15-ni=ji=ya** < *ho'lajun=ij=iy* (YAX Lnt. 29, C1) and note that **ni** functions as a phonemic complement to the bar-and-dot notation of "fifteen", also providing the following vowel.

497 When following MacLeod (2004: 298) that the plains status suffix is assimilated and considering the CHR evidence of the 'recent completive', one could consider *–V₁j* as an enclitic as well. However, it is restricted to transitive verbs only, in contrast to *–ij*, which is an enclitic by applying the definition of Kaufman and Norman (1984: 94): enclitics are not a necessary part of the inflectional paradigm and can be applied to more than one lexical class.

Eastern Ch'olan	n/a		
Western Ch'olan	n/a		
Yukatekan	** √-m-aj*	**CV_1-CV_1=ma=ja / CV_1C(-CV_1)=ma=ja**	1.f.ii
Tzeltalan	** √-oj*	**CV_1-Co=ji / CV_1C-Co=ji**	1.a,b,c,d.i ,ii
	** √-[o]j*	**CV_1-CV_1=ji / CV_1C(-CV_1)=ji**	2.a,b,c,d.i (2.e.i)
	** √-ej*	**CV_1-Ce=ji / CV_1C-Ce=ji**	1.a,b,c,d.i ,ii
	** √-[e]j*	**CV_1-CV_1=ji / CV_1C(-CV_1)=ji**	2.a,b,c,d.i (2.e.i)

Table 65: Representative, linguistically induced spelling patterns on junctures to be expected for the verbal temporal suffix among Ch'olan, Yukatekan and Tzeltalan.

3.2 – Hypotheses Conclusions

In the spirit of a transparent approach to Classic Mayan orthography and phonemics, the results from Chapter 3.1 will be summarised in tentative conclusions. More important in this sense is the comparison of the findings among the linguistic evidence and the implications for spellings beyond the current state of research outlined in Chapter 2.1 that led to the definition of the analytical showcases. Likewise, the goal is to calibrate the insights from the hypotheses with the desiderata made in Chapter 1.4. While the majority of cases can be confirmed, several cases differ considerably as far as the phonological shape of the suffixes in question is concerned. This affects both the presence of the final consonant as well as the variety of the initial vowel (i.e. fixed, root harmonic, variable) or ultimately its absence. Several aspects of the hypotheses can be generalised to common observations, yielding broader implications for both linguistic reconstructions and epigraphic models within the analysis, e.g. regarding the semantic and functional implications of a specific suffix or allomorph.

For the most part, the linguistic data collected for the hypotheses and the formulation of the spelling patterns to be expected provide ample justification of why the showcases from Chapter 2.1 were selected to become a representative sample. Moreover, the comparison of the linguistic data facilitates the identification of possible vernacular features by differing vocalisations and may eventually prove a more diverse influence of spoken language in the script.

However, it is important to mention that the hypotheses are linguistically induced and therefore determine the orthographic paradigms. These, in turn, are based on the definition of the spelling schemes from Chapter 2.2.2, based on actual epigraphic material. Thus, the paradigms reflect the current state of research partially for hitherto unaccounted linguistic data. The analysis of the epigraphic data and its statistical evaluation can be processed unbiased from the postulated orthographic paradigms (see Chapter 3.4.1). But the dichotomy between linguistic and orthographic hypotheses is actually beneficial for the interpretation of the data: if we arrive at a good accordance between both, we likely already have a solid case that the hypothesis for a showcase is correct. In case of a clear mismatch, the analysis must be reiterated to alternatively explain deviations: (1) either the linguistic postulate is wrong; (2) the sample set is insufficient to empirically explain patterns; or (3) there is evidence for specific spelling practices that were beyond expectation. In any case, the statistical methods described in Chapter 2.5.2 serve as the methodological standard to support the hypothesis testing.

3.2.1 – Linguistic Hypothesis Conclusions

Several concerns regarding the linguistic postulates have to made. One is the reconstruction of forms on the basis of the 'binary comparison' following Hoenigswald (1960). As several authors (cf. Campbell 2004: 165-166, Wolfram and Schilling-Estes 2003: 721) point out, the comparative approach resulting in phylogenetic models assumes sudden language splits and no subsequent interference among the daughter languages or diffusion. To handle the 'real impact' of such factors in this ideal and inadequate model, further methods needs to be applied, such as sub-grouping and areal linguistics (cf. Campbell 2004: 207-210). The occurrence of 'innovations' in any daughter language can be twofold: as the result of an *exogenous impulse*, the interference with another language, or an *endogenous change* from within (which nevertheless can be triggered by contact [Backus 2005: 334]). These innovations appear on the spoken language level first, before potentially being reflected in the script.

As an apparently fairly standardised written language, the codification was under elite control and production. As the epigraphic record is the product of few, specific spoken forms and vernaculars tend towards to be individual decisions in writing. These may range from 'narrow vernaculars' to 'broad creolisations' (see footnote 121), potentially blurring the viability of a reconstruction of a proto-form. How does the variability of such forms eventually get actuated and perpetuated? This involves sociolinguistic considerations, especially when considering the expected diglossia situation in most areas of the Maya world between the written ClM and the spoken languages. In turn, it is also to question how hieroglyphic writing with inherited vernacular forms caused linguistic diffusion by the spread of written forms into areas of another spoken language. We therefore can constitute two vertical processes of transfer[498]. Such processes possibly affect the daughter languages in not necessarily preserving reflexes of the mother language, in a downstream transfer always as an exogenous impulse.

How do such considerations affect the linguistic hypotheses? Several key points can be addressed that are relevant to the thesis objectives:

[498] We can postulate a primacy of spoken language and its impact to written language, an assumption that is the basis for identifying vernacular traits in hieroglyphic writing (Lacadena 2000b, Lacadena and Wichmann 2002, 2005a). This can be termed an *upstream transfer*. Hruby and Child (2004) trace the eastwards spread of the positional suffix *–wan* during the Late Classic from the area of present-day spoken CHN. By the end of the Late Classic, it has reached the south-eastern areas of the Maya area, occupied by ECh speakers. The authors (Hruby and Child 2004: 14, 21) conclude that it eventually replaced an original ECh **–laj* in this area, hence we only find *–wan* in CHT and CHR (which may lead to an actually erroneous reconstruction **–wan* based on the evidence from the daughter languages [Storniolo 2008: 156]). The epigraphic evidence that shows a persisting use of *–laj* in the hieroglyphic texts is strong support that the transfer was not (only) by the spoken language, but mostly or entirely by the written texts in the first instance, before a *downstream transfer* took place into the ECh daughter languages. To explain such processes with substratal spoken vernaculars imposes some terminological and methodological problems: the converse argument requires to view the written language as a superstratum. The term 'substratum' was originally coined to describe the contact situation in Gaul (Ascoli 1882: 30) upon the Roman conquest: "Or le differenze che ne resultano, in parte hanno di certo la lor piena ragione dalla proporzione diversa in cui entrano i due fattori etnici, il romano e il gallico, nella composizione del nuovo ente nazionale; in parte dalle diversità che pur certamente occorrevano nella qualità o nella composizione del substrato anteromano di queste medesime terre che diciamo galliche." The 'superstratum' in Walter von Wartburg's sense is therefore "a prestigious language forcibly imposed" (Tristram 2007: 195) and results from colonisation, as paradigmatically also exercised by the Roman expansion (Mufwene 2004: 212-215). See below points (3) and (4) for further consideration.

(1) *Vowel complexity*: One point of severe debate has been the existence of complex vowels in ClM, as first proposed by Houston, Stuart and Robertson (1998). The authors in first instance deducted long vowels by disharmonic spellings and consider them as a reflex of earlier languages (see footnote 109). As stated before, neither one of the four Ch'olan nor the Tzeltalan languages retain long vowels as minimal pairs, suggesting that late pGT already lost them. However, several scholars (Marc Zender, personal communication, December 15, 2012) deem the loss of vowel length as a parallel development within both branches, arguing that daughter languages do not have to preserve reflexes. But in fact, none of the WM languages retains long vowels (except in MCH and some recent innovations in AKA [Law 2011: 98-100, tab. 3]), but ClM is supposed to be the only exception. The question remains when and how vowel length was lost and if the Greater Q'anjobalan branch developed shortening independently (as pGT is supposed to have retained long vowels). In hieroglyphic writing, shifts to synharmonic spellings are considered as the overt orthographic reflection (Houston, Stuart and Robertson 1998: 284-285, 291-292). Such hypothesis operates under several provisos.

(a) Regardless which disharmonic model is preferred (with Lacadena and Wichmann [2004] granting a more extent vernacular influence), the acceptance of the Classic Ch'olti'an hypothesis (Houston, Robertson and Stuart 2000) is a favourable prerequisite. If vowel shorting were a Late Classic ClM phenomenon, it would best explain the development from ClM > CHT > CHR.

(b) In the Classic Ch'olti'an model, CHN and CHL are direct daughters of 'Common Ch'olan' (Houston, Robertson and Stuart 2000: fig. 1), hence the model fails to explain a direct impact on these languages except a downstream transfer via the script or an exogenous impulse from outside the script is assumed.

(c) At the same time, the Tzeltalan branch needs consideration. When accepting Kaufman's (1972) reconstruction, pTz independently underwent vowel shortening. If it were still reflected in ClM, the common ancestor ('Common Wasteko-Ch'olan' in the Classic Ch'olti'an model) must have had long vowels still[499].

When features of a mother language are not automatically reflected in all daughter languages, the argument could also be taken for pGT: its daughters did not inherit vowel length, most likely because it was already lost in its latest stage. Instead of justifying a num-

[499] Following Houston, Robertson and Stuart (2000), the reflex of long vowels in pWa (cf. Norcliffe 2003: 16, 90, figs. 2, 5) would thus be the result of the branching from this family, at least with WAS retaining them due to the geographic separation in today's Veracruz, San Luís Potosí and Tamaulipas states. Data on the now extinct KAB spoken in Chiapas provide no decisive evidence on vowel length. However, in following other models (Figure 4), pWa branched off pM which also provides sufficient correspondence of vowel length (cf. Norcliffe 2003: 90, 115, 119).

ber of parallel processes, we only need one to explain the reflexes in the vowel system of pCh and pTz and its daughters[500].

In consistency with the argumentation that long vowels were already lost in late pGT, I take the persistent occurrence of short vowels in the relevant linguistic data as evidence for short vowel suffixes in ClM, unless the data indicate morphophonemic processes that render a complex vowel. Such data are rare, only the CHR nominaliser (Chapter 3.1.6) is firmly attested. Although based on scant data, I hypothesise that the following processes may occur at underlying V-V morphemic boundaries with the following rules in ClM: $–(C)V_1\text{-}V_1C >$ $–V_1\text{’}C$ and $–(C)V_1\text{-}V_2C > –(C)V_1\text{-}C$ / $–(C)V_1\text{’-}V_2C$. These assumptions may further be subject to the identification of a spelling in a vernacular context (considering the frequency of $–V_1\text{-}V_2C$ suffixation in CHT). Nevertheless, the analysis will still crosscheck disharmonic spellings in the suffix domain against the possibility of complex vowels, as suggested by Lacadena and Wichmann (2005b), see Chapter 4.2.3 for a final review.

Although not relevant for the present study, the denial of long vowels among grammatical morphemes also prompts their abrogation among lexemes. In fact, none of the entries reconstructed for pCh (Kaufman and Norman 1984) features a long vowel, nor does pTz (Kaufman 1972). We find some pCh words with a non-initial [h] (Kaufman and Norman 1984: 144), these are reflexes of earlier stages and are still preserved in various modern Ch’olan languages[501]. Likewise, an internal [ʔ] is attested the same way[502] and thus, such nuclei are also valid reconstructions for ClM.

(2) *Ch’olan traits*: The affiliation of ClM with the Ch’olan has undoubtedly been proven by numerous studies (see Chapter 1.2.2.3), and the majority of the linguistic data strongly confirm it by largely matching the state of research outlined in Chapter 2.1 for each showcase. Several

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[500] Despite the general pGT [V:] > pCh / pTz [V], additional regular shifts in the vowel system occurred in both pCh (see footnotes 109 and 316) and pTz. Lacking a concise reconstruction for pGT, pM evidence is taken, compare to pM **b’ák-al* > pCh **b’äkäl* / pTz **b’akal* (Fox 1978: 126, Kaufman 1972: 95, Kaufman and Norman 1984: 116) but pM **’áhVk’-ab’* > pCh **ahk’äb* / pTz **ʔahk’{a,u}b’.al* (Fox 1978: 177, Kaufman 1972: 93, Kaufman and Norman 1984: 115), because pM [a] > pCh [a] / {#__, __ʔ__, __h__, __#}; pM **b’a:k* > pCh **b’ak* / pTz **b’ak* (Fox 1978: 113, Kaufman 1972: 95, Kaufman and Norman 1984: 116); pM **kéhVx* > pCh **chij* / pTz **čihx* (Fox 1978: 129, Kaufman 1972: 100, Kaufman and Norman 1984: 118); pM **o:ŋ* > pCh **un* / pTz **ʔon* (Fox 1978: 105, Kaufman 1972: 113, Kaufman and Norman 1984: 135); pM **tu:ŋ* > pCh **tun* / pTz **ton* (Fox 1978: 169, Kaufman 1972: 119, Kaufman and Norman 1984: 133). Also refer to the comparison sets between pM and Tzeltalan and Ch’olan (Fox 1978: 51-57 tabs. 5, 6).

[501] Compare for example pCh **b’ahläm* < pM **b’áh(V)l-am* with CHR *b’ajram*, CHN *baläm* and CHL *bajlum* as well as pTz **b’ɅhlɅm* with TZE *bahlam* and TZO *bolom* (Aulie and de Aulie 1978: 7, Fox 1978: 162, Hull 2005: 7, Kaufman 1972: 96, Kaufman and Norman 1984: 116, Keller and Luciano 1997: 39, Laughlin 1975: 84, Slocum and Gerdel 1971: 119). Hence we can transcribe ClM **ba-la-ma** (e.g. PNK St. Randall, J9) / **BALAM** (e.g. YAX Lnt. 1, A5) as *ba[h]lam*.

[502] Compare for example pCh **b’uʔul* with CHR *bu’r*, CHN *bu’u* and CHL *bu’ul* as well as pTz **b’ohtil* with TZO *botil* (Aulie and de Aulie 1978: 12, Hull 2005: 14, Kaufman 1972: 96, Kaufman and Norman 1984: 117, Keller and Luciano 1997: 50, Laughlin 1975: 85). Hence we can transcribe ClM **ka=bu-la** (K2914, Y, Z) as *ka-bu[’u]l*. Incidentally, this is a disharmonic spelling taken as support by Lacadena and Wichmann (2004: 139, 111) for their harmony rule 3. The reconstructable existence of [VʔV] as a lexical nucleus in ClM also challenges the view that [Vʔ] > [V:] in pCh (Houston, Stuart and Robertson 1998: 289, fig. 2) and that [Vʔ] was existent in ClM (Lacadena and Wichmann 2004: 111, tab. 6.3). Also refer to footnote 35.

features noted during the data compilation deserve a special comment regarding their occurrence in the epigraphic record, also because they help to understand the development of the four Ch'olan languages in relation to the antecedent ClM:

(a) *Mediopassives*: There has been some profound confusion regarding several intransitivation processes in Mayan languages, namely the passive, the mediopassive and celeritives (see Chapters 3.1.1.1 and 3.1.4.1). The original pM *<*h*> mediopassive found a shift to passive in several WM languages (including ClM), while retained as a mediopassive in Tzeltalan and fossilised in Ch'olan (except CHL). Greater Q'anjobalan languages (except TOJ) eventually lost the morphological contrast between passive and mediopassive. The ClM $-V_1y$ mediopassive evolved out of the pGT versive that shifted to the positional marker in Tzeltalan (see below). Reflexes of the four pM celeritives following the * *–C-Vj* pattern are found in all GLL languages. Celeritives and mediopassives (as morphological transitivity alterations, see footnotes 361 and 364) both contain an actor-oriented change without any overt agency, celeritives additionally indicating a sudden or unexpected action. Contextual evidence suggests that Ch'olan broadened the celeritive semantics in certain cases and shifted to accentuate the kind of change. This may be expected in ClM as well[503] and a semantic analysis of such forms may clarify on ClM mediopassive semantics. Such breakdown also needs to include $-V_1y$ forms contrasting the passive voice and consider an overall 'anticausative' perspective.

(b) *Nominalisations*: Wichmann (2002a: 11-15) already noted the mandatory intransitive basis to derive an instrumental noun (see Chapter 3.1.5) that is exclusive to Ch'olan languages. The same pattern is also observable with the *–el* nominaliser (see Chapter 3.1.6) in contrast to other *–Vl* nominalisers, hence the same pattern is to be expected in ClM. Tzeltalan and Yukatekan languages allow functional equivalent *–Vl* nominalisations with all types of verbal roots and preferably with transitives, whereas Tzeltalan frequently also favours intransitivised verbs. Among nominalisations, evidence from CHT and WCh shows the existence of a hitherto little noted *–(V)j* intransitiviser with functional equiva-

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[503] A genuine celeritive meaning would be the YUK case *táan u b'uh-k'-ah-al*, "it is splitting suddenly" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 347). Compare to the cognate *–k'* in Ch'olan, e.g. CHR *[l]ajk'i'x nixanab'*, "[m]y shoe has worn out" (Hull 2005: 98), which is rather the change of state from a longer process. But contrast to the use of *–tz'* in the CHR examples *[l]ok'sen intzujy u't e b'u'r twa' achaptz'a*, "[g]rab a pinch of beans to be cooked" with the more sudden *[k]'awtz'a nik'ab' tya' a'ntz'i tu't e rum*, "[m]y hand got bent backwards when I struck it on the ground" (Hull 2005: 17, 69). However, in both cases, a change in appearance is described. Similar is the case of *–p* as in CHR *[w]arix atz'akpa e winik xe' ch'a'r ani ajmok*, "the man who had the illness is now starting to get better" with the unexpected *[e] ixik xe' jak'pa atze'ne tya' uwira watar unoxib' ta b'i'r*, "[h]ow the woman burst into laughter when she saw her husband coming on the road" (Hull 2005: 50, 109). This is in line with the tentative identifications of such forms in ClM, the likely **tz'a-pa=pa=ja TOK'? ?-ja CHAN**[na]**-LEM** < *tz'ap-p-aj-Ø tok' ? chan lem*, "got planted the flint? ? sky-celt" on CPN St. B, B1-B2 (see footnote 82) and **u-xu?-la=k'a BAK** < *uxul?-k'-a-Ø bak*, "got carved the bone" on TIK Msc. MP, A1 (Beliaev and Davletshin 2003), note the ECh *–a* thematic suffix. While no sudden change is recognisable in both cases, the latter fits the semantics for *–k'* in ECh languages (the bone underwent a change of state from uncarved to carved). Another instance, at least by morphological considerations, is the retransitivised **yi=bi=k'e=se** < *y-ib-k'-es-Ø* (NAR K1398, A9-B9), where the thematic is elided by the causative suffix; however, the supposed transitive root **ib* is not attested in GLL languages.

lence to antipassivation (see footnotes 434 and 436). This suffix is also attestable in ClM, where it may be confused with a syncopated passive.

(c) *Thematic / completive suffix*: The indication of the intransitive status marker *–i* was proposed by several authors (Houston 1997: 293, Houston, Robertson and Stuart 2000: 329, Lacadena 2000a: 163-164, MacLeod and Stone 1994: 178) for ClM by the frequent spelling of a final **Ci** __# syllable. Occasionally, it was assumed that this entails a morphophonemic process, resulting in the syncopation of a *–VC* suffix and indicating vowel complexity by a disharmonic spelling. In accordance with the linguistic data (see Chapter 3.1.4.1), I agree with Houston, Robertson and Stuart (2000: 329) that root intransitives are spelled in such a manner[504]. All other occurrences of a final *–i* outside a WCh context do not pertain to the completive marker (see footnote 130) and require alternative explanations[505]. While *–i* as a completive marker of root intransitives is also attested in Yukatekan (Table 47), Tzeltalan does not mark plain status verbs at all and Greater Q'anjobalan retains the pWM status system. But specifically the occurrence of *–i* with certain derived intransitives is a Ch'olan feature that is reflected in ClM.

(d) *Spirant weakening*: When comparing the cognate sets of several suffixes with a final spirant in Ch'olan and Tzeltalan, it is obvious that Ch'olan in general almost regularly features a weakening [x] > [h] and often > [Ø]. Because Tzeltalan as the sibling retains a final spirant, we can assume them to be a reflex of a pGT form. As such, pCh reconstructs **–Vj* forms, e.g. for the thematic of passive and mediopassive verbs (see Chapter 3.1.1.1).

[504] However, I deviate with the authors in considering this as the indicator of a general incompletive narrative time in the inscriptions (cf. Houston 1997: 293-294, Stuart, Houston and Robertson 1999, II: 28-30, 34). The pM intransitive plain status **–i(-k)*, together with the shift from a status to an aspect system in pCh (Kaufman and Norman 1984: 93-94), became the completive status marker (Table 46) in Ch'olan, while the incompletive is an innovation (see Chapter 3.1.4.1). The authors further abrogate the existence of split ergativity in ClM (cf. Houston, Robertson and Stuart 2000: 348-349, Law, Robertson and Houston 2006), therefore they need to reinterpret *–i* as the incompletive to compensate the absence of *–el* in the hieroglyphic record (see footnote 439). Following Kaufman and Norman (1984: 90-92) that split ergativity was present in pCh, I take root intransitive **Ci** / __# spellings as evidence for the completive status, e.g. **ta-li** < *tal-i-Ø*, "he came" (CPN Alt. Q, B4), **hu-li** < *hul-i-Ø*, "he arrived" (CPN Alt. Q, C5) or **CHAM=mi** < *cham-i-Ø*, "he died" (K4692, B5). The linguistically attested *–i* > *–Ø* / … is also visible in the hieroglyphic record by the group 1 spelling **hu-le=na** < *hul-en*, "I came" (PMT P. 2, A2).

[505] The final *–i* is also attested as a thematic suffix in ECh (see footnotes 127 and 390), where it occurs with certain *–C* antipassives, a pattern observable in ClM. We can also infer it as a thematic with the ClM $-V_1y$ mediopassive (see Chapter 3.1.4.1), only in ECh it got lost when $-V_1y$ shifted to a root intransitive marker of certain verbs, while a **=yi** / __# marking persisted. The use of *–i* with certain diatheses parallels ECh *–a* with the passive and the mediopassive. Based on the linguistic data, ClM likely did not require a thematic / status suffix *–i* (see footnote 359) for the regular $-(V_1)w$ / $-(V_1)n$ antipassive, despite the **=wi** / **=ni** / __# spellings, transcriptions like *ch'am-w-i-Ø* < **CH'AM=wi** (QRG St. F, B5) therefore seem more unfavourable as *ch'am-[a]w-Ø*. While Houston, Robertson and Stuart (2000: 329) specifically exclude the positional *–laj* from their list of "single argument predicates" (likely because of the general **=la-ja** / __# spelling), they include the original WCh *–wan* to carry the *–i* suffix, because of its **=wa-ni** / __# spellings and also it occurs in Colonial CHN (but not in CHL), e.g. *chum-van-i*, "he resided" (Kaufman and Norman 1984: 105). This argument can be discarded for two reasons: as an original WCh form, it does not need *–i* as an incompletive marker (although Kaufman and Norman [1984: 107] reconstruct pCh **–la(j)-i* to mark the completive), as the incompletive is *–tal* ~ *–tʌl*, secondly, in an ECh context to which it percolated, it does not need a thematic suffix, as it is no diathesis, but the derivation from a different root class. Furthermore, it would be hard to explain why one positional form would take such a marker, the other not all. A transcription like ** *–wan-i* is rather an over-reconstruction.

A weakening is also observable for the inchoative (Chapter 3.1.1.3), especially between ECh and WCh, while for the perfect suffix, the process must remain speculative, as it is only inferred from ambiguous epigraphic evidence. Especially at junctures, a loss can already be postulated for ClM with **jV** signs absent or just serving as mere visual markers, an argument that gains weight towards the Terminal Classic. Integrative **jV** spellings for suffixes to follow actually provide a strong case for the final spirant being present in a syncopated form (see footnote 37). To retain the spirant was apparently a ClM conservatism that only got diluted in late times by vernacular influences.

(3) *Vernacular traits*: In an extinct language, it is difficult to identify vernacular traits other by a written record or by reflexes in later stages or in attested daughter languages. The case of –*wan* as the positional marking is an ambiguous case: it entered ClM as a WCh vernacular before it diffused into spoken ECh (see footnote 498), but stayed a vernacular in the eastern Maya area in writing. We do not know if ClM was a spoken high variant among spoken vernaculars (getting a 'lower' variant the further genetically away from ClM), similar to the diglossia between High German and Schwyzerdütsch and Lëtzebuergesch in Switzerland and Luxemburg, respectively (as per Fishman's [1967] extended model). The other view, more towards Ferguson's (1959) original model, is that ClM was just a written high variety. Without being able to reconstruct the sociolinguistic situation in Classic times, two assumptions can be made that ClM was indeed a spoken high variety:

(a) *Permeability*: As several authors (see Chapter 1.2.2.3) noted, vernaculars from outside the Ch'olan branch have always entered the ClM to a very limited extent, especially in a situation of true diglossia (as most visible in the codices, see footnotes 118 and 121). Of more interest are developments within the Ch'olan branch that find reflection in writing. The case of positional marking has already been mentioned. Another case is the spirant weakening that ultimately led to the loss of distinction between [x] and [h] in modern Ch'olan languages. Grube (2004d: 79-81) was able to trace this process in the epigraphic data towards the Terminal Classic, furthermore, the spirant loss among suffixes has also been mentioned.

(b) *Exchange*: The Maya area was never a homogenous entity, politically surfacing by the fragmentation into a varying number of city-states (cf. Grube 2000a) within a system of political hegemonies and alliances (cf. Grube and Martin 1998). Courtly interactions do not only require shared acknowledgement of behaviours, symbols and gestures (Jackson 2009: 71-72), but also a shared language to facilitate them. This recalls Riese's (1988: 67-69) "system of higher education" (see Chapter 2.5.3.1) to provide mutual intelligibility in an environment of diglossia. Long-distance trade, which was required for goods like obsidian, salt or hard stone is also facilitated by a shared language and has also been considered as a developmental (thus binding) catalyser of complex societies in Mesoamerica[506] (cf. Drennan 1984).

These considerations imply (pending a more systematic survey) that ClM was not a static written language, but rather influenced by low varieties as a spoken language. These exogenous impulses find their expression in the written record, which nevertheless remained linguistically conservative[507]. Finally, it can be argued that with the collapse of Classic Maya civilisation, several 'antiquated' features of ClM got extinct and hence find no reflex in the modern Ch'olan languages that already began to develop as vernaculars in Classic times[508]. The absence of the *–V₁j ~ –Vj* perfect suffix (Chapter 3.1.7) would be such a case.

(4) *Reflexes*: Additionally, features not comprehensively covered by the daughter languages or reflected by them at all can be reconstructed by evidence from the pTz sibling and the pGT ancestor (or even earlier stages in the development of Mayan languages). This might occasionally include cognate forms found for example in EM languages.

(a) *Absolutive suffix*: The appearance of the absolutive *–aj* in ClM as a reflex has extensively been discussed by Zender (Zender 2004b: 205-208). I agree that the ClM form is a reflex of a pM **–Vj ~ *–aj* marker (Houston, Robertson and Stuart 2001b: 43), mostly found in EM languages (see Chapter 3.1.1.4). As reflexes are still found in proper Q'anjobalan, both pGT and pGQ inherited it from WM, its existence in ClM suggests that today's *–Vl* forms are a WCh innovation that diffused to GLL languages and replaced **–aj* altogether. Hence, a pTz **–aj* is probably apter as a pGT forward reconstruction than **–Vl*.

(b) *Mediopassive*: The ClM *$-V_1y$* mediopassive is only reflected in different functions in a few languages that originate from pGT. This morpheme is a good case to exemplify shifting,

506 This is of minor importance, as long-distance trade continued to function after the collapse without a *lingua franca* enabling economic exchange. Also, too little is known about the transport chains in Classic Maya society and if long-distance traders like the Aztec *pochteca* (cf. Tschol [1998] for the most comprehensive analysis of Aztec trade), in charge by their polity, were conducting supplies of goods, maintaining networks or coordinating the exchange.

507 A good parallel is Middle Egyptian that remained a vernacular for religious texts beyond the Middle Kingdom in the surrounding of Late Egyptian and later Demotic. Compare the autochthonous definition of the writing system with the underlying language on the Rosetta stone (Callender 1984: 197) as *sẖꜣ n(y) mdw nṯr*, "the memory of the words of the god" for hieroglyphic Middle Egyptian and *sẖꜣ n(y) šꜥt*, "the memory of the chest" for Demotic Late Egyptian. Ironically, Ferguson (1959) would consider Middle Egyptian still as a (the?) high variety in the New Kingdom and later times. However, Late Egyptian did not enter as a full writing system before the Amarna period (Junge 2008: 19-20, 31), but vernacular influences are already visible in Middle Egyptian texts of lesser formality, e.g. in letters or administrative acts; to the same extent as Middle Egyptian traits persist in New Egyptian literature. Junge (2008: 21) makes an important point that such vernaculars are "[…] keine unbewußten ‚Ausrutscher' der Autoren in ihre Umgangssprache, sondern die texteigenen Symptome der Sprachgeschichte." These are synchronous developments, but ongoing copying of Middle Egyptian literature is another case, compare to the differences of the Middle Kingdom version of the 'Instructions of Ptahhotep' (p Prisse) and the three New Kingdom copies (Lichtheim 1973, I: 61).

508 As one option, ClM as a once living language and its function across the Maya area can be paralleled to the use of the Beijing dialect of Mandarin Chinese (普通话 *pǔtōnghuà*, "common speech") as the standard variety in the People's Republic of China as opposed to other Chinese languages with a varying mutual intelligibility (cf. Chen 1999: 2, DeFrancis 1984: 56). However, this was only agreed upon in 1956 to establish a 'national language' by central authorities as a nation-uniting device (cf. Chen 1999: 23-24, 26-30), while the Maya area was never politically unified. For the attempts to standardise Chinese in feudal times, see Chen (1999: 7-13).

yet related meanings in a diachronic perspective (see Chapter 3.1.4.1). It functioned as a general versive in pGT, before it was reanalysed as a positional marker in pTz and the mediopassive in pCh, only reflected as an intransitiviser in CHL and as a thematic suffix for intransitives of motion and change of state in ECh.

(c) *Root transitives*: The pM plain status marker of transitives featured two allomorphs **–o-h* / __# ~ **–o-w* / … depending on the juncture. Such a morphophonemic dissociation is only reflected in TOJ, while the modern Ch'olan languages retain *–V* / __# ~ *–Ø* / … instead. Morphophonemics have not been considered by Kaufman and Norman for their pCh reconstruction (see Chapter 3.1.3.1, suggesting a plain backward reconstruction), nor do we have ClM evidence. But the spelling patterns advocate that the distinction remained in ClM and that we have to apply a forward reconstruction from pGT to understand these patterns.

(d) *Perfect aspect*: Originally a pM and pGT perfect participle, pCh and pTz reanalysed ** –oj* as a perfect suffix after the pGT status system shifted to an aspect system (see Chapter 3.1.7). While Tzeltalan still uses the suffix, it did not survive into modern Ch'olan languages and was only retained in ClM. Its existence and morphophonemics can only be proven by the Tzeltalan siblings and forward reconstruction from pGT.

(5) *Diffusion processes*: Several cases observable in ClM are not explainable by reflexes, but rather by diffusion from other branches. As these also retain reflexes of earlier stages (up to pM), some cases are debatable whether a specific form was retained through pWM or is diffused through reflexes of EM languages or pYu. Other forms, respectively their function, are clearly an innovation, some of them can evidently be dated by epigraphic evidence.

(a) *Positional marking*: The diffusion of the intransitive positional *–wan* from a WCh vernacular into ClM and ECh languages has already been explained (see footnote 498). In relation to what I have referred to as a 'downstream transfer', we can elaborate on the sociolinguistics and the probable prestigious value of ClM that led to the ECh change (Wolfram and Schilling-Estes 2003: 715).

(b) *Antipassives*: As the majority of epigraphic data suggests (see Chapter 3.1.3.2), ClM marks the absolute and agentive antipassive with the opposite suffixes than pM did. With the loss of the agentive antipassive in pGT, its **–(a)w* suffix shifted to the absolutive. An ancestor to CHJ innovated **–on*, likely by diffusion from neighbouring EM languages, from where it diffused further through Tzeltalan into Ch'olan and ClM.

(c) *Lexicon / morphology*: A still unresolved question is how many of the lexicon and morphology of a supposed pYu substratum (see footnotes 404 and 433) has diffused into the language of the Ch'olan people that arrived in the lowlands (cf. Josserand 1975). Hopkins (1985: 3) also assumed pYu speakers in the lowlands when Ch'olan speakers arrived from the southeast with a big wave by the shift Late Pre-Classic[509]. The early presence of Ch'olan speaking groups is clearly indicated by the appearance of Ch'olan lexicon and morphology in Late Pre-Classic and Early Classic texts[510]. The evidence for reflexes of a pYu substratum in the inscriptions is rather slim and basically based on phonological evidence (see footnotes 433 and 404). Nichols (2003: 287) considers "[s]ociolinguistic factors of contact and prestige" for substratal retentions, but also admits (2003: tab. 5.2) their low impact in case a mother language feature is reflected in the majority of daughter languages[511]. If we admit a pYu substratum to have survived in ClM, it is extremely limited, but nevertheless a factor to be considered in the analyses. Another possibility to feature a substratum in ClM comes from EM languages, but only if one seconds Mora-Marín (2005a: 75-79) that a language ancestral to Ch'olan was recorded in the writing system of Kaminaljuyu and that it developed into Maya writing[512].

[509] Their migration was supposed to have been caused by the eruption of the Ilopango volcano (east of modern San Salvador), which new ^{14}C data of tephra charcoal rather date to the Early Classic, calibrated around 429 AD (Dull, Southon and Sheets 2001: 28-29), with $p = 0.58$ between 415-476 AD. Much earlier movements can be assumed. In any case, when Ch'olan speakers entered the central lowlands, it is fair enough to consider at least a substratal persistence of pYu with respect to the terminological discussion in footnote 498. It is the result migratory movements and between spoken languages. And it is probably only the result of this language contact that at large became codified by the script when the use of Maya writing emerged. For the majority of the Maya area, i.e. those parts where hieroglyphic records are attested, ClM surely was a high variety of communication not only in writing. It is thus unlikely that it was an imposed language in the sense of a superstratum, although traits are reflected in some modern languages. But others have entirely vanished with the collapse, thus this kind of 'language stratigraphy' is hardly applicable here.

[510] There is a great paucity of early texts, especially with stem-forming or derivational suffixes (Grube 1990a: 48, Justeson 1986: 452-453). Examples (with indication of their Ch'olan morphological fingerprint and cycle indication) are: COL St. Hauberg, D1: **yi=ta** < *y-it-a-Ø* (derived transitive factive, 8.7), H1: **u=TZ'AK=bu=li** < *u-tz'ak-b-ul* (transitive positional, 8.7); TIK Hombre, C8: **i CHUM=ja** < *i['] chu<h>m-aj-Ø* (intransitive positional, 8.18). More vague is the spelling of **TZUTZ=ma** on COL Jd. DO, Ap2 and SBT M. LP, Ap2, for which several authors (Giron-Ábrego 2012, Mora-Marín 2001: 223, 225) have assumed that **ma** indicates the future participle *–om*. While Giron-Ábrego operates with an underspelled, syncopated passive thematic for *tzu<h>tz-[j-o]m*, Mora-Marín works with the transitive root, but this is doubtful, as *–om* is an intransitive participle (see footnote 483). As the San Bartolo text might still date to a pGT stage, we can presume a reflex of the pM **–o-7m* root transitive perfect status (Kaufman 1994, A 3a: 7) and transcribe **tzutz-[o']m-Ø*, "it has been completed" (possibly retaining the glottalised vowel). Alternatively, when assuming a pYu substratum, the spelling might indicate the perfect **tzutz-m-a[j]* with an underspelling.

[511] This is for instance true for the pGT *[t͡ʃ/t͡ʃ'] < pM *[k/k'] shift (Kaufman and Norman 1984: 83-84), as all Ch'olan languages e.g. feature *uch'* as the verbal root for "to drink", which can therefore be reconstructed backwards and forward from pGT to **uch'* in pCh (Kaufman and Norman 1984: 135) and which we only find as *uk'* in ClM. Other cases feature a substratal reflex, e.g. pCh **kab*, "earth" (Kaufman and Norman 1984: 122), but these are few. And yet others were already fossilised in ClM, such as *kan* in the Calakmul emblem glyph (Grube 2004b: 118-119, Martin 2005b: fn. 2). The majority of lexemes features genuine Ch'olan phonology also in pCh, such as *chan*, "sky, snake, four", *chij*, "deer" (**chi-ji**: K5062, N1), *chum*, "sit", *ch'am*, "receive" (**ch'a-ma**: PSD Lnt. 2, C2), etc.; some are backed up by syllabic spellings in ClM (while other morphographic signs have directly received a default Ch'olan pronunciation), although vernacular forms are attested (e.g. **ka-na** < *kan*, "four", EKB M96, P1). Cases like ClM *uk'* vs. pCh *uch'* demonstrate again a certain conservatism in writing that was discontinuous from the spoken language(s).

[512] in this view, the ClM absolutive suffixes *–aj* and *–is* (Zender 2004b) would be such candidates for substratal retentions then, rather than reflexes of pM. An additional constraint is that a migratory movement of the Kaminaljuyu people into the lowlands must have taken place to explain a substratum of highland languages.

The overt phenomena described in (3) to (5), but also in part by (2) require a broader typological explanation[513], especially when the reanalysis and functional shift of a morpheme is involved; or, more generally, the supposed relation between "codeswitching and language change" (Backus 2005). For the purpose of the suffix domain, which contains all derivational and many inflectional morphemes in Mayan languages, it is sufficient to consider *system-altering* (addition and loss) and *system-preserving* changes (Backus 2005: tab. 1), which again can appear as exogenous or endogenous causes. We can also view this as a "change in distribution" and "change in inventory" (Backus 2005: 333), to which I emphasise a diachronic perspective for the purpose of this study.

Historical linguistics works with the basic premise that language splits are sudden, as outlined by Campbell (2004: 165). However, language separation is a gradual process (Wolfram and Schilling-Estes 2003: 716), exploited by the sociolinguistic environment of the speakers (cf. Thomason 2003: 687-688). Initial language change by dialectal variation among speakers spreads in a temporal-spatial interaction (Wolfram and Schilling-Estes 2003: 713). It is on the one hand the contact situation among two separating languages that induces alterations in the morphemic inventory, shifts and reinterpretations from the source language into the receiving language(s) to become the daughter(s). On the other hand, all GLL languages and their ancestors have been in mutual contact for centuries. As the discussion of the showcases has shown, some alterations are explainable from an *ex post* perspective, such as the reconstructed history of the $-V_1y$ suffix which always was related to a semantic patient undergoing some sort of action. The only circumstance we are unable to reconstruct is the sociolinguistic context in which this code-switching took place.

3.2.2 – Epigraphic Hypothesis Conclusions

The epigraphic results presented here can only be of a tentative nature. They are building on observations made in connection with the inference of forms to be expected in the epigraphic record, based on the linguistic evidence. A final evaluation of the epigraphic aspects is only indicated after the analyses of the spelling patterns among the test groups. At least, the considerations given here can have influence on the selection of samples from the epigraphic record and their case classification and attribution to a specific spelling scheme.

(1) *Visual reading aid*: Pending the analyses of the showcase samples, the idea of consistent sign applications in the suffix domain has already been expressed by a variety of authors (Gronemeyer 2011b: fn. 20, Houston, Robertson and Stuart 2001b: 15, Tokovinine and Davletshin 2001), while the implications differ. I propose any **CV** syllabogram to act as a visual reading aid for suffixes under three conditions: (1) the syllabogram (or a specific allograph) allows graphematic suffixation, (2) the sign may reflect a specific suffix function, and (3) its

[513] Thomason (2003: 687) has argued that the processes of borrowing and diffusion are more a linguistic separation based on different methodologies.

vowel may correspond to the suffix vowel[514] or a suffix to follow. The last two premises evoke the morphosyllabic model (with their "iconic" use [Robertson 2004b: 32-33]) to over-specify the phonemic value of a suffix (see footnote 76)[515]. But a syllabogram cannot convey meaning as a cenemic sign and basically serves to provide a phonemic spelling[516]. The idea of a visual reading aid rather has to be understood in terms of 'suprasegmentalia' on a graphematic level[517]. Additional levels of information may be conveyed by a specific sign selection[518]. In the end, all signs applied in a spelling that are not a requirement of the underlying phonology can be considered as 'suprasegmentalia'.

(2) *Neutral vowel suffixation*: The idea of particularly applying **Ca** / __# syllables does not necessarily contradict the visual reading aid principle. As mentioned in Chapter 3.1.3.1, the [a] sound in these graphemes is closest to the pCh and WCh neutral [ə] schwa sound that may have been preferred to indicate the juncture of a morphemic unit. As far as epigraphic evidence is brought forward among the hypotheses, a general tendency to use such **Ca** signs is visible for the suffixes: (1) in all four functions of *–aj*, (2) the root transitive $-V_1(w)$, (3) the nominaliser *–Vl* and (4) with the attributive *–al*; among other suffixes not considered here. Could the shared spelling with **ja** / __# for the passive, intransitive positional and inchoative be the result because they are semantically related, although functionally different? Equally large is the group of **Ci** / __# signs with: (1) the antipassive $-(V_1)w$, (2) the mediopassive $-V_1y$, the instrumental *–Vb*, and (4) the perfect *–Vj*; among other suffixes not considered here. At least for (1) and (2), the **Ci** sign may be explainable by an *–i* suffix to follow in certain cases.

(3) *Synharmony / disharmony alterations*: All disharmony patterns as an orthographic principle can also be considered as suprasegmental graphematics (e.g. Primus [2000], Weingarten [2011] on the representation of long vowels) to either (1) indicate vowel complexity

[514] Boot (2009b: 4-5) independently arrived at a similar conclusion which he calls the "synharmonic vowel insertion", but this principle is not checked against the suffix function.

[515] Houston (1997: 292-293) also proposed a visual marking, although by the time writing, he denied "any morphological meaning" for signs that 'write' grammatical morphemes, although the paper exhibits ideas that ultimately led into the morphosyllabic approach.

[516] The idea that the vowel of the syllabogram indicating the suffix may support the vocalisation of the suffix in spelling group 3 cases is also independent from the suffix function and hence not 'iconic' for a specific allomorph, as both cases can result in two different **CV** signs.

[517] This would impose heterography to distinguish allomorphs for homophonic cases. Parallel to suprasegmentalia in phonology (elements above the segment), we might introduce *suprasegmental graphematics* to describe a semantic markedness on the graphematic level above the segmental units in the graphemic lexicon. A parallel in alphabetic writing systems might be bicameral systems and their rules of capitalisation to distinguish meanings. Compare to the differences e.g. with 'the white house' and 'the White House' or how majuscules in informal writing situations are perceived as 'shouting'. The allographs of upper and lower case are still cenemic signs, but their contextual application provides the reader with information beyond the mere phonemic content (Gallmann [1986: 53-56] calls such signs "supragraphemes"). The same holds true for italic and bold face to emphasise something in a text. Also refer to Primus (2007) for a more theoretical approach on the Roman alphabet rather for grapheme-internal features.

[518] This proposed principle may also account for other spellings to indicate a special meaning and is not necessarily restricted to grammatical functions. Compare for example to the use of anachronistic signs when referring to earlier events (see footnote 110).

(Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004, 2005b, Robertson et al. 2007) or (2) provide the vowel of an underspelled suffix to follow (Bricker 1986: 133, Justeson 1989: 35, Mora-Marín 2003a, 2004a). As long vowels were likely not retained in ClM (see Chapter 3.2.1), disharmony might still account for glottalised vowels and probably for aspirated vowels, although all models consider the latter unmarked. However, with the abolition of long vowels, lexeme nuclei (and also suffixes) have a significance too small to explain the abundance of disharmonic spellings. Some other explanations may be taken into account. What surfaces as disharmonic spellings in writing may possibly have not the one and only explanation with strict rules. There may be (additional) contextual explanations of why a certain word or form is spelled with disharmonic signs, the visual reading aid is one of them, but others may involve graphematic and/or linguistic premises.

(a) *Underspellings*: As Zender (1999: 130-142) convincingly demonstrated, final weak consonants are frequently underspelled, as well as in certain morphosyntactic environments. Mora-Marín (2003a: 14-15, 18-21, 2004a: 5, 8-9) within his affixation conventionalisation hypothesis broadened this idea especially for *–Vl* suffixes to be regularly underspelled in possessive phrases[519], a principle also acknowledged by other authors (Boot 2009b: 7, Lacadena and Wichmann 2004: 118). The consideration of the affixation conventionalisation hypothesis has to be split up for the scope of this study. It is less comparable with suffixes to follow the lexeme in predicting underspelled suffixes by disharmonic patterns on a regular basis, while I consider them to be exceptional. However, it is helpful for *–V* suffixes, especially for the root transitive marker, when it is realised by syllabograms without an additional **wa** sign reinforcing the suffix on a graphematic level. Another case only later considered by Mora-Marín (2010a: 134), but more important for this study, is a *–VC-V[C]* suffix string that may be underspelled, but otherwise appears

[519] While certain spellings certainly follow this principle (to be categorised as 1.g.i spellings), I would not postulate a conventionalised **CV$_1$-CV$_2$** < *CV$_1$C-V$_2$[C]* spelling rule as Mora-Marín does. Except the thematic *–aj* and the root transitive *–V$_1$(w)* with only few instances cited, he restricts the examples to *–Vl* suffixes and also applies it to cases, where no *–Vl* suffix would be needed in Ch'olan languages, e.g. with possessed kinship termini. Here, he supposes the disharmonic **CV$_2$** sign to mirror the vowel that would otherwise appear with the absolutive suffix. This is a problematic assumption, as the Ch'olan *–Vl* generic absolutive (Table 21) is an innovation and we do not know the ClM absolutive for kinship terms (Zender [2004b: 204-205] assumes *–Ø*). Other instances of nouns taking a *–Vl* suffix upon possession are pending a more systematic survey in the corpus. Mora-Marín (2004a: 10) himself admits that in many instances "an *–il* suffix was likely present […], though not necessarily all" spellings are supposed to indicate the suffix. But with spellings in an identical morphosyntactic and semantic context, there is no either/or claim to be made for a mandatory suffix due to linguistics. It remains unclear how Mora-Marín intends to differentiate such conflicts, I infer that he tries to generalise the exception of underspellings as an orthographic rule. Most importantly, Mora-Marín fails to provide quantitative evidence of how often such underspellings occur, but consequently following his approach and examples, any **CV$_1$-CV$_2$=lV** spelling (e.g. **u=tz'i-ba=li** < *u-tz'i[h]b-al* on K5022, A2) has to be a redundant overspelling (cf. Houston, Robertson and Stuart 2001b:7-10, 11-12, 24-30 for cases). The occasional purely morphographic rendition of the root lexeme, e.g. **u=CHAN** < **u-chan[-ul]* (YAX Lnt. 1, A7), is also not covered, as a syllabogram to provide the suffix vowel is absent, as in the abundant **u=CHAN^{nu}** spellings (e.g. YAX Lnt. 2, O1). Also, such cases are not necessarily suitable for a valid reconstruction, as **u=CHAN-na** < *u-chan-a[l]* (MQL St. 6, B2a) shows. The hypothesis has also not accounted for all functional instances, e.g. ****u=ba-ke** would be a valid example for the part/whole possession *u-bak-el*, but such and analogous cases are not recorded in the corpus.

as a ‘regular’ suffixed form in writing, compare **yu=k’i=bi** < *y-uk’-ib-i[l]?* (e.g. K531, F1) with **yu=k’i=bi=la** < *y-uk’-ib-il*, (e.g. K8728, C1). Cases like these may be a good explanation of why **bi** appears to be the preferred syllabogram to indicate the instrumental instead of a ‘neutral’ **ba**. However, these cases also require a contextual analysis before the spelling scheme attribution to determine if an underspelling is really existent: that (1) the noun is possessed, and if so, (2) to which noun class does it belong, (3) how does the possessed relate to the possessor (position in the syntagma), and (4) is the possessor named (see footnote 258).

(b) *Overspellings*: Strictly speaking, the phonological structure of the graphemes would only allow overspellings at the [C.C] border of syllables, within a lexeme (especially among loanwords, see footnote 36) or a morpheme string. Examples are inserted graphemes to indicate an aspirated vowel, as e.g. **chi-ji-la-ma** > *chihlam* [t͡ʃih.lam] (K1728, I’1-I’2) as well as genuine *–CVC* suffixes, e.g. **e-ke=wa-ni=ya** < *ek-wan=iy* [ʔek.wa.niy] (TRT Mon. 6, N2). Cases of syncopation (see below) also account to this category, e.g. **yo=ko=bi=li** < *y-ok-b-il* [jok.b’il] (PAL T19B-W, A3), though these spellings are the result of a morphophonemic sound change. In a broader and novel sense, syllabic spellings like **u-tz’u** < *u[h]tz’-u* [ʔuh.t͡s’u] (NAR K1398, G1-H1) or **hu-li** < *hul-i* [hu.li] (NAR St. 29, G17) with a final *–V* suffix are also a morphosyntactically required overspelling, as the final vowel must not remain silent. Even more are those *–V* suffix forms a deliberate overspelling where an entire **CV** sign is used, e.g. **u=cho-ko=wa** < *u-chok-o* [ʔu.t͡ʃo.ko] (DPL St. 8, D5). The root transitive marker (Chapter 3.1.3.1) is so far the only secure case where the overspelled sign serves as a redundant visual reading aid (see footnote 317). The **ja** sign among the passive thematic marker (Chapter 3.1.1.1) might also be such a case, at least in late and possibly vernacular contexts by a conservative spelling. In the cited examples, the overspelling is not required by internal syllabification, but appears at a juncture that under ‘normal’ circumstances would spell a ‘mute’ vowel.

(c) *Sound changes*: Equally important to graphematic premises that may induce harmony pattern changes are morphophonemic sound changes in the spoken language that may their reflection in writing. However, except being a more or less consistent pattern, sound changes may be the result of a variety of reasons, they are always contextual and may appear as the infamous ‘exceptions’ in writing. (1) Syncopation has frequently been addressed to be indicated by harmonic spellings before the syncopated (or consonant only) suffix, typically in the first position after the root (see footnotes 37, 85, 105, 355, 357, 436, 437 and 479), e.g. **e-ke=li=bi** < *ek-l-ib* (CRN P. 2, O8). Frequently cited epigraphic examples apply this pattern, so it has a significance for further consideration. But their synharmonic root spelling is rather the opposite of what is considered for any disharmonic principle, although original disharmonic spellings may find alteration. (2) The apocope is only securely traceable on a diachronic basis (see footnote 84), e.g. with the development of the thematic suffix *–aj* > *–a* (see Chapter 3.1.1.1) among spellings that start to omit the final **CV** sign (if not considered as underspellings)[520], which eventually may result in a deviant harmony pattern, e.g. **jo-ch'a** < *jo<h>ch'-a* (ITN St. 17, K2). (3) Lenition may signal a vernacular form[521]. Debuccalisation processes like [C] / __# > [{h, ʔ}] > [Ø] may result in what would appear as an underspelling and possibly with differing harmony patterns[522]. As lenition processes at junctures are more the result of spoken than written language, it is likely uncommon to find them indicated by spellings in formal texts[523], except possibly in direct speech. (4) Epenthesis is a process so far not securely recognised and systematically investigated in ClM (see footnotes 320 and 357). It is generally rare in Mayan languages, as consonant clusters are uncommon[524]. As Mayan languages prohibit a vowel hiatus, the epenthesis of a glide or glottal occurs (see footnotes 140 and 374), but this does not necessarily require harmony alterations; if, at all, a **V** or **CV** sign insertion or alteration (as possibly with **u=pa-ta=bu=hi** < *u-pat-bu-hi* on CPN Alt. Z, D3). (5) Assimilation processes, as discussed for the antipassive (Chapter 3.1.3.2) and the perfect (Chapter 3.1.7) do not necessarily result in harmony rule alterations, as it is the result of underlying morphophonemics. Consistent reading aids stay the same, regardless whether they are syn- or disharmonic, e.g. **yi=ta=ji** < *y-it-aj* (NTN Dwg. 88, D1).

(d) *Syllable weight and stress*: Another approach that initially looks promising to explain a certain amount of disharmonic patterns on a regular bases is stress. Stressed syllables in Ch'olan languages may result in prolonged vowels and stress is also regularly put on already aspirated and glottalised vowels, as visible in the phonological descriptions of CHL

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520 Considering Mora-Marín's affixation conventionalisation hypothesis, certain disharmonic spellings may be the result of elision of a final consonant in certain phonological environments (by means not accountable to explain all disharmonic spellings), thus a synchronous feature. Debuccalisation (see below) may also be involved, but it is beyond the scope of this study to pursue this question further on a systematic basis.

521 For example **K'U'=u-lu** < *k'u'-ul* on YUL Lnt. 1, C2, probably with a Yukatekan reading for the sign AMC. This suffix spelling with a vowel sign might reinforce the glottal coda instead of the Ch'olan *k'uh*, for which we have overspelled examples, as **u=K'UH=ju-lu** < *u-k'uh-ul* (with /j/ ~ /h/) on YAX Lnt. 25, E1a (Gronemeyer 2011b: 327). This is only indirect evidence, though.

522 No example has yet been described for ClM. Most evident would be cases where $[C_1] > [Ø]$ / __# #C_1, e.g. YUK *k'á'aw wíinik* > *k'á'a wíinik* (Orie and Bricker 2000: 296). For an overview of lenition and deletion processes in Ch'olan see individual descriptions in CHL (Attinasi 1973: 54, 63, 69, 77, Schumann Gálvez 1973: 20, 21), CHN (Knowles 1984: 56, 58-61) and CHR (Fought 1967: 112-113). The implications for spellings can be twofold: (1) the reduction of a lexeme and/or inflected form by one **CV** sign and possibly (2) the merging of the reduced first lexeme with the second in spelling. Harmony rule alterations may be the result.

523 Two major exceptions are known. One is [h] > [Ø] / #__V with ergative affixation (see footnotes 431 and 743) and dialectally (?) as far as *ha'*, "water" is concerned in compounds among texts from the eastern regions (Stuart and Houston 1994: 52), e.g. in the toponym and emblem glyph **YAX-a** < *yax-a[']* (Stuart 1985c). The second is the regular change within the agentive *ch'ah-om* < *ch'aj*, as it is also indicated in writing: **ch'a-ho=ma** (e.g. K1453, D1) vs. **ch'a-ji** (e.g. IXZ St. 4, B2b). However, we have **4=ch'a-jo=la** < *chan ch'aj-ol* (QRG St. A, D7) that may (1) indicate that lenition is subject to surrounding morphophonemic conditions or (2) just be a result of the orthographic loss /j/ ~ /h/ in the Late Classic.

524 We might expect schwa sounds phonetically in consonant clusters (cf. Orie and Bricker [2000: fn. 3] for YUK), but likely without any reflection in writing, as it was phonemically not contrasted with the five vowels of the syllabic grid. Otherwise, loanwords (cf. Attinasi 1973: 75-77, Knowles 1984: 66, Orie and Bricker 2000: 299-301) may require a [ʔ] onset (automatically by **ʔV** or **ʔVC** signs) or a [h] coda epenthesis (by a **hV** sign or underspelled) when not compliant to the canonical forms (see Table 3).

(Attinasi 1973: 33-35, 53-54), CHN (Knowles 1984: 37, 61-62), and CHR (Fought 1967: 48-49). In that sense, it is less vowel length (as a distinctive feature in minimal pairs), but in more general terms a heavy syllable where stress is put on. As syllabograms are always light (see footnotes 12 and 13), it is a nearby assumption that disharmonic spellings are applied to indicate that stress is put on a syllabic nucleus. With bisyllabic lexemes, this would be on the last syllable, e.g. **yo=to-ti** < *y-otot* *[jo.ˈtot] (CHN ADz, G2) and **yi=tz'i-na** < *y-i[h]tz'in* *[jih.ˈt͡s'in] (CRC St. 6, C22). Such patterns would fit the premise that open syllables (whether they are light or heavy)[525] are always unmarked and often synharmonically complemented when other syllables follow. The converse argument thus would consider a first syllable stress for bisyllabic lexemes that are synharmonically spelled, e.g. **pa-ka-la** < *pakal* *[ˈpa.kal] (PAL TISL, 40). But synharmony does not necessarily account to closed light CVC and disharmony to closed heavy CVhC syllables, hence a correlation needs to be sought whether disharmonically spelled monosyllabic lexemes feature stress or not, e.g. **cha-ya** < *chay* *[t͡ʃaj] (YAX HS. 3 I tr, D6) and **ba-ki** < *bak* *[ˈb'ak] (BPK Str. 1 R2C41, A2), while heavy syllable lexemes are usually unmarked, e.g. **bu-ku** < *bu[h]k* *[ˈb'uhk] (NAR K1398, L1). In the end, harmony rules might also indicate vowel allophones, where in analogy to the harmony rules discussed so far synharmony indicates a shortened vowel, e.g. **cha-ya** *[t͡ʃəj] or **je-le** *[xɛl] [-STRESS], while disharmony indicates a regular or lengthened vowel, e.g. **ba-ki** *[ˈb'ak] or **su-ku-na** *[sʊ.ˈkun] [+STRESS]. Of course, such a model would primarily account for mere roots, as inflection or derivation may shift the stress to another syllable (cf. Knowles [1984: 61-63] for CHN)[526] and shifting harmony patterns are the requirement of vowel-providing spellings. The present hypothesis sketch is just based on a handful of epigraphic examples and is by no means backed up by specific linguistic evidence for each form. It also does so

[525] In fact, most bisyllabic CV(h).CVC lexemes are spelled by **CV_1-CV_1-CV_2**, hence the stress is on the second syllable. Cases like *–i[h]tz'in* with a heavy open first syllable would otherwise be ambiguous with another two-mora syllable. There are a few bisyllabic words spelled with double disharmony **CV_1-CV_2-CV_1**, e.g. **mi-ya-tzi** < *miyaatz* (K1457, H4) which still would carry the stress on the last syllable, as the first disharmony pair is conditioned by the phonology. Stress is in most instances put on the last syllable (cf. Fought [1967: 101] for CHR, Fox [1978: 37-46] for pM, Knowles [1984: 62] for CHN, Schumann Gálvez [1971: 35] for ITZ, [1997: 54-55] and MOP).

[526] However, many inflected or derived forms are actually spelled with a syllabogram indicating the suffix whose vowel is often disharmonic, e.g. **u-to=ma** < *u[h]t-om* *[ʔuh.ˈtom] (NAR St. 35, F8). Synharmonic suffix spellings, e.g. **bu-bu=lu** < *bub-ul* *[ˈb'u.b'ul] (PNG P. 2, J'2) again might therefore indicate that stress is still put on the first syllable, containing the root onset. Such suggested stress patterns also bear the explanation for syncopated suffixes in order to retain a bisyllabic shape, e.g. **²tzu=jo=ma** < *tzu<Ø>tz-j-om* *[t͡sut͡s.ˈxom] (TRT Mon. 6, O2). Of course, not all spellings (despite the underlying phonology) adhere to this proposed pattern, such as group 2 spellings, e.g. **chu-ku=ja**; or spellings for *–V_1C* suffixes indicated by fixed **CV** syllabograms that unavoidably may become synharmonic. However, the probability might have been reduced by the scribes. The *–V_1y* mediopassive indicated by **yi** / __# is not attested with any CiC verbal root (cf. Wald 2007: fig. 116). The **=wa** / __# spelling among root transitives is in any case a speciality, as it is a mute overspelling, but it may have been chosen to indicate stress on the marker, e.g. **u=bu-t'u=wa** < *u-but'-u* *[ʔu.b'u.ˈt'u] (PAL PT, N11), even when synharmonic, e.g. **u=ma-ka=wa** < *u-mak-a* *[ʔu.ma.ˈka] (MQL St. 5, A3). It would actually be interesting to observe how many CaC root transitives are used in indicative mode in contrast to other CVC roots. The idea of neutral-vowel **Ca** spellings would not necessarily contradict the disharmonic spellings for stress patterns.

far not consider preferred patterns of disharmonic vowel pairing (as implicated by the 'rules' developed by Lacadena and Wichmann [2004]) and their potential supragraphematic meaning. The answer whether stress was indicated is also difficult to pursue in the present thesis. While orthographic patterns are the main scope to reconstruct a ClM vocalisation, the restriction to interactions at morphemic boundaries will disregard lexemes. More importantly, rather than by epigraphic evidence, ClM stress patterns require backwards reconstruction by historical linguistics, which has never been done before. Partly related to stress are ablaut alterations (DuBois 1985) that have thus far only been described for SAK among possessed nouns (together with semantic shifts). The only ablaut alteration in Ch'olan I am aware of mostly concerns [a] and [ə] (also see Chapter 3.1.2.1) in CHL (Attinasi 1973: 56, Schumann Gálvez 1973: 19) and CHN (Knowles 1984: 62-63)[527], which was not distinguished in Maya writing (but perhaps present in the spoken ClM language). It is possibly unlikely to find ablaut alterations as an explanation for shifting harmony patterns. Other allophonic marking might also be possible and include consonants.[528]

(4) *Contextual morphographs*: Though not explicitly discussed among the spelling proposals, some studies broaching aspects of the showcases introduced the idea of contextual morphographic readings. Since these ideas have impact on spelling scheme classification, a short excursus is appropriate. Wald (2007: 111-115) considers the spelling **chu°ku=ji=ya** on CNK Trn. 1, K1 to actually represent a localised morphograph ****CHUK** (or alternatively ****CHUK**$^{\mathbf{ku}}$)[529]. Mora-Marín (2004a: 13-14) expands the range of contextual readings by

[527] These changes, e.g. CHN *bák* > *ʔu bäké*, are the result of [a] > [ə] / __ [-STRESS], when the stress is shifted to the suffixed morpheme. Under the made assumptions, it would be viable for ClM: **BAK**$^{\mathbf{ke}}$**=la** *[b'ək.ˈel] (CML U. 26 Pdt. 15, A6). However, contradicting would be the regular suffixation with **le** / __#, such as **u=BAK=le** (CML U. 26 Sp. 6, A5), which is favoured as the "synharmonic vowel insertion" for spelling group 2 cases superseding the stress patterns.

[528] Gordon Whittaker (written communication, April 27, 2013) suggests that disharmonic spellings might indicate palatalised consonants. For example, [tʲ] is the standard allophone of /t/ in Ch'ol (cf. Attinasi [1973: 86-89] for allophonic conditions). In certain dialects of modern Ch'ol, [t] and [tʲ] may also have a functional load to distinguish loanwords from native lexemes (Josserand and Hopkins 2005: 418). Sources that indicate palatalisation bring forward examples without neglecting the theory of stress indication, e.g. **mu-ti** < *mut* *[ˈmutʲ], compare to CHL *mútiö*, "Vogel" (Stoll 1884: 54). For other consonants, this scheme is less obvious, e.g. /n/ > [n] / __# and / __i (Attinasi 1973: 62-63), although sometimes /n/ > [nʲ] / __# with an echo vowel to follow, hence **TUN**$^{\mathbf{ni}}$ will likely still spell *[ˈtun] and not *[ˈtunʲu̥]. The phonemics of other Ch'olan languages are less extensively investigated to allow a contribution and formulate common rules, but we also find regular allophones, e.g. nasalisation /n/ > [ŋ] / __# in CHN (Knowles 1984: 49). There is however a distinction between vowels and consonants: syllable weight and stress with their vowel allophones are mostly independent from neighbouring phonemes; they carry a syllable's prosody, while consonant allophones do not. Thus, if [tʲ] is the rule in CHL, no markedness would be necessary; otherwise all (CV)CVt lexemes would require a disharmonic spelling. This is not the case or not consequently exercised, e.g. **cha-pa-ta** < *chapa[h]t* (K1256, U3). Also, the consonantal onset could not be indicated due to the CV structure of syllabograms, e.g. **TUN**$^{\mathbf{ni}}$ < *tun*, cf. CHL *tiun*, "Stein" (Stoll 1884: 60).

[529] Wald brings the argument forward that syllabograms commonly get infixed in morphographs. I also rather consider the spelling a conflation rather (as no other sign shape is visible within), note the separate **chu-ku=ji=ya** on YAX HS. 3 III, C9b; and there are enough examples of syllabogram conflations, e.g. **a-k'a°ba** < *ak'ab* (PAL CREA, D1). We deal here with a synharmonic spelling and a syncopated thematic suffix for *chu<h>k-j-Ø=iy*. The case of the supposed ****CHUK** is also the only case Wald brings forward, while other instances are imaginable, e.g. **k'a°ba=si** < *k'ab-[i]s* (e.g. TIK MT 48, A7a) as ****K'AB=si**, which is indeed considered as a morphograph by

> proposing "polymorphemic logographs" that may (among 'regular' polyphony) carry inflected readings in case expected syllabic signs to indicate affixes are absent, e.g. MZS as **CHOK ~ **CHOKOW ~ **CHOKAJ** or AT9 as **ICH'AK ~ **YICH'AK**. Rather, such instances, e.g. among **u=CHOK ch'a-ji** (BPK St. 1, G3), are to be considered as conveying exactly what they spell: *u-chok-Ø+ch'aj* as a compound with a nominalised verbal root (less likely with underspellings, hence *u-chok[-o]-Ø ch'aj*). This study will not use such morphosyntactically augmented readings[530], as all environments where they are desired to be applicable can be explained with more simple and well established rules: morphosyntax, abbreviations, and underspellings.

In the end, most aspects examined here somehow relate to the question of harmony patterns. When restricting the discussion to pure syllabic spellings for the sake of simplicity, the first sign in any string is always determined by the root vowel and thus a phonological prerequisite. String-medial signs are more the result of morphographematics, reflecting the morphophonemics of suffix vocalisation. The final sign that usually has the last mute vowel is the only one which really can be subject of harmony patterns, among other decisions like the visual reading aid. Hence, it is primarily a graphotactic choice, but possibly reflecting phonological features.

It is important to keep such a distinction for choosing a specific sign in mind. Most signs used in a spelling certainly reflect the underlying phonology and are used to support a phonemic spelling. Others are more the requirement of suprasegmental graphematics following whatever rules. Having reached these conclusions also in a broader theoretical environment, the deduction is that a multitude of previous studies has shown that it is detrimental to first focus on the epigraphic evidence and then turn to the linguistic foundations. Such an approach will always lead to linguistic reconstructions (almost an epigraphic 'planned language') that do not fit with the actual evidence from modern languages or from historical linguistics. The discussion about the harmony rules is the best example, but also when considering morphosyntactic premises (e.g. see footnote 431). As all linguistic foundations for the thesis showcases have now been laid out, the testing of the epigraphic evidence against them can commence.

several authors (Boot 2009b: 100, Zender 2004b: fig. 8.2b). Following this suggestion, the spelling from PAL CREA would be ****a-K'AB** rather, and a rare case of a mixed spelling (see footnote 15).

[530] I am only aware of one potential exception where an inflected reading may be represented by a graphotactic convention. This is the 'crack' conflated with certain signs to possibly ready **SIYAJ**, as in the name of *Siyaj Chan K'awil* carried by two Tikal rulers and potentially among the name of Tamarindito Ruler 8 and a supernatural known from several monuments (Gronemeyer 2013: fig. 16, fn. 21). While readings with stem formative suffixes can be neglected, lexicalised derivations among morphographic signs are attested, e.g. ZVF as **JUKUB**.

3.3 – Analyses

THIS CHAPTER REPRESENTS THE SOLID ROCK of facts and figures on which the interpretation of the data can be built. The first analytical step has been conducted by collecting the samples from the sources and deciding on their applicability as a showcase, as per the workflow explained in Chapter 2.3. Following the analytical process outlined in Chapter 2.4, the samples of the data base are categorised and queried by their parameters, applying the multi-tier approach to correlate several parameters.

These raw data require the third analytical step by applying the statistical methods detailed in Chapter 2.5.2. This step is the first interpretational level, as it prepares the data in terms of the hypotheses from Chapter 2.5.1. Only with the data refined, arranged and calibrated by the tools of mathematics, a reasonable interpretation on the graphematic and ultimately the linguistic level is possible. As exemplified in Chapter 2.5.2, the results of the data base queries are visualised in histograms. Also, the testing of null and alternative hypotheses takes place, as well as further tests regarding statistical errors. The focus clearly lies on the easy access of the information with only key figures relevant for the further discussion, the full set of figures and samples is provided in Appendix C.

Several introductory analyses evaluate the sample significance. The main part of the chapter focuses on the spelling groups (as per Chapter 2.2.2) as the key factor to define orthographic conventions and to correlate them with the underlying linguistics. The statistical analyses of the samples are divided into three major chapters with a particular focus.

Chapter 3.3.3 starts with an overall analysis of all samples pertaining to a spelling scheme – so to say the ‘master analysis’ to test all data against the null and the alternative hypothesis. In a next step, the analysis is taken to the more granular level and investigates the spelling schemes on the functional level for each showcase group (as defined in Chapter 2.1.6).

Chapter 3.3.4 is concerned with the analysis on a spatial basis, following the regions defined in Chapter 2.5.4. This data set is reduced in number, as not all samples could be attributed to a region. The overall analysis compares the distribution of spelling schemes across the regions, while the following analyses downscale to individual regions and test the hypotheses independently.

Chapter 3.3.5 does the same on a temporal basis, again working with a reduced quantity of samples, as the attribution to a specific *K’atun* interval was not always possible. To overall analysis compares the distribution of spelling schemes across time. The time span of samples stretches across 65 *K’atun* intervals, many of them void or with an insufficient quantity. Only exemplary intervals receive an individual testing against the hypotheses, considering the following theories made so far in the research: (1) the prevalence of morphographic spellings in the Pre-Classic and Early Classic, (2) the standardisation of writing in the Late Classic, (3) the dissolution of disharmonic patterns by the end of the Late Classic, (4) the increase of syllabic spellings at the same time, and (5) post-collapse adaptations.

Finally, Chapter 3.3.6 conducts combined analyses to take special notice on patterns observed in the single analyses and scrutinise them in a multivariate approach, i.e. to correlate a specific showcase group with spatial and/or temporal data. As a summarising conclusion, Chapter 3.4 also provides the individual results ranked (like H_1 falsified, but H_0 not proven true). In a permutated matrix, these results help to identify foci for discussion (e.g. abnormalities only for a specific suffix function in a certain region and/or during a specific time).

It is important to stress that the analyses do not yet provide direct evidence for the linguistic hypotheses drawn in Chapter 3.1. Although the spelling scheme assignment is correlated to the linguistic premises, the testing against the null and alternative hypothesis is only suitable for the graphematic rendition of spoken language. Spellings groups 2 and 3 are per definition lacking any informative value about vocalisation and its realisation in writing: the reader has to 'insert' the appropriate vowel by his linguistic competence. Only spelling group 1 examples intend a full phonemic orthography. Yet, even if the analyses proof a statistical significance of spelling group 1 (at the same time falsifying H_0), it is highly indicative, but not linguistic proof. Chapter 4 needs to critically review the results of the statistic analyses against the linguistic hypotheses and in the light of the reconstructed language itself discuss the variety of orthographic choices and rules.

3.3.1 – Evaluating the Data Base Methodology

Before the analyses can take place, it is apt to evaluate the sample processing and highlight observations of the data collection and processing. The data base is primarily organised by tables per lexeme. The premise was to equate them with roots as lemmata as far as possible. But it was also deemed necessary to separate some derived stems for a clearer separation of the showcase groups. This concerns some derived transitive verbs from nouns, e.g. the noun *tz'ihb* to form inchoative verbs and the verbal stem *tz'ihb-a* for passive derivations.

The identification of a lexeme, its part of speech, reading, semantics and translation based in large parts on earlier research and dictionaries available, following Boot (2009b) as well as Kettunen and Helmke (2010). Where discussion is needed on aspects of the decipherment, appropriate note will be taken. The spelling hypotheses made in Chapter 3.1 for each showcase group in conjunction with the methodology to identify a glyph's syntactic role (Chapter 2.3.2) also aided the identification of hitherto unrecognised lexemes and their lexical class. The range of these discoveries reaches from full decipherments (on the basis of relevant linguistic evidence from Colonial and modern dictionaries) via decipherment proposals or partial readings to mere interpretations of undeciphered morphographs. The methodology was also able to assign a proper choice among homophonous lexemes or decide on the applicability to a showcase by its role in the syntagma. Like with lexemes, the spelling hypotheses also facilitated the identification of certain samples as pertaining to one showcase by their suffixation patterns which have not been recognised previously.

The definition of the spelling groups and their specification in spelling schemes as done in Chapter 2.2.2 has not always facilitated an unequivocal assignment. Spelling group 4 was initially considered to act as a repository for doubtful samples segmentation and applicability, based on the current state of research. However, the hypothesis formulations of Chapter 3.1 already clarified many issues, allowing samples to be excluded or categorised within groups 1 to 3 that initially would have accounted for group 4. Especially scheme 4.a.iv proved to be mostly irrelevant as far as the showcases are concerned.

Two issues concerning the spelling scheme definition are of a bigger concern. The commitment to separate only between synharmonic and disharmonic root spellings proved to be defective for lexemes that do not appear (1) in a spelling without any suffix, and (2) without any phonemic complement in case the root spelling is morphographic. Especially lexemes of low frequency with just one or two instances known are concerned. The definition of a third category "unknown harmony pattern" would have remedied the situation. Thus, all unknown harmony patterns are taken as 'synharmonic' per default. The six schemes of synharmonic roots (1.a, 1.b, 2.a, 2.b) comprise 32.6% of all samples (compared to 4.9% of disharmonic schemes), while the unknown or at least doubtful cases range around 5% of all samples. Cases of morphographic roots without any additional syllabogram pertaining to scheme 2.e are not concerned, as from a graphematic perspective, these spellings are unmarked regarding their harmony rules.

The second problem is immanent in the orthographic principles themselves and concerns the distinction between #.#.i and #.#.ii schemes to distinguish the harmony patterns between the final syllabogram of the root and the one indicating the suffix. Under the question of shifting harmony patterns, as advocated by several authors (Houston, Stuart and Robertson 1998: 284-285, 291-292, Lacadena and Wichmann 2004: 115-116), this system is not immediately able to trace such features, either across regions or over time. Shifts from one suffix disharmony pattern to another one (e.g. common transitive =**wa** vs. infrequent =**wi**) are not indicated by the scheme. Also, the schemes separate disharmonic spellings from those which necessarily have to be synharmonic, when the suffix syllabogram mirrors the root vowel (e.g. in **u=tz'a-pa=wa**). However, a careful data processing including the transliteration is able to distinguish between such cases[531].

3.3.2 – Introductory Analyses

The major question concerning the samples in the data base is to what extent to what extent they are representative as a section of the whole corpus. Chapter 2.5.2 postulated a correlation and therefore a statistical significance for both the lexeme samples as well as the suffix functions and forms. This

[531] Here, another intriguing question evolves: was there a tendency in writing to avoid such cases, e.g. by alternating a verb's diathesis? How often have transitive CaC verbs been recorded as passive forms to ensure a synharmonic **Ca-Ca=ja** spelling in contrast to other CVC transitives to pursue a consistent disharmonic spelling by **CV-CV=wa**? Chapter 3.3.6.3 investigates this question on a statistical basis for some showcases and morphemes.

assumption can now be tested against Zipf's law (Zipf 1935: 40-47) by charting the samples against the ideal distribution:

$$p(n) \sim \frac{1}{n}, \text{ with } n \text{ indicating the rank.}$$

Samples for a total of 223 different root morphemes have been gathered, containing the full range of decipherment premises (see Chapter 1.2.1.3). Although a few of these lexemes do not contain any sample pertaining to one of the showcases at all, additional samples were collected to provide supporting spelling schemes and data relevant for related suffix functions and forms. A remainder of 219 lexemes contains at least one showcase sample.

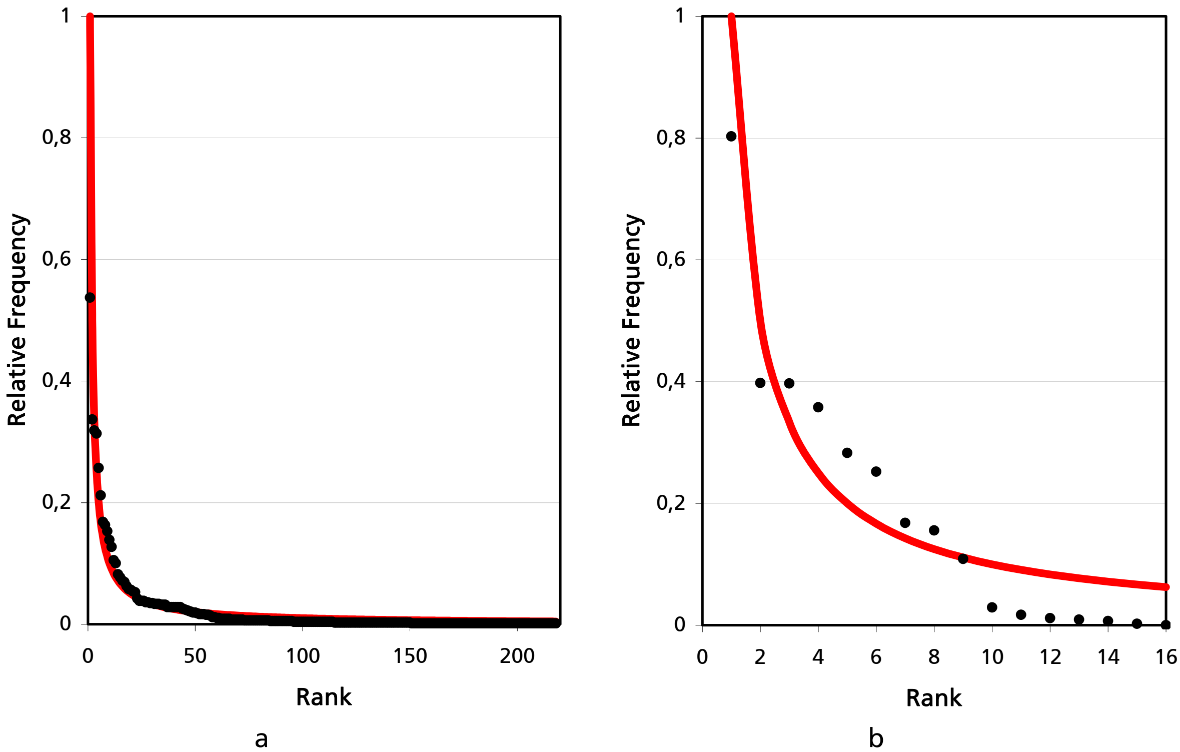


Figure 15: Distribution of the samples pertaining to a showcase group (individual dots) with N_S := |3890| against an ideal Zipfian distribution (continuous line). **a)** Plotted by root morphemes with N_R := |219|, **b)** Plotted by showcase groups with $N_{F(i)}$:= |16|. Sven Gronemeyer.

Even though not all lexemes and from these not all attestations can be considered among the samples because of the confining nature of the showcases[532], the selection nevertheless approximates a Zipfian distribution (Figure 15a). However, this one is different from the one that would comprise of the lexemes of the whole corpus and ranks other lexemes highest and yet others lower. Pending such a distribution, it is reasonable to rank the prepositions *ti* ~ *ta* first and also to consider the nouns for the Long Count, *Tzolk'in* and *Ha'ab* high up.

The data base is a subset of the whole inscriptional corpus in many dimension: the focus on several grammatical morphemes creates an intersection and determines the amount of lexemes and their

[532] The lexical classes of numerals, prepositions, adverbs, and particles are therefore excluded. The incorporation of positionals is likewise very restricted with the exclusion of *–laj* ~ *–wan* as non-CVC suffixes.

frequency. Only few root morphemes outweigh the rest of the data base, they may even dominate a particular showcase or spelling scheme. The root *uk'* ranking first among the samples is a good example: it is abundantly attested with its instrumental derivation on ceramic vessels. Entailed by the showcases, only one lexeme with 100 or more samples is not a verb: ranking tenth, *te'* is again handed down on a large number of ceramics[533].

The observation that the sample corpus approximates a Zipfian curve and the assumption that the whole corpus would as well leads to an intriguing deduction: are such distributions recursive? Does any recurrent and random taking of samples in a large enough subset taken from a corpus reproduce an approximation, because it is scale invariant (being the inverse function of a Pareto distribution) and largely self-similar[534] to others similar to a fractal? The latter questions are currently under debate, but there are studies that indicate such an interrelation (Chen 2012a, b).

Assuming a correlation between suffix function and lexical class, the frequency of samples for a specific showcase can also be ranked (Figure 15b). The approximation to a Zipfian distribution is less clear than with the lexemes. Medium ranked suffixes are too high in number, while those ranked lower are too small in comparison. However, a ranking by just 16 different suffix forms provides a lesser significance than the distribution of 219 lexemes. The selection of the showcases also distorts the picture. Passive forms are highest in number, implying a general tendency to express actions in an impersonal style. Instrumentals and mediopassive forms on $–V_1y$, ranking second and third, are again influenced by the high number of dedication formulae on portable objects. The suffixes ranking lowest[535] are partly of limited productivity and may even represent vernacular forms, but were granted a comprehensive consideration among the showcases.

Nevertheless, the assumptions made in Chapter 2.5.2 regarding the probability distribution can be taken as granted. The results are significant for the lexemes. The addition of more grammatical morphemes would likely even the suffix distribution towards a Zipf curve.

The frequency of specific lexemes is also influenced by the content and rhetorics employed in the inscriptions that also depends on regional preference (called "regional genres" by Stuart [1995: 118-133). While we can assume certain topics to be widespread, others are more restricted. Likewise, while certain regions and sites may rather have a narrow historiography, others may record accounts of a broader thematic variety, exhibiting a broader lexical diversity.

As far as the orthographic conventions under the premises of this study are concerned, the broader the lexical diversity, the more significant are the statistical tests and the validity of the spelling

[533] Order of precedence: (1) *uk'* – 418, (2) *t'ab* – 262, (3) *k'al* – 248, (4) *kab-a* – 244, (5) *tz'ihb-a* – 200, (6) *sih* – 165, (7) *tz'ap* – 131, (8) *tzutz* – 127, (9) *it-a* – 119, (10) *te'* – 108, (11) *chuk* – 100. The ranking also is about the writing material and genre. Some roots are plentiful from ceramics, others clearly originate from a historical context and refer to events in the lifetime of individuals.

[534] With a varying degree of approximation depending on the range and cardinality of the subset, therefore statistically and not strictly self-similar. Furthermore, such a subset can never be infinite with a defined and restricted corpus.

[535] Order of precedence: (1) 1PASS – 1041, (2) 3INSTR – 516, (3) 2MED – 515, (4) 4TEMP – 464, (5) 2IND – 367, (6) 1INCH – 329, (7) 2ANTIP – 218, (8) 1ATTR – 202, (9) 1POSS – 141, (10) 3NMLS – 38, (11) 1ABSL – 22, (12) 1POS – 15, (13) 2 COM – 12, (14) 2INCH – 9, (15) 1MED – 3, (16) 2POS – 0.

schemes. A greater topical range with a homogenous and consistent way of writing supports the idea of a tendency towards a standardised orthography and holistic approach to graphematically deal with the requirements of the underlying language. This is true for both a spatial and a temporal perspective.

Based on the regional division made in Chapter 2.5.4, all samples pertaining to a showcase can be ordered by their overall lexeme frequency in a distribution chart (Figure 16). This visualisation highlights the overall amount of samples per region and allows to make three observations: (1) the weight of one region by its overall lexeme frequency, (2) the sample frequency per lexeme, and (3) the lexeme diversity. Regarding the first aspect, it is not surprising to find regions like Central Peten, Usumacinta or Motagua to feature more samples than regions like Quintana Roo or Hondo. While the rank is measured by the overall frequency, there is no gradual fading in each region, but a diverse pattern, indicating the regional preference for certain contents and rhetorics. For the third aspect, the lexeme diversity can generally be regarded as larger, the less interruptions are visible in the matrix.

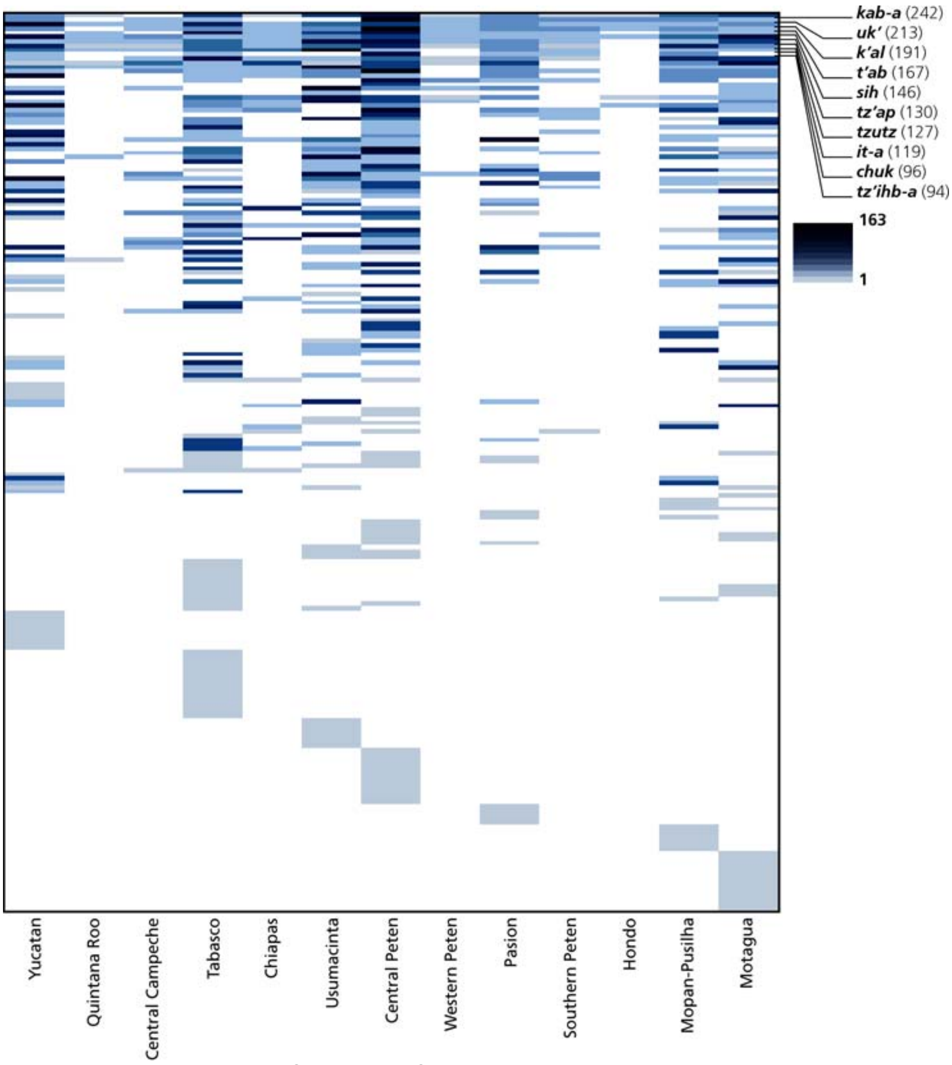


Figure 16: Heatmap of lexeme frequencies across geographic regions, ordered by cardinality, outlining the top ten ranks. Only samples attributable to a specific region are included with $N_{G(l)}$:=|3229| and N_R := |209|. Sven Gronemeyer.

In order to determine lexical diversity, the Shannon Index (Shannon 1948) can be utilised, almost unconsidered in linguistics so far (cf. Jarvis 2013: 93)[536] and despite some problems with the sample size. The index was originally developed to quantify text entropy and later used to determine biodiversity. If the number *N* for individuals is replaced by samples and *S* for species is replaced by lexemes, the index can also be used to determine lexical diversity:

$H' = -\sum_i p_i \cdot \ln p_i$ with $p_i = \frac{n_i}{N}$, where

n_i is the amount of samples belonging to one lexeme, and

p_i is the proportion of the respective lexeme *i* to the amount of *N*

The Shannon Index thus numbers the uncertainty to predict the lexeme of a sample randomly taken from the set. In other words: it describes the distance before the lexeme is repeated again in a text, but this measurement can also be abstracted for larger levels: texts from one site, a region or a time period. This means, the smaller H' is, the less predictable is a lexeme, because the lexical diversity is larger in relation to *N*. It is the advantage of the Shannon Index to consider both the amount of lexemes as well as their abundance among the entire set of samples. The index reaches its maximum when all lexemes follow a uniform distribution:

$H_{max} = \ln S$

The evenness J' describes how equal the samples are distributed among the lexemes:

$J' = \frac{H'}{H'_{\max}}$, with $0 > J' \leq 1$ and $J' = 1$ when $H_{max} = H'$.

This means that the smaller J' is, the more are certain lexemes dominating, evenness is therefore an important comparison for the lexical diversity. Regions with only a relative small amount of samples necessarily are supposed to feature a greater evenness with a more predictable lexical diversity.

This is not so much the result of genres and rhetorics, but owed to one major circumstances: lexeme diversity and evenness are more or less proportional to the Zipfian distribution, with a necessary noise from the ideal distribution. This relation was first proposed by Zipf (1937) and later confirmed by Carroll (1938: 379-380) who referred to it as the "diversity of vocabulary". Only secondly, other factors come into play, for example the source situation (see below). The results are summarised in Table 66.

The relation between lexeme diversity and evenness can best be demonstrated with the comparison of the Central Peten and Tabasco regions: both have 96 lexemes attested (not necessarily the same), but the amount of samples is more than double in Central Peten. The value for J' is therefore lower in the latter region, and similar to the total evenness, which supposedly also approximates a Zipfian distribution as the overall sample set illustrated in Figure 15a. With the comparable small number of lexemes, a randomly taken sample is much more likely to be one of the lexemes with high relative fre-

[536] Jarvis (2013) is the first to review the benefit of the index for quantitative linguistics. The quantification method described here was independently developed, with his article published the same time when the analyses of this chapter took place.

quency. The higher value for H' in Central Peten reflects this correlation, the lexical diversity is therefore higher in the Tabasco region (but also the evenness) and texts of this provenance are supposed to be more innovative in their content. Yucatan is also an interesting case, as it has a fair evenness, but also a rather low lexical diversity. This correlation might imply the restriction to certain topics in the texts. As expected, regions like Quintana Roo or Hondo provide a great evenness and a small lexical diversity[537].

Region	*H'*	*J'*	*S*	*N*
Yucatan	0.0309	0.8302	66	472
Quintana Roo	0.1010	0.9563	11	18
Central Campeche	0.0613	0.9032	22	56
Tabasco	0.0217	0.8389	96	431
Chiapas	0.0505	0.8963	28	104
Usumacinta	0.0311	0.8287	66	411
Central Peten	0.0314	0.7584	96	928
Western Peten	0.0770	0.9466	15	30
Pasion	0.0325	0.8999	45	189
Southern Peten	0.0630	0.8701	24	65
Hondo	0.1680	0.9167	7	15
Mopan-Pusilha	0.0329	0.8597	53	215
Motagua	0.0305	0.8137	73	306
Total	0.0163	0.7711	209	3229

Table 66: Lexeme diversity indices H' and J' for geographic regions with $N_{G(l)}$:=|3229| and N_R := |209|.

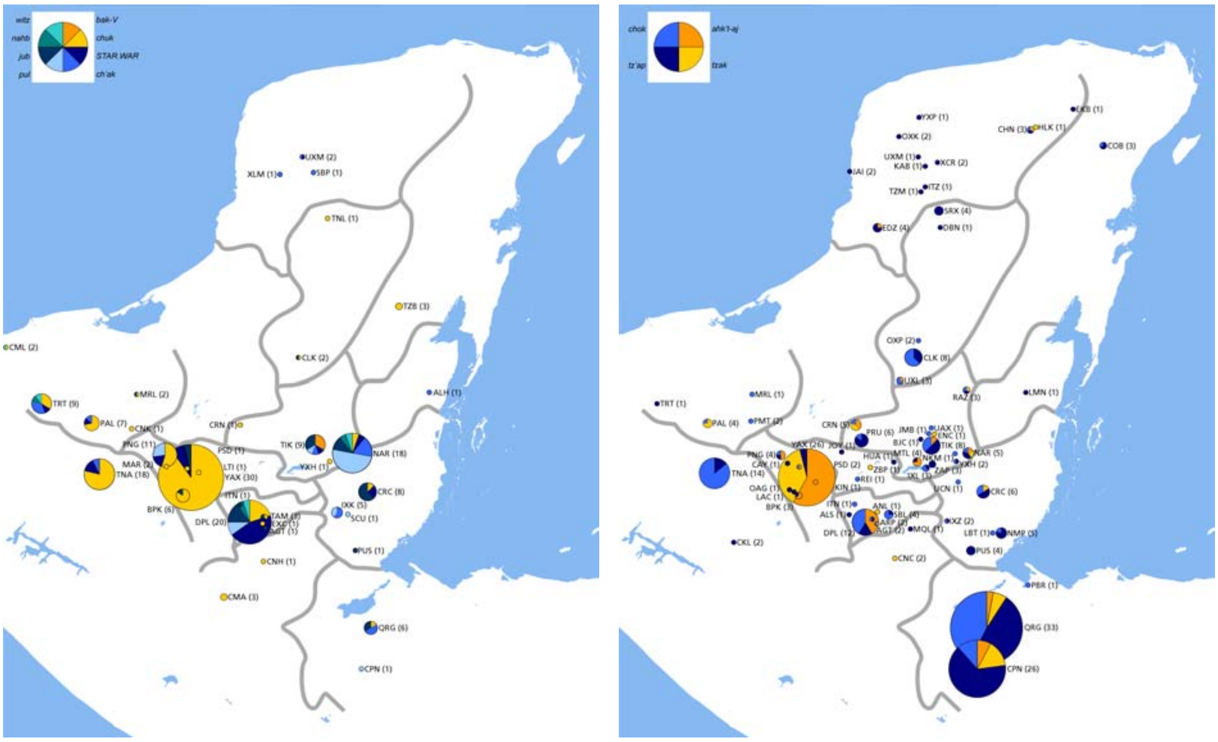
The investigation of lexeme diversity and distribution can be taken to a much more granular level, for example to individual sites. A distribution map of selected war-related expressions (Figure 17a) shows that they concentrate along a band from southern Tabasco along the Usumacinta, the Pasion and into the Central Lowlands[538]. In contrast, a selection of ritual actions[539] (Figure 17b) con-

[537] To demonstrate the relation to the Zipfian distribution, the samples from Quintana Roo and Hondo are provided by their lexeme frequency, also indicating their cardinality and rank for the overall lexeme frequency analysis conducted for Figure 16. Quintana Roo: *kab-a* (3, 242/1), *chuk* (3, 96/9), *sih* (2, 146/5), *tz'ap* (2, 130/6), *tzutz* (2, 127/7), *k'al* (1, 191/3), *it-a* (1, 119/8), *chok* (1, 78/12), *joy* (1, 57/14), *ahn* (1, 23/34), *jel* (1, 9/57). Hondo: *t'ab* (4, 167/4), *uk'* (4, 213/2), *kab-a* (2, 242/1), *tz'ap* (2, 130/6), *k'al* (1, 191/3), *k'a'* (1, 42/20), *ch'ak* (1, 33/22). As the two regions show, the samples exhibit a standard inventory of lexemes that usually rank rather high in terms of their overall frequency. In the set used for Figure 16, the top ten ranking root morphemes have an overall quantity of 1525 samples, i.e. only 4.8% of lexemes comprise 47.1% of samples attributable to a specific geographic region by known provenance or indirect evidence. The whole set used for Figure 16 represents 83.3% of all samples.

[538] Within these regions and especially among archaeological sites, there are clear preferences. Tonina and the Usumacinta sites emphasise the capture of individuals. Tortuguero as well as the Pasion and Central Lowland sites have a more diverse accounting of war actions, but not without particular characteristics. Dos Pilas features 'Star War' events quite prominent, while Naranjo does with *pul* actions against sites and Caracol texts focus on *jub*. Tikal is the only site to feature the derived verb *bak-a*.

[539] As with the war expressions, words that can be used in multiple contexts have generally not been included. An example for war action would be *hul* (in connection with the *entrada* [Martin and Grube 2000: 29]), for ritual events *k'al* not only is used among period ending ceremonies, but also for accession statements. However, as Houston (2000: 169) noted, conventional categories of historiography are an etic view applied to the Maya text tradition. Stuart (1995: 99-102) addresses the difficulties between the correlation of media and style and defines historical and genealogical information only secondary in contrast to dedication statements (Stuart 1995: 155)

veys a totally different picture. The distribution is more diverse and embraces far more sites. The two examples of rites in connection with period endings are most abundant, emphasising the reckoning of time as 'history'(Stuart 1995: 161-162)[540].



a b

Figure 17: Distribution and frequency of expressions among individual archaeological sites. **a)** Selected war-related events, **b)** Selected ritual events. Sven Gronemeyer.

Of course, the preference for recording specific events in one site or another is only related in a certain way to lexeme diversity (and indirectly the affixation patterns with these words). It is not yet proof for any preference in spelling practices, but a larger lexeme diversity makes their analysis more significant.

The number of samples and lexemes, specifically from a certain region, is also not only the result of genres. It is more conditioned by the source situation. The general scarcity of sites in the Western Peten region for example is due to two major circumstances: (1) only recently have planned excavations taken place in important centres like La Joyanca (e.g. Breuil-Martínez et al. 2000) or Zapote Bobal (e.g. Breuil-Martínez et al. 2005), (2) many monuments exposed on the surface are badly preserved

and this 'history' is embedded in a ritual context. Nevertheless, verbs that can also refer to stages in an individual's life or to changes in the social role or status – which are associated with ritual activities – are excluded.

540 This is especially true for Copan and Quirigua, where Stuart (1995: 119, 122) noted the abundance of dedication texts along a scarcity of dynastic or military records – visible in a comparison between Figures 17a and 17b. Yaxchilan is a special case not only in warfare, but also in recording dancing and conjuring events, but neglecting period endings. Dance (Grube 1992) also plays a significant role in other sites, such as Dos Pilas, La Corona, and again Copan and Quirigua.

and have repeatedly been burnt by *milperos* clearing their fields, such as in La Florida (Guido Krempel, personal communication, 2010) or Zapote Bobal (Fitzsimmons 2012: fn. 12).

Similar reasons also apply to other regions. The modest set of legible texts we have from Central Campeche, Quintana Roo and Hondo (which constitute a macro-area) and Southern Peten are the result of: (1) few sites with inscriptions known[541], (2) the survey of new sites is still an ongoing process[542], (3) although sites like Calakmul or Coba have a vast monumental corpus, the monuments are badly preserved because of poor limestone quality, and (4) even major sites in these regions, such as Becan, Rio Bec or Kohunlich remain with almost no (monumental) inscriptions.

A third relation generally also concerns the state of source materials with time depth, but also with lexeme frequency and diversity. Although the discovery of the San Bartolo murals (Saturno, Stuart and Beltrán 2006) places the emergence of Maya writing back into *Bak'tun* 7, texts from the Pre-Classic and Early Classic remain limited in number, as they do from the Post-Classic[543]. The number of texts is confined by multiple factors: (1) the development of the writing system and a writing tradition, (2) the amount of literacy, (3) the choice of writing materials, and (4) conservation issues, both cultural and natural[544].

Lexeme frequency is also only loosely related to the number of sources available, as a lexicon changes over time, as well as genres and rhetorics. The emic concept of historiography is also not only defined by Stuart's "regional genres", but also subject to temporal emphases. Different times might have found different things worthy to be commemorated, although a common sense for certain types of events is quite secure. Nevertheless, the same review regarding lexeme frequency and lexical diversity can be conducted from a temporal perspective.

[541] For example, Southern Peten has only Machaquila and Cancuen as major centres. The Motagua region is comparable, with Quirigua and Copan, but it has an incomparably larger corpus.

[542] This is especially true for Central Campeche, where only Calakmul and recently Uxul (e.g. Grube and Paap 2008) are subject to large archaeological projects. Reconnaissances in the area found many new sites (e.g. Šprajc 2008, 2009) and re-discovered others (e.g. Šprajc, Folan and González 2005). New inscriptions will contribute to the corpus with their proper documentation, such as the at least ten monuments in the recently discovered site of Chactun (Ivan Šprajc, personal communication, July 2012). The proper recording is also an issue for the site corpus of Calakmul which presently remains poorly published. Of the more than 100 stelae, only a part is available by field drawings with an even lesser share published.

[543] See the chart in Grube and Martin (2001: 3) that counts the number of events recorded for *K'atun* intervals. Although the chart does not correlate context and contemporary dates, it nevertheless provides an approximation.

[544] Also see footnote 99 for the problems of defining a hieroglyphic 'corpus' in the sense of corpus linguistics. A good case of comparison is Ancient Egyptian literature. Unlike cuneiform writing in Mesopotamia, Egyptian writing systems were designed to be used on a variety of materials, more or less perishable in different environments (contrast the desert with the Nile floodplains). As Tait (2003: 9-10) points out, the Egyptian source materials survive heterogeneously with respect to time and space, e.g. with the Nile delta almost being a 'white spot' through all times. Baines (1983: 590-591) in a somewhat problematic approach correlated literacy with the production of texts and sees a steady increase of text production into Greco-Roman times. The amount of published sources provides a slightly different impression. The majority of the texts presented in the *Urkunden* series (Steindorff 1904-35) comes from the New Kingdom, but this is also affected by the edition history of the series. Breasted (1906-07) only provides historical documents until the Persian annexation, but again the time before the New Kingdom is represented by far fewer texts. Still the question remains whether the gap between the number of earlier and later texts is ultimately a result of production or conservation – or even interrelated.

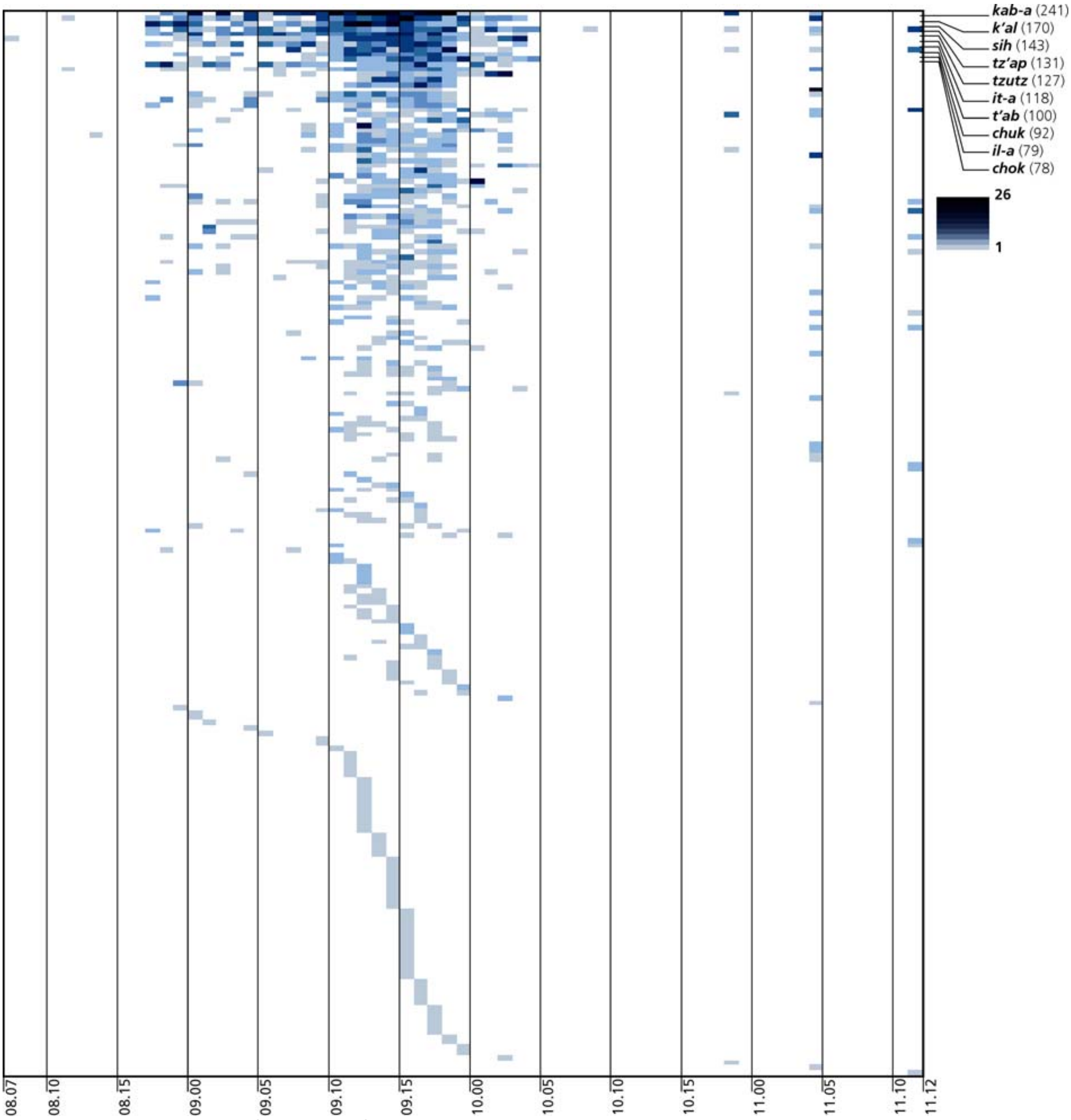


Figure 18: Heatmap of lexeme frequencies over time, ordered by cardinality and serialised by first occurrence, outlining the top ten ranks. Only samples datable to a specific *K'atun* interval are included with $N_{T(m)}$:= |2801| and N_R := |210|. Sven Gronemeyer.

When the ranked lexemes are serialised per *K'atun* interval, the runtime of each root morpheme can be connected with a frequency distribution (Figure 18). The chart demonstrates the relation already provided by the Zipfian distribution. There is a large number of lexemes with only few samples or even just one attestation that disperse among the showcases. But their quantity equalises the weight put in by the few high frequency roots[545] with their preferred affixations and spellings that preset the ductus of the texts. In the end, the result is expected to be rather homogenous, as far as the spelling schemes are concerned. The analyses are able to compare spelling practices between (1) a large number

[545] The top ten ranking root morphemes have an overall quantity of 1279 samples, i.e. only 4.8% of lexemes comprise 45.7% of samples datable to a specific *K'atun* interval by a contemporary date or indirect evidence. The whole set used for Figure 18 represents 72% of all samples.

of a few frequent lexemes with a suspected highly standardised orthography with (2) a broad variety of roots with a low number of samples and scarce attestation that either follow an orthographic standard or are subject to the preferences of an individual scribe.

The seriation of the lexemes fulfils a double function in relation to the runtime. A comparison of individual time spans can provide answers about the relevance of an information in historiography. The temporal clustering of the totality of lexemes implies a limited correlation whether the amount of source materials is subject to production or conservation.

Leaving the codices[546] and some outliers apart, two significant date ranges can be identified: (1) the height of text production[547], when measured by quantity and diversity, between 9.12.0.0.0 and 9.18.19.17.19 and (2) the gross of affigated writing between 8.17.0.0.0 and 10.4.19.17.19 that reflects natural language[548]. The quantity of spellings and the lexical diversity for each *K'atun* interval also helps to define which ones are relevant and significant for spelling scheme analyses on a diachronic basis (Chapter 3.3.5). As with the spatial investigation, we can investigate the lexical diversity and evenness for each *K'atun* interval (Table 67).

The figures for lexeme diversity and evenness over time demonstrate again that low frequencies once more result in a greater evenness and lower diversity. Even more than the figures for the geographic regions, the temporal development shows some interesting developments. These are already visible in the frequency distribution of Figure 18, but the indices from Table 67 are moreover to quantify them. In the range from 8.17 until 9.8, the lexeme frequency is rather even, exhibiting only a fairly low diversity. However, 8.19 and 9.0 stand out with a notable lower evenness and especially 9.0 with a

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[546] The three columns with samples from them remain temporally isolated. The low number of screenfold books available today is largely the result of the cultural conservation factor – or rather the lack of. Landa (1959: 105) mentions the "[…] gran número de libros de estas sus letras […], se los quemamos todos, […]." After the 1562 Mani *auto de fe*, Colonial documents prove the ongoing production and use of codices in Colonial times and biblioclastic actions by ecclesiastical authorities in many places of Yucatan, with more than 20 cases attested (cf. Chuchiak 2004, 2006).

[547] In the given period, there is a clear cut before the start of the 19th *K'atun* which coincides with the collapse and the beginning of the Terminal Classic in 810 AD. The anterior border is somewhat fuzzier, showing a steady increase from around 9.10 on, but again with a more significant border with the 12th K'atun in 672 AD well within the Late Classic. These seven *K'atun* intervals represent 10.8% of the entire range where securely datable samples have been found, but contain 1785 or 63.7% of the entire set of 2801 samples.

[548] Presuming that the writing system was fully developed in the Late Classic, an increase in lexemes, their frequency and diversity, is the reflection of increased text production. It is however not true for the broader sample range. A precise dating is barely possible for Late Pre-Classic and Early Classic texts, where mostly palaeographic arguments for a relative dating (cf. Mora-Marín 2001: 163-168) apply. The first secure Long Count date is 8.12.14.8.15 or 292 AD on TIK St. 29. It more or less coincides with the beginning of the Early Classic. The 'Early Classic explosion' attested by the samples only appears late from 376 AD on. It is also not just a matter of the showcase selection or that writing at all suddenly applies affixation in writing, Early Classic samples without a secure date are simply not considered in the heatmap. The reasons for the ceasing of showcase spellings in 928 AD close to the beginning of the Post-Classic are different. Notable is a remarkable decline or even stop of *kab-a*, *sih*, and *chuk* among the top ten ranking verbs and many other lexemes connected to socio-political activities in the broader sense after 9.18. An exception is *it-a*, which continues in texts from Yucatan and even peaks in frequency there. Verbs of 'ritual' or 'dedicatory' function like *k'al*, *tz'ap*, *il-a* and *chok* persist in the record, showing a shift in the historiographic focus. An exception from the top ten ranks is *tzutz*, with a sudden drop in use after 10.1. Writing also did not completely vanish. Graña-Behrens (2002: 458) lists 23 datable texts from northwestern Yucatan from 10.5 on, the last is MPN St. 6 celebrating 11.3.0.0.0 in 1283 AD. The Post-Classic 'showcase gap' is yet another result of shifting historiography: it became less important to record dedication ceremonies and period ending rites, the reckoning of time became sufficient to write history.

larger diversity[549]. Between 9.9 and 9.11, we can observe a steady increase in lexical diversity with a general decrease in evenness. The range from 9.12 to 9.17 shows a considerable low evenness with a high lexical diversity, most notably the intervals of 9.12 and 9.15. Shortly before the Late Classic collapse, 9.18 shows a decreasing diversity, while the evenness stays rather low. With the collapse in 9.19, lexical diversity decreases even more, with a more even frequency[550]. In the Early Post-Classic between 10.0 and 10.4, the lexical diversity decreases again, with fluctuations among the evenness[551]. For the three last intervals assigned to the three codices, the impression is inconsistent and certainly owed to the structure of the almanachs and their contents[552].

As the introductory analyses show, mere figures do not necessarily provide a substantial validity. A concentration on the raw data leaves many interpretational pitfalls, and one should not trust any statistics not made up by illuminating the backgrounds. A final remark on this imperative concerns the significance of lexeme frequency. It was already mentioned that frequent roots like *uk'* and *t'ab* originate in the abundance of dedicatory phrases on portable objects. Another case concerns *kab-a*, which ranks first in the frequency distribution of Figure 17. The explanation is less socio-politic to indicate that an event took place under the auspices of an overlord (Grube and Martin 1998: 133-134), but rather by the preferred argument structure. It re-introduces the agent that was eliminated by the intransitivation of the main verb, as Riese was first able to demonstrate (Baudez and Riese 1990: 114-115).

549 For the 9.0, the high lexical diversity is mostly triggered by TIK St. 31 erected in this *K'atun* interval. Its lengthy account contributes 32 samples (53.3%) alone.

550 A review of lexemes and their frequency reveals that there is a fairly even proportion between dynastic and socio-political events, warfare, and period ending rites.

551 Especially 10.0 and 10.2 show a fairly low evenness. For 10.0, we can make out a high number of *mak* events on capstones that comprise 21.9% of the samples to this K'atun interval. For 10.2, the many texts from Chichen Itza distribute 63 samples (70.8%) between the four lexemes *k'uh*, *uxul*, *it-a* and *k'al*.

552 10.18 associated with the Paris Codex has a very low diversity, with a fairly even overall frequency. The Dresden Codex in 11.4 has both a fairly low lexical diversity and evenness. This implies that its almanachs and astronomical chapters have a rather restricted thematic range. Above all, these are expressed by only a few, but highly repetitive, formulaic expressions: the three lexemes *ch'ab*, *k'al*, and *pek* comprise 85 of all codical samples (48.9%) alone.

K'atun Interval	H'	J'	S	N
08.07	1.0000	1.0000	1	1
08.11	1.0000	1.0000	2	2
08.13	1.0000	1.0000	1	1
08.17	0.1103	0.9575	10	13
08.18	0.1043	0.9426	11	19
08.19	0.1040	0.8823	13	31
09.00	0.0604	0.9079	22	60
09.01	0.1394	0.9475	8	14
09.02	0.0704	0.9570	16	23
09.03	0.1245	0.9484	9	15
09.04	0.0789	0.9622	14	22
09.05	0.1061	0.9741	10	14
09.06	0.1200	0.9208	10	18
09.07	0.0917	0.9614	12	20
09.08	0.0737	0.9404	16	30
09.09	0.0577	0.9230	22	43
09.10	0.0496	0.8594	33	85
09.11	0.0273	0.9070	53	123
09.12	0.0216	0.8707	82	300
09.13	0.0292	0.8634	60	219
09.14	0.0224	0.8771	76	251
09.15	0.0218	0.8761	79	275
09.16	0.0242	0.8846	67	305
09.17	0.0233	0.8817	71	271
09.18	0.0324	0.8809	49	164
09.19	0.0482	0.9534	24	44
10.00	0.0718	0.7904	28	32
10.01	0.0985	0.9034	13	32
10.02	0.1021	0.7750	19	89
10.03	0.1257	0.8650	11	25
10.04	0.3482	0.9602	3	5
10.08	1.0000	1.0000	1	1
10.18	0.2024	0.8211	7	16
11.04	0.0681	0.8346	25	174
11.11	0.0915	0.7526	24	64
Total	0.0155	0.7394	210	2801

Table 67: Lexeme diversity indices H' and J' for *K'atun* intervals with $N_{G(I)} := |2801|$ and $N_R := |210|$.

3.3.3 – Analyses by Showcase Groups

The introductory showcase analysis examines all showcases combined to retrieve a first assessment (Figure 19) regarding an overall spelling group significance. This analysis serves as a back reference from the individual showcase group analyses. Several other parameters are also investigated to prepare the ground to interpret all subsequent analyses. As the other analyses within this chapter, it focuses on the spelling schemes alone and is without any spatial or temporal dimension.

Testing the assumption that it was a scribe's preferred choice to use vowel-providing spellings delivers: $n_1 = 1925$ and $k = 2076$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified. The overall amount of spelling group 1 samples is not significant enough.

A high number of 2.e.i and 2.e.ii schemes with spelling group 2 with a predictable suffix vowel is evident, therefore H_0 and H_1 are set up to test the assumption that overall 'economic' spellings of the form **CVC=CV** were used. The result is $n_2 = 1866$ and $k = 1246$ with $p \approx 0.3$ and $\alpha = 0.99$. As $n_2 \geq k$, H_1 is proven true. Even if only 2.e.i and 2.e.ii schemes alone would be considered with $n_2 = 1258$, the test would still provide the same significant result.

As H_1 for spelling group 2 is accepted, it also means that spelling group 1 H_0 is true. Although full phonemic spellings, which require one syllabogram more to be written than group 2, are not preferred, the writing system is nevertheless quite unequivocal. Spelling group 2 schemes underspell the suffix vowel, but its pronunciation can be predicted by the linguistic premises. To what extent then the choice of the syllabogram for the suffix contributes (1) to the suffix vowel by a harmonic spelling and (2) to the suffix function by regularly applying a specific grapheme has already been noted in Chapter 3.1. The predictions of representative spellings can now be tested against the epigraphic evidence.

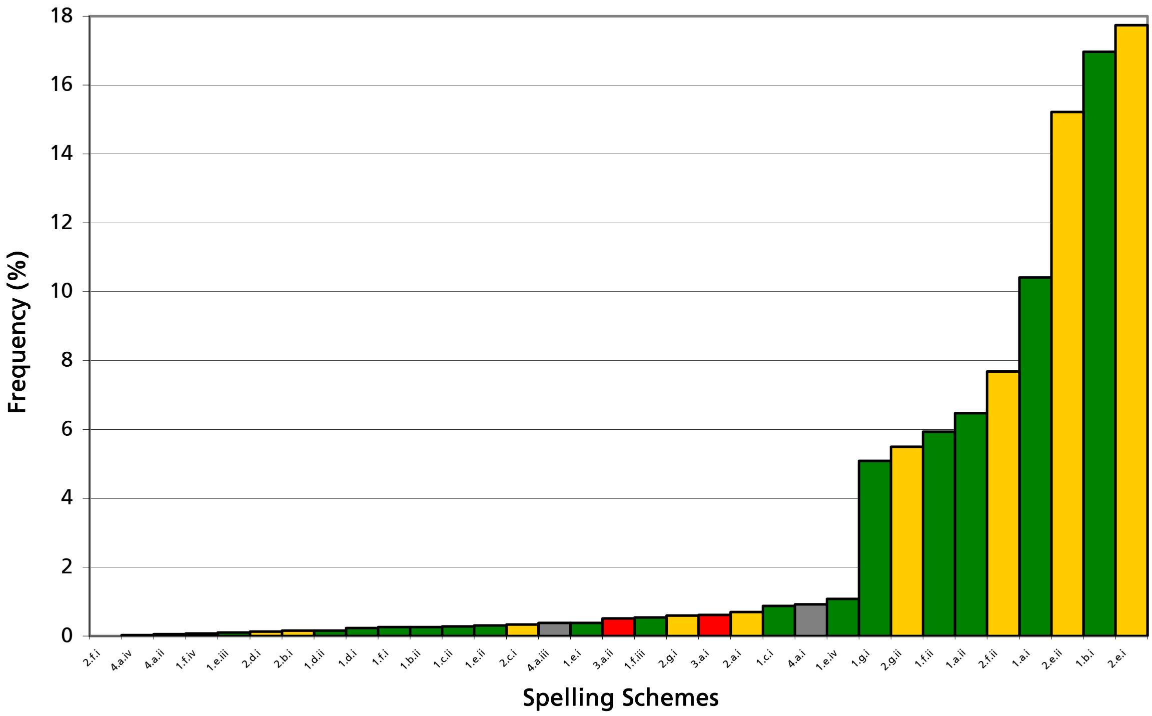

Figure 19: Relative frequency of spelling schemes for all showcase groups with N_S :=|3890|. Sven Gronemeyer.

Variations between the different showcases and within between different functions are expected and may very well result in a heterogeneous pattern, i.e. certain suffixes may show a preference for one of the three spellings groups. When comparing the relative frequency of spelling schemes, unified by their spelling group attribution (Figure 20), considerable discrepancies can be made out. Their discussion and significance is part of the individual analyses to follow. To shed some initial light from different angles on the parameters that govern spelling practices may help to better interpret the orthographic paradigms for each showcase.

When comparing the overall frequency of (complemented) morphographic roots with the quantity of spelling groups 1 and 2, one can observe a close correlation. For all showcases, morphographic roots mark a total of 57.3% altogether, even when complemented (with only 21.4% of group 1 spellings using a morphograph, but 93.7% of group 2). To what extent this relationship is tied to the significance of a spelling group is investigated by the individual analyses.

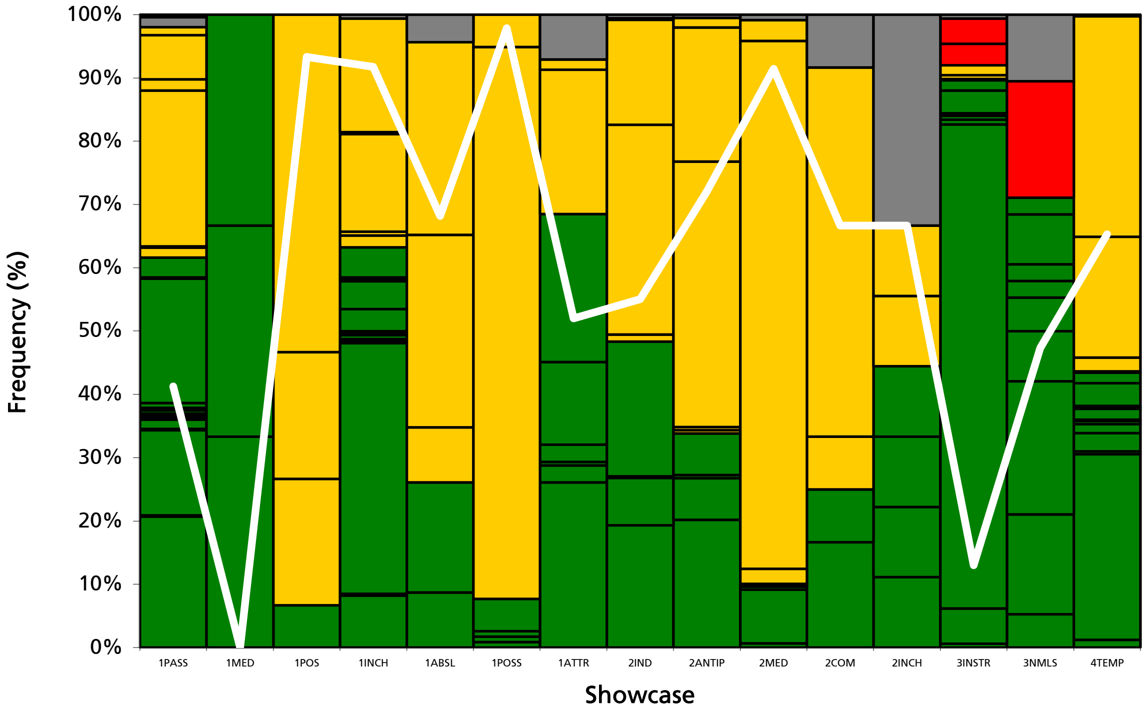

Figure 20: Relative frequency of spelling schemes across analytical showcases with N_S :=|3890|, summarised by spelling groups (1: green, 2: yellow, 3: red , 4: grey) and indicating the overall root morphograph frequency (white line). Sven Gronemeyer.

When arranging the spelling schemes per showcase in a frequency distribution chart (Figure 21), the assumption of a heterogeneous distribution of samples almost like an individual fingerprint is strengthened. However, some schemes are common across almost all showcases. Scheme 1.b.i counts 660 samples (17.0%), demonstrating a common practice of spelling alterations to achieve vowel-integration at morphemic boundaries. This trend of integration is also continued with schemes 1.a.i and 1.a.ii, counting 656 samples together. As these three schemes are based on a synharmonic root spelling, it is also evidence that these play a major role among lexical roots. Pure morphographic spellings of patterns 2.e.i and 2.eii count 1277 samples (32.8%) together. Some positions in the matrix necessarily need to be void, e.g. spelling group 3 cases designed for the instrumental and nominaliser suffixes cannot appear with any other showcase.

Spellings for the *–aj* passive thematic suffix exhibit the broadest variety, reflected also with the *–aj* inchoative. The other cases of test group 1 do not follow these preferences, moreover, control group 1 features a totally different pattern. The showcases appear quite heterogeneous with peculiarities inherent to each showcase, to be discussed in the following chapters. This also demonstrates that suffixes of parallel morphophonemics, which led to the definition of the test and control groups, do not necessarily need to follow a similar orthography. There are some general patterns observable accountable to most showcases: (1) a strong preference for pure morphographic root spellings, (2) a preference of unaltered synharmonic root spellings, (3) a lesser preference to underspell the suffix syllabogram, and (4) a tendency to alter synharmonic root spellings.

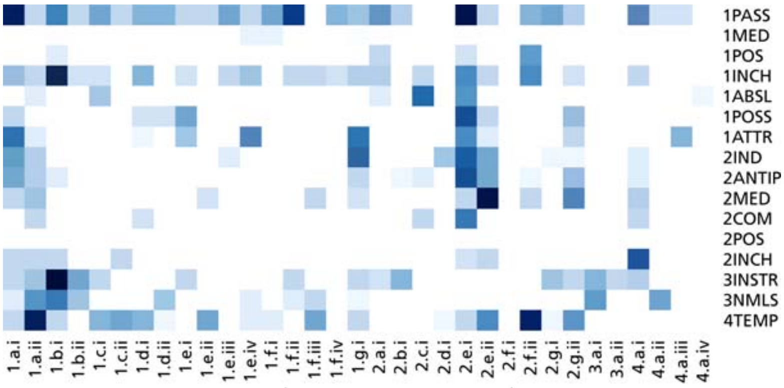

Figure 21: Heatmap of spelling scheme frequencies across the showcases, with N_S := |3890|. Sven Gronemeyer.

Another observation to note is the relative consistency of harmony rules for the suffix syllabogram. For example, one can observe a general predominance of #.#.i spellings among the passive and inchoative with *–aj* and the *–Vb* instrumental, while #.#.ii spellings govern the *–*V_1y mediopassive, the *–Vl* nominaliser and the *–Vj* perfect. This is indication of preferred spelling patterns. It is up to the analyses to empirically work out these patterns and possibly find support for the assumption of visual reading aids to indicate a suffix function.

When the distribution of spelling schemes per showcase is compared with the distribution of lexemes (Figure 22), there is not necessarily a correlation. Passive forms with a great variety of spelling schemes, especially among group 1, do indeed ground on a broad lexical range. Transitive forms appear with a much more limited set of spelling schemes, but a similar lexical range. Only some showcases with a low amount of samples like positionals on *–aj* or *–Vy* are sparsely populated along the lexical range. Also, relatively few lexemes appear with two or more showcases, mainly transitive verbs with a theoretic span of 1PASS, 1MED, 2IND, 2ANTIP, 2MED, 3INSTR, 3NMLS, and 4TEMP. But even here, certain verbs have preferences owed to rhetorics (see Chapter 4.1.12 for a showcase).

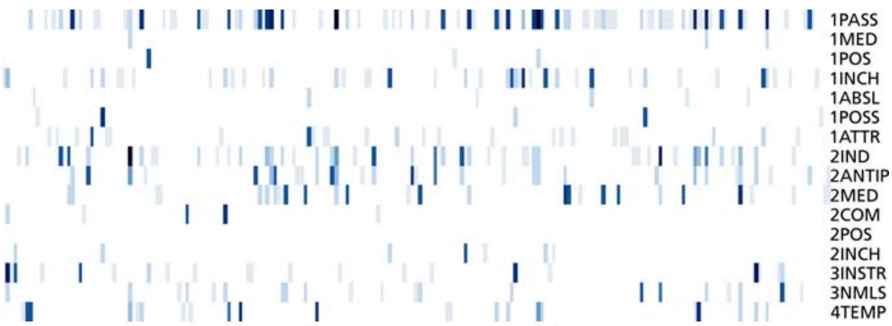

Figure 22: Heatmap of spelling scheme frequencies across lexemes, with N_S := |3890| and N_R := |217|. Sven Gronemeyer.

The distribution of lexemes per showcase shown in Figure 22 can also be quantified by their lexeme diversity and evenness indices (Table 68). There is again a close relation between the sample amount and the number of lexemes visible, generally resulting in a larger evenness, with the exception of 1POS which is largely dominated by one lexeme.

Showcase	*H'*	*J'*	*S*	*N*
1PASS	0.0492	0.6874	80	1041
1MED	0.3333	1.0000	3	3
1POS	0.5338	0.5714	3	15
1INCH	0.1414	0.5267	41	284
1ABSL	0.2343	0.8098	6	22
1POSS	0.4743	0.4635	5	141
1ATTR	0.1128	0.6779	25	200
2IND	0.0505	0.7797	47	368
2ANTIP	0.0734	0.7605	31	219
2MED	0.1525	0.5707	27	514
2COM	0.2407	0.8849	5	12
2INCH	0.1602	0.9410	7	9
3INSTR	0.4011	0.3049	20	516
3NMLS	0.0562	0.9455	21	38
4TEMP	0.1994	0.5216	22	463
Total	0.0187	0.7399	217	3890

Table 68: Lexeme diversity indices H' and J' for analytical showcases with N_S :=|3890| and N_R := |217|.

The figures provide some interesting details regarding rhetorics and a preferred discourse structure. Showcase 1PASS shows the most accentuated lexical diversity, at the time also considerably low evenness. The majority of passivised verbs are therefore low in frequency, with only a few lexemes for very frequent words. Similar, but less distinct is the correlation for 2IND and 2ANTIP. The cases of 1POSS, 2MED, 3INSTR, and 4TEMP show a very limited lexical diversity and a heavy unevenness and concentration to even fewer lexemes. In this respect, perfect forms are intriguing. Chapter 3.3.2 already indicated that *kab-a* is often used in secondary statements, but that otherwise the rhetorics limit the number of expressions.

In the end, the proportionality between spelling the scheme variability and morphograph frequency of a showcase is much more pronounced, but only ostensible. Compare 1PASS and 2IND with a similar lexical diversity, but an amount of 41.3% morphographs for 1PASS and 55.0% for 2IND. In absolute figures however, 33 more lexemes are attested as a passive form. The question remains for how many lexemes in either one of the showcases morphographs were developed[553] (and how the rate of usage is in the intersection of those lexemes used for both showcases). The individual analyses pursue these relationship questions in more details and are again summarised in Chapter 3.4.

[553] For the 80 lexemes of 1PASS, 36 morphographs are securely deciphered or at least applicable (when used as a phonemic sign in ‘rebus’ writing); for the 47 lexemes of 2IND, these are 22 morphographs in question. There is no large discrepancy in the proportion between the two showcases, so the simple existence of a morphograph does not allow conclusions about its use in the script.

3.3.3.1 – Test Group 1

Test group 1 will establish the analyses for the *–aj* suffix which serves as the role model for a suffix with a fixed vowel (Figure 23). It comprises four different suffix functions. These will be reviewed to examine the patterns of supposed constant suffixation and the interaction of =**jV** signs with suffixes following. In case there are well-defined patterns for the spellings schemes, the results are taken to make predications for the configuration of control group 1. The analyses of the two showcases pertaining to this group will be tested against the original test group.

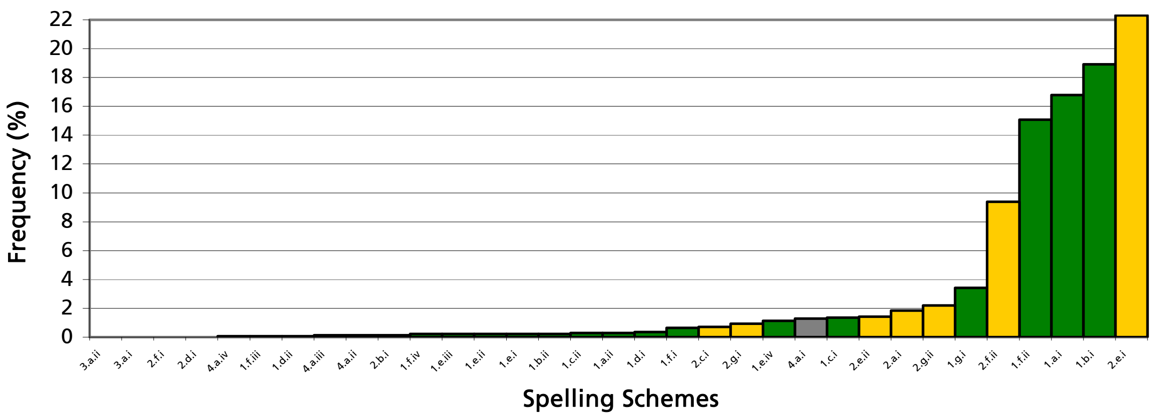

Figure 23: Relative frequency of spelling schemes for test group 1 with $N_{F(1)}$:=|1407|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 837$ and $k = 769$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true, but H_0 is not falsified. The test for spelling group 2 delivers: $n_2 = 548$ and $k = 467$ with $p \approx 0.30$ and $\alpha = 0.99$, hence $n_2 \geq k$ as well. Still, spelling group 1 provides a higher significance.

Not surprisingly, scheme 2.e.i is the single most frequent spelling variant with 314 samples (22.3%), where a suffix vowel harmonic =**ja** / __# < *–[a]j* is directly attached to a morphographic root spelling. Among group 1 spellings, schemes 1.b.i and 1.a.i are most prominent with 502 samples together (35.7%), i.e. we have **Ca=ja** / __# < *–aj*. The *–aj* suffix is therefore used with a number of CaC roots and regularly, the spellings of other CVC roots are altered. A significant amount of suffixes also occurs in a secondary position as scheme 1.f.ii, following another morpheme with =**Ca**=**ja** / … < *–aj*; or as scheme 2.f.i, it is syncopated after the root while it is followed by another suffix with any =**jV** sign.

Overall, test group 1 appears rather homogenous. More detailed reviews and analyses are provided among the individual showcases.

3.3.3.1.1 – Passive Thematic *–aj* ~ *–C-aj* ~ *–j* and Mediopassive Suffix *–C-aj*

Although sampled by two different showcase codes, the otherwise unrepresentative three samples of *–C-aj* mediopassives are analysed together with the passive as the thematic suffix is the same (Figure 24).

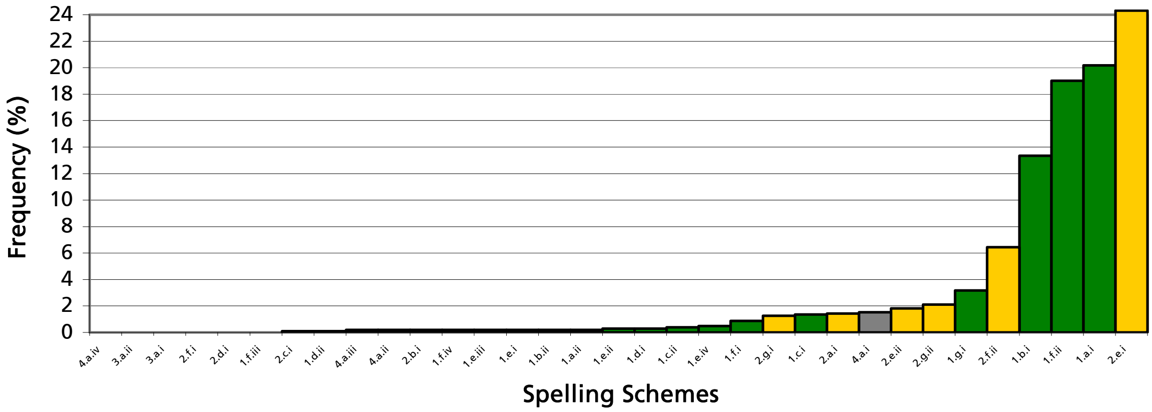

Figure 24: Relative frequency of spelling schemes for test groups 1PASS and 1MED with $N_{F(1PASS,\,1MED)}$:=|1041|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 629$ and $k = 575$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true, but H_0 is not falsified. The test for spelling group 2 delivers: $n_2 = 392$ and $k = 351$ with $p \approx 0.30$ and $\alpha = 0.99$, hence $n_2 \geq k$ as well. Still, spelling group 1 provides a higher significance than group 2.

The diatheses of transitive verbs applying the *–aj* thematic suffix are preferred to be written out, either by a pure syllabic spelling or by phonemic complementation to a morphographic root (accounting to only 15.3%). A majority of 349 samples (33.5%) comprises schemes 1.a.i and 1.b.i, the thematic suffix is therefore written either with a CaC or an altered synharmonic CVC root spelling with **Ca=ja** / __# < *–aj*. With 209 samples, CaC roots are far more often written (also see Chapter 3.3.6.3). Less frequent are disharmonically spelled roots as 1.c.i and 1.d.i schemes with 17 samples only (1.6%) that also provide **Ca=ja** / __# < *–aj*. Only 11 cases among spelling group 1 have **Ca=ji** / __# < *–aj*. In 33 cases (3.2%), the suffix is underspelled as a 1.g.i scheme with **Ca=Ø** / __# < *–a[j]*, possibly reflecting a sound change (see Chapter 3.3.6.2). Among a total of 209 samples (20.0%) , *–aj* is not directly following the root (applying the <*h*> infix), but one of the *–C* passive or mediopassive suffixes. This includes 198 cases of 1.f.ii with =**Ca=ja** / __# < *–C-aj* (mostly **tz'i-bV=na=ja**), 9 cases of 1.f.i with =**Ca=Ø** / __# < *–C-a[j]* and 2 cases of 1.f.iv with =**CVC** < *–C-aj*.

An amount of 272 roots (26.1%) is simply written by a morphograph, resulting in schemes 2.e.i. and 2.e.ii, with only 19 cases for the latter. 16 of them have =**ji** / __# < *–[a]j* (14 with *il-a*), =**ji** / … only occurs with 2 samples. There is a set of 67 spellings (6.4%) from scheme 2.f.ii, where the thematic suffix is syncopated and the vowel is not pronounced. In 53 cases, the thematic is followed by the temporal deictic enclitic *=iy*, 11 feature the future marker *–om*. In 22 cases (2.1%) of scheme 2.g.ii, the thematic is underspelled by =**Ø** < *–[aj]*. 20 cases among spelling group 4 are left for discussion, some of which are not only problematic in terms of their spelling, but which are only tentatively taken as passive forms.

Overall, it is evident that the amount of passive forms biases to a large extent the distribution of spellings among test group 1 (marking 73.3%). Suffixes in a position not directly following the stem are expected to be spelled by syllabograms providing the vowel, hence the significant amount of *–C-aj* forms also supports H_1 of spelling group 1 to be true. Furthermore, the constant use of a suffix vowel harmonic =**ja** / __# is testified. Only 27 examples of spelling groups 1 and 2 combined show =**ji** / __#.

3.3.3.1.2 – Intransitive Positional Marker *–aj ~ –j*

The amount of samples for the intransitive positional is ideally too low for a statistical test. Nevertheless, the samples provide a clear situation (Figure 25). More of interest is the temporal or spatial distribution of this suffix (see Chapter 4.1.2).

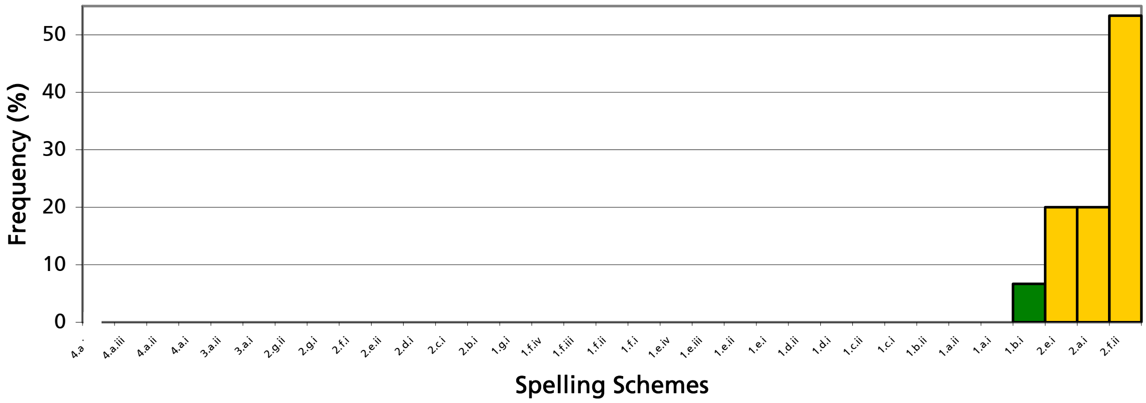

Figure 25: Relative frequency of spelling schemes for test group 1POS with $N_{F(1POS)}$:=|15|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 1$ and $k = 12$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 14$ and $k = 9$ with $p \approx 0.30$ and $\alpha = 0.99$.

The lexical range is very limited. In 12 out of 15 samples for this showcase, the root is written with a morphograph (**CHUM** ~ **CHUM**[mu]) for which no full syllabic substitution is known.

3.3.3.1.3 – Inchoative Suffix *–aj ~ –Vj ~ –j*

The inchoative comprises the second extensive function of *–aj* in the corpus, although the amount is considerably less in comparison with the passive (Figure 26).

The test for spelling group 1 delivers: $n_1 = 201$ and $k = 192$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true, but H_0 is not falsified. The test for spelling group 2 delivers: $n_2 = 128$ and $k = 120$ with $p \approx 0.30$ and $\alpha = 0.99$, hence $n_2 \geq k$ as well. Still, spelling group 1 provides a higher significance.

The distribution of spelling schemes is biased by a number of factors that overall pushes the significance of group 1 spellings. Even for this group, the amount of morphographs is abnormally high with 91.1%. It can be explained by the majority of **SIH**[ya]=**ja** spellings among scheme 1.b.i[554]. However,

[554] The figures are $N_{F(1INCH)}$:= |329| and N_R := |39|. For the lexical diversity, we would obtain $\mu \approx 8.4$ and $D_i \approx 26.5$. The number of 163 samples for *sih* is therefore an extreme outlier. Of the same reason, the spelling

cases of **SIH** also account for a majority of 2.e.i and 2.f.ii cases[555]. In sum, one root is responsible for 49.9% of the samples.

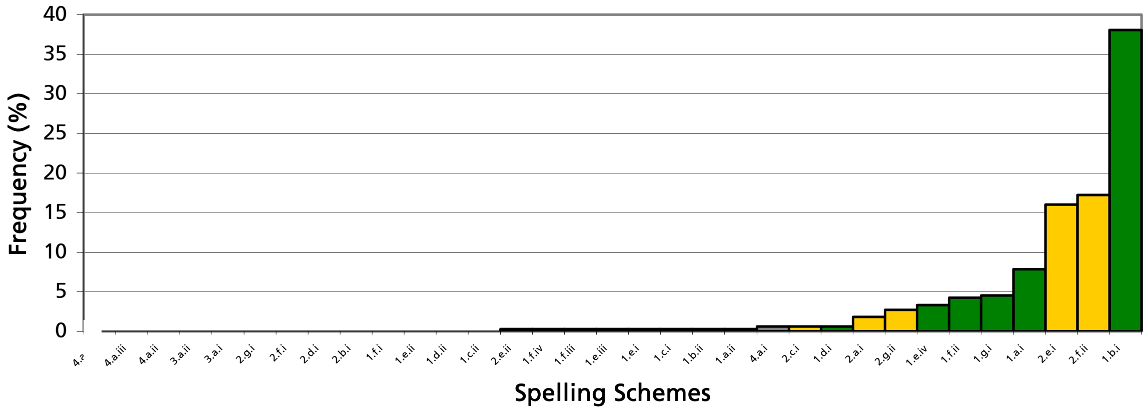

Figure 26: Relative frequency of spelling schemes for test group 1INCH with $N_{F(1INCH)}$:=|331|. Sven Gronemeyer.

A majority of 152 samples (46.2%) comprises schemes 1.a.i and 1.b.i, the thematic suffix is therefore written either with a CaC or an altered synharmonic CVC root spelling with **Ca**=**ja** / __# < *–aj*. Disharmonically spelled roots as 1.c.i and 1.d.i schemes only have 3 samples (0.9%) that also provide **Ca**=**ja** / __# < *–aj*. In 15 cases (4.6%), the suffix follows the 1.g.i scheme with **Ca**=**Ø** / __# < *–a[j]*, possibly reflecting the same sound change as with the passive (see Chapter 3.3.6.2). Possible vernacular inchoatives of schemes 1.f.ii and 1.f.iii on =**Ca**=**ja** / __# < *–C-aj* only comprise 11 samples.

In 54 cases (16.3%), the inchoative suffix is directly attached to a morphographic root, all except one being of scheme 2.e.i with =**ja** / __# < *–[a]j*. Syncopated suffixes adhering to scheme 2.f.ii comprise 57 cases (17.3%) that can be divided into two groups: =**ji** / __i (all of these involve the temporal deictic enclitic *=iy* to follow) and =**ja** / __a (all involve an *–al* adjectiviser). Only 9 cases (2.7%) underspell with =**Ø** < *–[aj]* as a 2.g.ii case. A group of 8 samples is specified as group 2 cases with **CV**=**ja** < *–[a]j*, but some could be re-classified to group 1 when assuming *–Vj* forms.

Despite the showcase bias by *sih*, it is evident that overall the inchoative favours a constant suffixation by =**ja** / __# with a total of 220 samples (67.3%) indicate a suffix vowel harmonic spelling by **Ca**=**ja** / __# < *–aj*. In fact, there is only one instance of =**ji** / __#.

3.3.3.1.4 – Absolutive Noun Marker *–aj*

The amount of absolutive noun samples is ideally too low for a statistical test. The showcase also shows little lexical range. Nevertheless, a clear picture is provided (Figure 27).

---

group 1 mean and standard deviation is 11.8 ±29.4. When bringing 1.b.i to the minimum deviation, 97 samples remain. Under these circumstances, $n_1 = 172$ and $k = 174$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 > k$, H_1 is falsified and H_0 proven true.

[555] Especially the **SIH**=**ja** spellings require a discussion. The frequent affixation with **ya** may indicate a sound change upon derivation, The 1.b.i spellings may be taken to provide a phonemic indicator. This possibility is further explored in footnote 672.

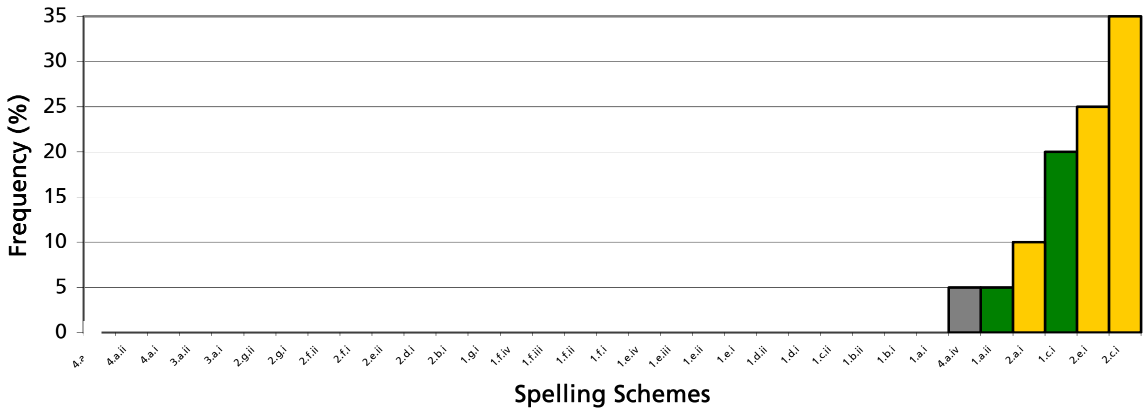

Figure 27: Relative frequency of spelling schemes for test group 1ABSL with $N_{F(1ABSL)}$:=|20|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 5$ and $k = 15$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group delivers: $n_2 = 14$ and $k = 11$ with $p \approx 0.30$ and $\alpha = 0.99$.

Disharmonically complemented 2.c.i schemes comprise 7 samples (35.0%), in fact 53.8% of all 2.c.i spelling schemes samples adhere to this showcase, because of **BAH**$^{\mathbf{hi}}$**=ja** and **NAH**$^{\mathbf{hi}}$**=ja** expressions. Pure morphographic spellings comprise 5 cases. Unaltered disharmonic roots of scheme 1.c.i comprise 4 cases (20.0%).

In 95.0% of the samples =**ja** / __# is used to indicate the suffix *–[a]j*, and spelling group 1 for a full phonemic rendition **Ca=ja** / __# < *–aj* marks 25.0%. Only one sample marks with **Ca=ji** / __#, hence there is good evidence for a constant and synharmonic suffixation pattern.

3.3.3.2 – Control Group 1

Test group 1 provides a statistical significance for both spelling groups 1 and 2 and no showcase is significant enough for spelling group 1 alone. The individual statistic analyses for each showcase have revealed that the patterns may depend from (1) the suffix function and (2) lexeme diversity. As the latter is rather restricted for case 1POSS, it can be expected that spelling group 2 is more significant. More lexemes are accountable for case 1ATTR, thus spelling group is preferable. Overall, control group 1 results only rely on the cardinality of each showcase sample set (Figure 28).

It must be noted that showcase 1ATTR is compromised by the fact that no *–el* ~ *–*V_1*l* suffix is sampled in the data base and no CeC root is reported in an attributive function[556]. Instead of having an empty showcase, samples with other *–*V_1*l* suffixes have been collected. This does not only suggest how the *–el* allomorph could be spelled. As the suffix vowel is variable, but predictable, the observations can also be used for comparison with test and control group 2.

[556] Regarding the case of *te'-el* as a either 1POSS and 1ATTR (see Chapter 2.1.1.2), the linguistic evidence has decided the question in favour of the part/whole possessive. See footnote 732 for an in-depth discussion.

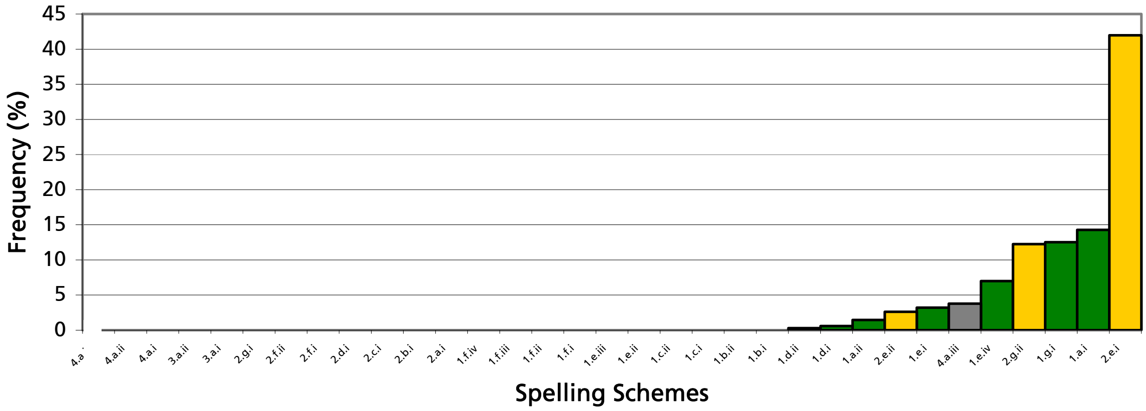

Figure 28: Relative frequency of spelling schemes for control group 1 with $N_{F(1)}$:=|343|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 135$ and $k = 198$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified. Also, H_0 can be proven true, as the test for spelling group delivers: $n_2 = 195$ and $k = 124$ with $p \approx 0.30$ and $\alpha = 0.99$.

Scheme 2.e.i is most prominent with 144 samples, of which 102 or 70.8% alone are being contributed by the part/whole possession marker. Otherwise, schemes 1.a.i with 49 and 1.g.i with 43 samples rank considerably lower and are almost exclusively associated with attributive spellings. Altogether, a significant amount of schemes provides a vowel harmonic syllabogram to indicate the suffix, either by $\mathbf{=lV_1}$ / __# < –*[V₁]l* or $\mathbf{CV_1{=}lV_1}$ / __# < –*V₁l* spellings.

3.3.3.2.1 – Part/Whole Possession Marker *–el*

Unlike the test group 1 showcases, the part/whole possession suffix *–el* exhibits a very uniform spelling practice (Figure 29). The lexical diversity is very limited and also influenced by text genres.

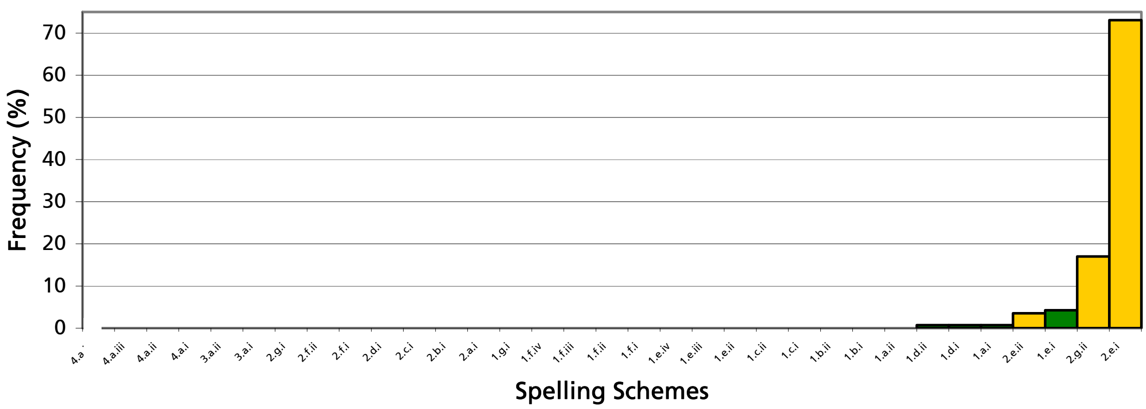

Figure 29: Relative frequency of spelling schemes for control group 1POSS with $N_{F(1POSS)}$:=|141|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 9$ and $k = 86$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 132$ and $k = 56$ with $p \approx 0.30$ and $\alpha = 0.99$.

A total of 103 samples (73.0%) pertains to scheme 2.e.i with =**le** < *–[e]l*, mirroring the underspelled suffix vowel. Only 5 samples (3.5%) of scheme 2.e.ii provide a disharmonic spelling with =**lV**< *–[e]l*, with 3 cases of =**la** and two of =**li**. Frequently, the suffix is completely underspelled as a 2.g.ii case with =**Ø** < *[–el]* in 24 cases (17.0%).

Only 8 samples actually provide the suffix vowel by **Ce=le** ~ =**e-le** / __# < *–el*. These are spellings of schemes 1.a.i, 1.d.i and 1.e.i, plus 1 case with a disharmonic 1.d.ii spelling **Ce=la** / __# < *–el*.

Five different roots account to this showcase, while *te'* alone comprises 107 cases (75.9%) exclusively from ceramic vessels. In any case, a constant suffixation with a suffix vowel harmonic =**le** is testified.

3.3.3.2.2 – Attributive Nominal Suffix *–V₁l ~ –el*

Although no ~ *–el* allomorphs have been attested in attributive function, the other ~ $–V_1l$ cases are supposed to be an adequate substitute for spelling practices. The distribution is unsimilar to the part/whole possession, but much more alike to 1PASS, if each ~ $–V_1l$ allomorph is taken as a fixed vowel suffix (Figure 30).

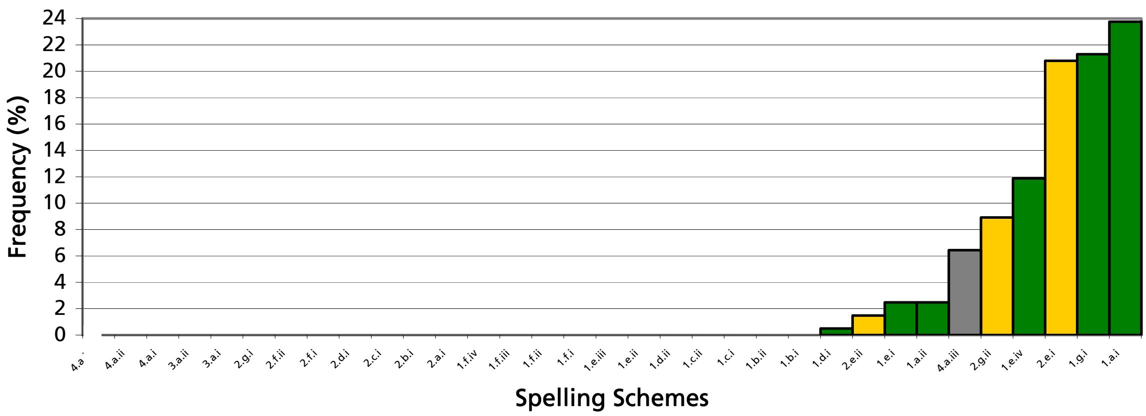

Figure 30: Relative frequency of spelling schemes for control group 1ATTR with $N_{F(1ATTR)}$:=|202|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 126$ and $k = 121$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true, and H_0 is falsified. The test for spelling group 2 delivers: $n_2 = 63$ and $k = 77$ with $p \approx 0.30$ and $\alpha = 0.99$.

Two roots comprise 54.5% of all samples, these are *tzih* with 56 and *k'uh* with 54 samples. Breaking down the number of roots and samples to a specific root vowel, /a/, /i/ and /u/ have a similar amount of samples, but a difference among the lexemes[557]. With still a considerable amount of root harmonic 2.e.i spellings =**lV**$_1$ < $–[V_1]l$ with 42 samples, the majority of cases are attributable to spelling group 1. A total of 48 samples are scheme 1.a.i with **CV**$_1$=**lV**$_1$ / __# < $–V_1l$ spellings, and 42 are scheme 1.g.i with **CV**$_1$=**Ø** / __# < $–V_1[l]$ underspellings. Notable is the high amount of 1.e.iv overspellings with =**CV**$_1$**l** / __# < $–V_1l$, where the onset of the suffix morphograph mirrors the coda of the root morphograph (with /j/ ~ /h/). Interestingly, none of these cases uses a **ʔVC** grapheme. Underspellings of a 2.g.ii case with =**Ø** < $[–V_1l]$ occur with 18 samples.

Disharmonic patterns only occur with only 8 samples or 4.0% of all samples. These are 5 cases of 1.a.ii with **CV**$_1$=**la** ~ **CV**$_1$=**le** / __# < $–V_1l$ and 3 samples of 2.e.ii with =**la** / __# < $–[V_1]l$.

In case the 13 cases of 4.a.iii with *taj* are indeed just 2.g.ii underspellings, the amount of spelling group 2 would increase to n_2 = 76 samples, leaving n_1 unchanged. The significance test for group 2 would then result in k = 77, leaving the overall result for group 1 H_1 and H_0 unchanged.

3.3.3.3 – Test Group 2

For test group 2, the analyses review the realisation of $–V_1(w)$ / $–V$ and $–V_1w$ suffixes as the role model for suffixes with a variable, root harmonic vowel (Figure 31). The results are taken to compare them with the spellings of control group 2. It needs to be reiterated that based on the linguistic premises, showcase 2IND is likely only $–V_1$ / __#. But together with 2ANTIP, it is realised by =**wV** signs on the graphematic level. However, a comparison of both showcases combined already demonstrates that despite the root harmonic vowel, the orthographic realisation is much different to showcase 1ATTR, inasmuch as less vowel-providing spellings appear and a far greater percentage of disharmonic patterns.

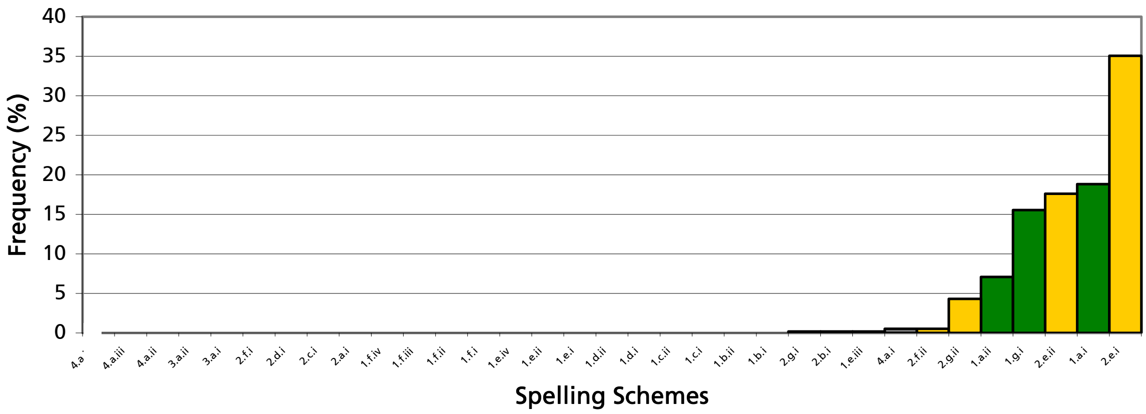

Figure 31: Relative frequency of spelling schemes for test group 2 with $N_{F(2)}$:=|579|. Sven Gronemeyer.

[557] A total of 26 roots, there are (CV)CaC: N_R := |11| and N_S := |63|; (CV)CiC: N_R := |9| and N_S := |72|; (CV)CoC: N_R := |1| and N_S := |4|; (CV)CuC: N_R := |5| and N_S := |63|. Regardless the root vowel, spelling group 1 is preferred, although (CV)CaC lexemes might receive a slight prevalence if the 13 4.a.iii cases turn out to be 2.g.ii underspellings. (CV)CiC roots show the most distinct preference for group 1 versus group 2 spellings (60 / 12 samples) that is even retained when removing the samples of *tzih* as the single most prominent root (13 / 3). The same for *k'uh* with (CV)CuC roots, where the ratio changes from 33 / 30 to 7 / 2 samples.

The test for spelling group 1 delivers: $n_1 = 241$ and $k = 326$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 335$ and $k = 201$ with $p \approx 0.30$ and $\alpha = 0.99$.

Spelling schemes 2.e.i and 2.e.ii together comprise 305 samples (52.7%), where =**wV** / __# < *–[V₁](w)*. Only 150 samples (25.8%) belong to schemes 1.a.i and 1.a.ii, where **CV₁=wV** / __# < *–V₁(w)*. 90 cases (15.5%) provide at least the suffix vowel, but underspell as scheme 1.g.i with **CV₁=Ø** / __# < *–V₁(w)*, while 25 samples (4.3%) underspell entirely as a 2.g.ii case.

The amount of 2.e.i spellings with a syllabogram reflecting the suffix vowel is nearly twice as much the number of disharmonic 2.e.ii spellings. It is up to the individual showcases to work out harmony patterns and pursue the question of constant use of a specific =**wV** sign.

3.3.3.3.1 – Root Transitive Marker *–V₁* and Non-CVC Transitive *–V* Marker

Transitive indicative verbs comprise the larger part of test group 2 (Figure 32). Considering the vowel-only marker, it is of interest what syllabograms are applied to graphematically indicate the suffix, and how frequently. Furthermore, spelling group 1 is able to testify the stem-formative vowel of derived transitives[558].

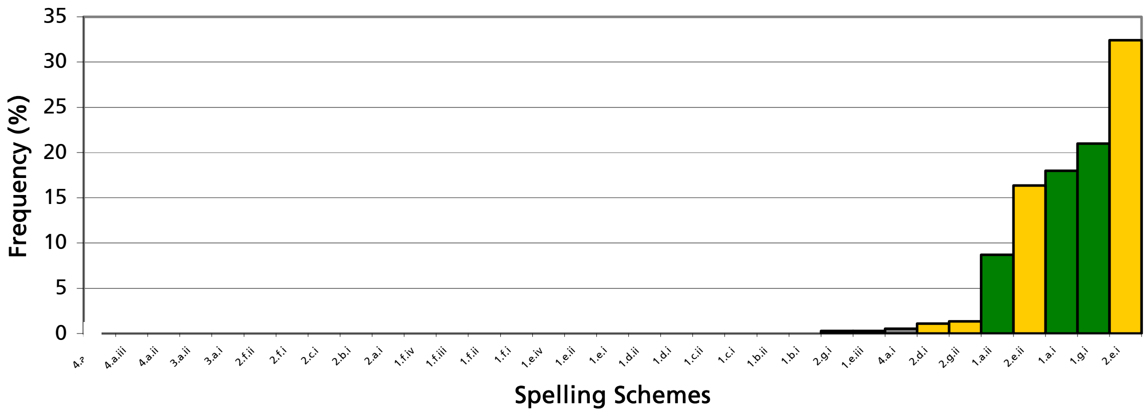

Figure 32: Relative frequency of spelling schemes for test group 2IND with $N_{F(2IND)}$:=|367|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 176$ and $k = 211$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 189$ and $k = 132$ with $p \approx 0.30$ and $\alpha = 0.99$.

A total of 179 samples (48.8%) comprise schemes 2.e.i and 2.e.ii, showing a prevalence of just morphographic roots with =**wV** / __# < *–[V₁]*. Schemes 1.a.i and 1.a.ii make up 98 samples (26.7%) with **CV₁=wV** / __# < *–V₁*, while 1.g.i cases with **CV₁=Ø** / __# < *–V₁* still mark 77 cases (21.0%) which are of interest regarding orthographic change (see Chapter 3.3.6.2). Other patterns are insignificant.

[558] In conjunction with showcase 4TEMP, based on the linguistic premises outlined in Chapters 3.1.3.2 and 3.1.7. A thorough discussion of stem-formative suffixes takes place in Chapters 4.1.8 and 4.1.19.

There are indeed no 1.f.# samples, as MacLeod (2004: 298, 324) was predicting, and no **=wV** / … < *–V_1w* have been found.

The obvious gap between synharmonic and disharmonic suffixation indicates that one or more **=wV** patterns were preferred. Indeed, 269 samples (73.3%) are suffixed with **=wa**, regardless of the root or suffix vowel. Only 11 cases (3.0%) are written with **=wi**: 1 example of 1.a.ii, the remains are 2.e.ii spellings, i.e. these have not specifically been chosen because the root is CiC. There is a clear tendency for a constant suffixation with an overspelled **=wa**, even if the suffix is just *–V_1* with a CVC root or *–V* with a non-CVC or derived stem.

Only 18 samples (4.9%) with plain status are non-CVC and derived transitives[559]. 50% of them do not take a **=wa** suffix and distribute among 8 samples of 1.g.i and 1 of scheme 2.g.ii. The other half is allocated among 1 case of 1.a.i, 4 of 2.d.i and 4 of 2.e.i. Another 5 samples (1.4%) possibly do not reflect a plain status, but are subjunctive, 4 of them spelled by scheme 1.g.i (see Chapter 4.1.8).

3.3.3.3.2 – Antipassive Suffix *–V_1w ~ –Vw ~ –w*

Antipassive derivations comprise the other part of test group 2 (Figure 33). One major question is what syllabograms are applied to indicate the suffix and if and how often syncopations may occur.

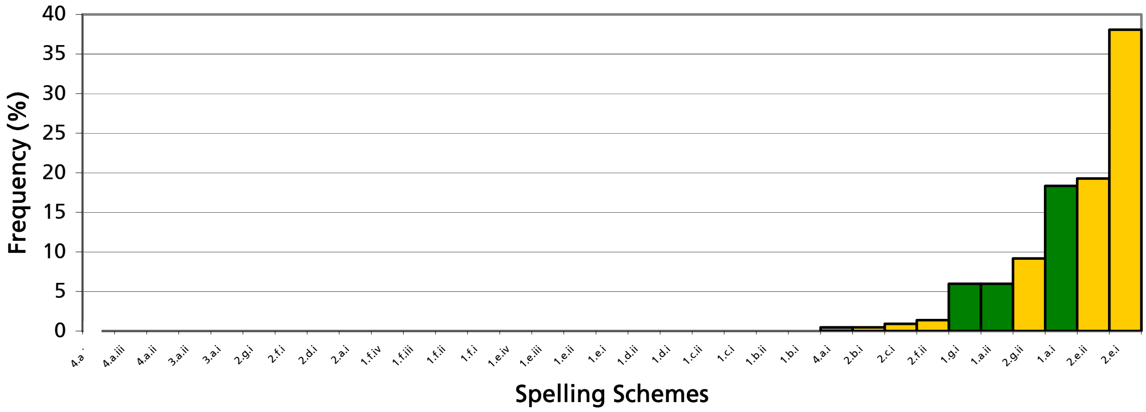

Figure 33: Relative frequency of spelling schemes for test group 2ANTIP with $N_{F(2ANTIP)}$:=|218|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 66$ and $k = 129$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 151$ and $k = 82$ with $p \approx 0.30$ and $\alpha = 0.99$.

Schemes 2.e.i and 2.e.ii are represented by a total of 125 samples (57.3%), demonstrating a preference to write with morphographic roots and **=wV** / __# < *–[V_1]w*. Schemes 1.a.i and 1.a.ii comprise 53 samples (24.3%) with **CV$_1$=wV** / __# < *–V_1w*, while 1.g.i cases with **CV$_1$=Ø** / __# < *–V_1[w]* only mark 13 cases (6.0%), all from the codices. Scheme 2.g.ii underspellings with **=Ø** / __# < *–[V_1w]* ap-

[559] A total of 3 roots, these are *il-a* with N_S := |6|; *it-a* with N_S := |5|; and *kab-a* with N_S := |7|. Two other ʔVC roots do not account to this group: *ak'* with N_S := |27|; *al* with N_S := |3|. Both act like CVC roots and are also reconstructed without any stem formative suffix in pCh (Kaufman and Norman 1984: 115, 116). See Chapter 4.1.8 for a detailed discussion on derived transitives.

pear with 20 samples (9.2%) that by parallel examples can be excluded to be *–Ø* 'antipassives' of a nominal type, all originate from nominal phrases. Only 3 examples with syncopation are among scheme 2.f.ii, all followed by a temporal enclitic; no 2.f.i example of =**wi** < *–w-i* can securely be attested.

As with case 2IND, the amount of synharmonic and disharmonic suffixation indicates that one ore more =**wV** patterns were preferred. Overall, the tendency is not as clear at first sight. 99 samples (45.4%) are suffixed with =**wa**, of which 84 cases (84.9%) are a CaC root. On the other hand, only 30 of the remaining 76 samples (39.5%) with =**wi** have a CaC root. Although not as distinct as with 2IND, there is a strong tendency towards a constant suffixation with two **wV** signs: =**wa** / CaC__ and =**wi** in all other instances. Other constraints (e.g. absolute/incorporating antipassive) have thus far not been considered, but seem unlikely. Only 1 sample of a non-CVC or derived transitive appears in the showcase.

3.3.3.4 – Control Group 2

Test group 1 delivers a very clear result in favour of spelling group 2, which is highly significant for both showcases. Furthermore, a strong preference for a constant suffixation with not more than two different =**wV** signs is given. In the case of 2IND, the alternate is almost insignificant, while 2ANTIP tends to choose according to the root vowel.

As control group 2 also generally follows the pattern of a root harmonic suffix vowel, we can also expect the constant graphematic indication of the suffix by not more than two different **yV** signs per showcase. Another direct conclusion from test group 1 is apparently a broad set of morphographs existing to make spelling group 2 that significant. If this condition also applies to control group 2, spelling schemes from this group should constitute the majority of samples (Figure 34).

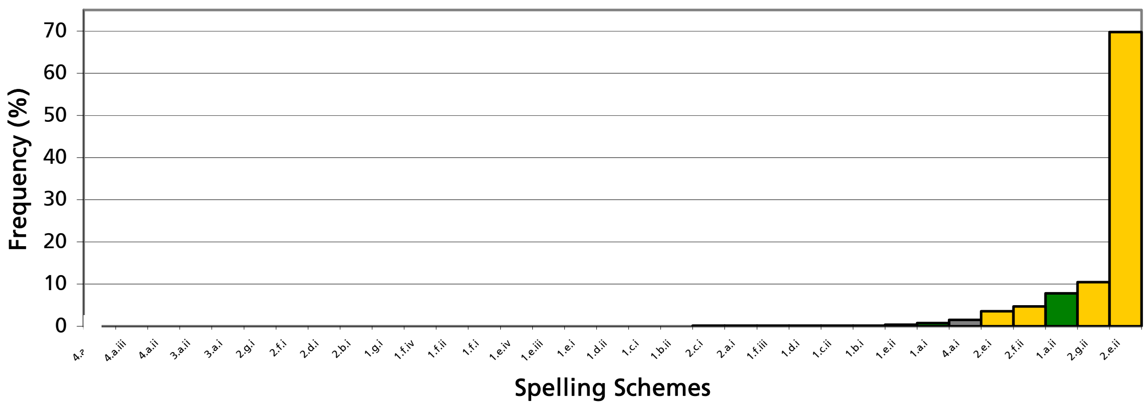

Figure 34: Relative frequency of spelling schemes for control group 2 with $N_{F(2)}$:=|536|. Sven Gronemeyer.

Within the control group, showcase 2POS has not found a single even debatable attestation. Since it is only expected in a pTz vernacular context (see Chapter 3.1.4.2), it was either not used by scribes in the Chiapas region or the historical linguistics need to be refined (see Chapter 4.1.16)[560].

The test for spelling group 1 delivers: $n_1 = 52$ and $k = 303$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 476$ and $k = 187$ with $p \approx 0.30$ and $\alpha = 0.99$.

The assumptions made on the basis of test group 2 are overall confirmed. However, as the results for control group 2 are heavily influenced by showcase 2MED, no further details will be discussed. Individual patterns are subject to the individual showcase reviews.

3.3.3.4.1 – Mediopassive Suffix *–V₁y ~ –Vy ~ –y*

The mediopassive diathesis comprises 96.1% of all samples within test group 2. The analysis provides a very clear pattern towards a standardised spelling (Figure 35).

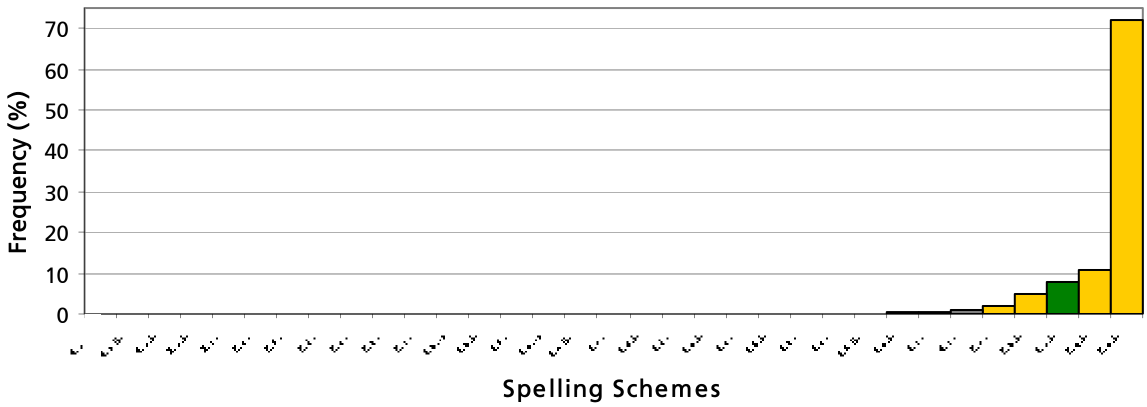

Figure 35: Relative frequency of spelling schemes for control group 2MED with $N_{F(2MED)}$:=|516|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 47$ and $k = 292$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 465$ and $k = 181$ with $p \approx 0.30$ and $\alpha = 0.99$.

Schemes 2.e.i and 2.e.ii comprise a total of 384 samples (74.4%), demonstrating a preference of morphographic root spellings with **=yV** / __ < *–[V₁]y*, while suffix vowel disharmonic scheme 2.e.ii alone covers 373 cases (72.3%). Schemes 1.a.i and 1.a.ii make up 43 samples (8.3%) with **CV₁=yV** / __# < *–V₁y*, again the disharmonic scheme 1.a.ii dominates with 40 cases (7.8%). Scheme 2.g.ii underspellings with **=Ø** / __# < *–[V₁y]* appear after all with 56 samples (10.9%). Syncopations of the mediopassive derivation as 2.f.ii schemes with a suffix to follow occur with 25 samples (4.9%).

The extraordinary amount of 1.a.ii and 2.e.ii schemes indicates the preponderance of one specific syllabogram to indicate the suffix on the graphematic level. In fact, only 17 samples (3.3%) are not

560 A few potential cases have ultimately not been attributed to this showcase, but to other, more plausible ones. The linguistic rationale is provided with the discussion along the historical linguistics.

realised by =**yi**: 1 sample with =**ye** as a 1.a.i scheme, the remaining 16 cases spell with =**ya**. In 13 cases out of these 17, the syllabogram is root vowel harmonic with 1.a.i or 2.e.i spellings, only three are disharmonic as scheme 2.e.ii and in 1 case of scheme 1.f.iii, the mediopassive follows a derived transitive verb. There is a very strong tendency for a constant suffixation with =**yi**, which is supposed to also provide a completive *–i* suffix. None of the samples features a CiC root, and all harmonic suffixations with =**ya** appear with CaC roots, but their amount is almost insignificant.

The root *t'ab* outweighs among the showcase with 262 samples (50.9%), most of them originating from ceramics. In total, 27 different roots have been counted for this showcase.

3.3.3.4.2 – Intransitive Marker $-V_1y$ ~ $-Vy$

The amount of $-V_1y$ intransitive thematic suffixes samples is ideally too low for a statistical test. There is nevertheless a clear tendency and the lexical range comprises at least five different lexemes (Figure 36).

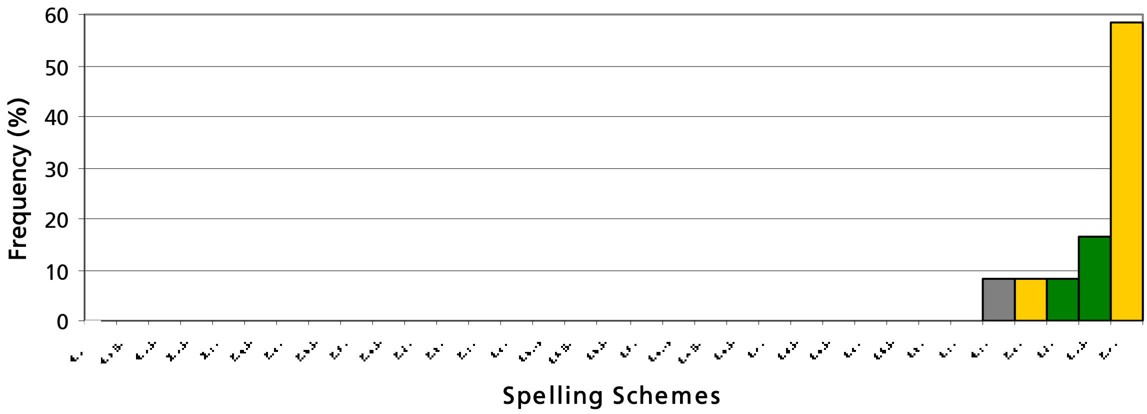

Figure 36: Relative frequency of spelling schemes for control group 2COM with $N_{F(2COM)}$:=|12|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 3$ and $k = 10$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 8$ and $k = 8$ with $p \approx 0.30$ and $\alpha = 0.99$.

Spelling scheme 2.e.i comprises 7 samples (58.3%) and is the most prominent choice of writing by =**yV** / __# < $-[V_{(1)}]y$. The preference for a constant suffixation with a certain =**yV** is less pronounced: the 7 samples of scheme 2.e.i feature =**ye**, 2 have =**ya** as schemes 1.d.ii and 2.c.i, and 2 have =**yi** as 1.a.ii schemes. One additional =**ya** is unclear as a 4.a.i case. All except the 4.a.i case are verbs of motion and the 8 cases of 1.d.ii and 2.e.i suggest the suffix to be a fixed-vowel *–ey*, consistent with the linguistic data for these verbs[561].

[561] Only three verbs apply, these are these are *ehm* with N_S := |5|; *hul* with N_S := |3|; and *ahn* with N_S := |1|. Only *ahn* provides the suffix vowel, while it requires reconstruction for the other cases. The linguistic implications are subject of Chapter 4.1.13.

3.3.3.4.3 – Versive Suffix *–Vy*

The amount of samples for the general versive is ideally too low for a statistical test. No clear pattern is provided by the sampled evidence (Figure 37).

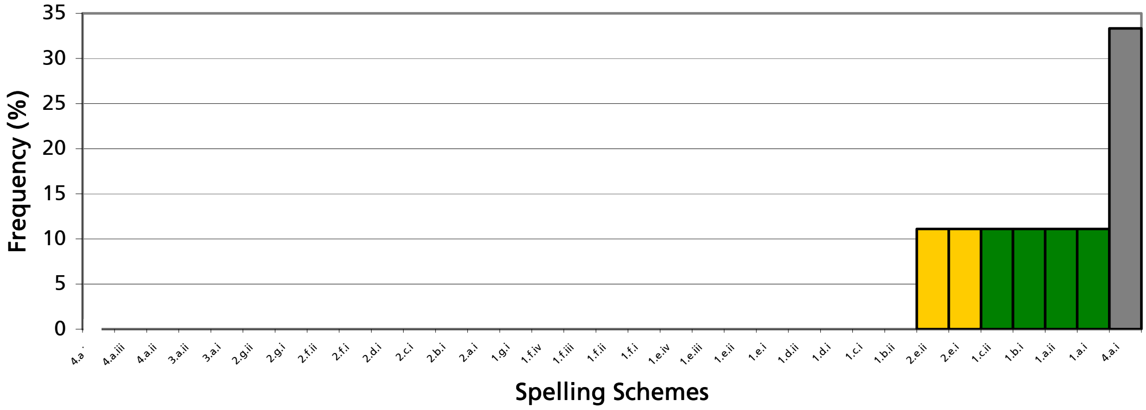

Figure 37: Relative frequency of spelling schemes for control group 2INCH with $N_{F(2INCH)}$:=|9|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 4$ and $k = 8$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified, but H_0 also cannot be proven true, as the test for spelling group 2 delivers: $n_2 = 2$ and $k = 6$ with $p \approx 0.30$ and $\alpha = 0.99$. No scheme alone is significant enough.

There are 3 cases of an unclear 4.a.i scheme, as the deciphering of the root is tentative. In case they would re-classify as spelling group 2 samples, the test result would not be changed[562]. We can only make out a contrast between 4 vowel-providing spellings (44.4%) **CV=yV** / __# < *–Vy(-i)* and 2 vowel suggesting spellings. Prevalent with 6 cases is the suffix indication by **=yi** to provide the completive marker *–i*, 2 by **=ya** and one by **=yu**. In two of the four group 1 samples, the suffix vowel indicated is not root harmonic, in accordance with the linguistic data that show *–ay* ~ *–iy* as the suffixes.

3.3.3.5 – Test Group 3: Instrumental Suffix *–Vb* ~ *–b*

Test group 3 reviews the orthographic ways to represent a variable vowel suffix by means of the instrumental *–Vb* (Figure 38). Although the discussion of the linguistic data has shown a prevalence of certain vowels that under certain semantic conditions may be predictable, such assumptions are pending a comprehensive orthographic review.

The major objectives of this test group are to examine which vowels where used for this suffix, based on lexical evidence and semantics. At the same time this requires the investigation not only of vowel providing spellings, but even more the kind of syllabogram is used as a possible indicator. The pursuit of this question also requires even more the consideration of potential suffixes to follow the instrumental that may alter the value of syllabogram by the vowel of the suffix to follow.

[562] Seven roots have been identified, four are nouns (potentially plus one for the 4.a.i cases), two are adjectives. The linguistic implications are subject of Chapter 4.1.15.

It has to be stressed that the permutation of these conditions must be judged on a case-by-case basis. Despite the methodology for the sample collection, the handling of test group 3 is more error-prone than the previous showcases. In order to minimise the ramifications for the analysis results, the spelling scheme attribution requires duly discussion of all conditions that may affect the suffix vowel assignment for the samples and its graphematic indication.

Also, spelling group 2 plays a less significant role for both test and control group 3. The suffixation with a morphographic root are handled by spelling group 3 schemes. Group 2 schemes only come into play with a restricted number of cases, e.g. with the underspelling of the suffix syllabogram or in cases of syncopation. Therefore, the significance test against spelling group 1 also takes place with the samples from group 3.

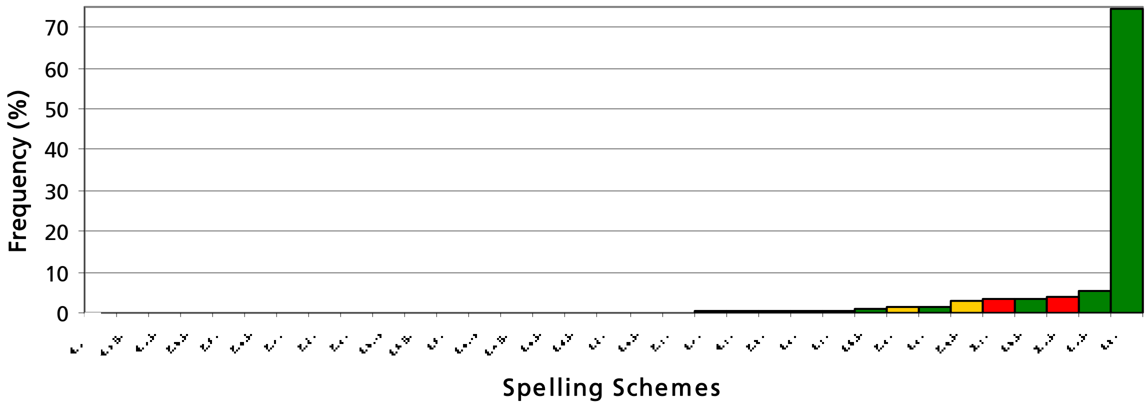

Figure 38: Relative frequency of spelling schemes for test group 3INSTR with $N_{F(3INSTR)}$:=|515|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 449$ and $k = 292$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true and H_0 is falsified, as the test for spelling group 3 delivers: $n_3 = 37$ and $k = 44$ with $p \approx 0.06$ and $\alpha = 0.99$.

Pure morphographic spellings of schemes 3.a.i and 3.a.ii are not very significant, and only comprise of 37 samples (7.2%) and distribute along 17 samples for scheme 3.a.i (3.3%) and 20 scheme 3.a.ii (3.9%). All samples of scheme 3.a.i indicated by =**bi** < *–[i]b* are with two different lexemes, *uk'* (2) and *way* (15). For *uk'*, syllabic substitutions prove /i/, for *way*, lexical evidence supports /i/. Of the 15 examples with *way*, 13 feature =**bi** / …, 12 of them with =**li** indicating an *–il* possessive suffix (Houston, Robertson and Stuart 2001b: 27, fig. 11). All samples of scheme 3.a.ii are =**bi** / __# < *–[a]b* spellings with *way*, for which the phonemic complement **ya** suggests /a/ (if not a 2.a.i scheme).

The group 3 spellings do not support a pattern =**ba** < *–[a]b* ~ =**bi** < *–[i]b*, so how are **bV** signs distributed? Of all spellings, only 11 samples (2.1%) make use of =**ba**, 4 spellings of scheme 1.a.i, 1 of scheme 1.b.i and 4 of scheme 1.b.ii, with 2 remaining doubtful as scheme 4.a.i. That means that only in 5 cases there is a relation **Ca**=**ba** < *–ab* (one being **Ca**=**ba** / …), and only 4 with a CaC root. 480 samples (93.2%) write the instrumental suffix with a =**bi** sign, only 37 of them (7.2%) are =**bi** / …, in all cases with a possessive suffix =**li** ~ =**la** < *–il* following. This leaves 14 cases (2.7%) of 2.g.ii underspellings, where any **bV** sign is omitted. That means that regardless of the suffix vowel, =**bi** is almost constantly used, and not necessarily because an underspelled *–iC* suffix is following.

When turning to the vocalisation of the instrumental suffix, *–ib* occurs with 457 samples (88.7%). 408 cases (79.2%) directly provide the suffix vowel: 382 of them are 1.b.i cases, 4 are 1.b.ii cases with =**ba**, 3 are 1.c.i schemes, 2 are full spellings =**i-bi** of scheme 1.e.i, 13 are 1.f.ii cases following a **Ci** grapheme indicating a preceding *–(V)C* suffix (all intransitivising), and 8 cases underspell as a 1.g.i scheme. From the remaining 49 cases, 4 provide a root final syllabogram mirroring the root vowel as 2.a.i and 2.b.i cases, 8 cases of 2.g.i do not provide a root final syllabic sign, 13 omit the indicating syllabogram as a 2.g.ii scheme, and 17 are scheme 3.a.i. Three cases require discussion as 4.a.i cases. For *–ab*, a total of 52 samples is collected. For 31 of them (59.6%), the suffix vowel is provided: 4 cases of 1.a.i with =**ba**, 26 cases of 1.a.ii with =**bi**, and 1 case of 1.b.i with =**ba**. The remaining cases are 1 omittance with a 2.g.ii spelling and the 20 scheme 3.a.ii spellings. Only 2 cases with *–ub* as a 1.a.ii scheme are known with *juk*, likely as a fossilised and lexicalised form. Additionally, there are five cases of an *–(a)jib* suffix that may represent an ECh vernacular.

Regarding the derivational basis, the linguistic evidence that the instrumental requires an intransitive or a detransitivised form is largely confirmed, if the case of *uk'* is blinded out (to be reviewed with all other cases in Chapter 4.1.17). Only 16 samples in total (3.1%, or 15.4% from 104 samples without *uk'*) deviate: 9 cases of *ok* form the instrumental possibly with a nominal root (or a cognate form to *och*), 1 with *chum* from a positional root (as a CHR vernacular), 1 with the transitive root *laj* (which may involve a <*h*> passive, though), 2 with the likely transitive root *juk* (likely as a fossilised form), and 3 with the supposed derived transitive base *ma[h]n* (left as 4.a.i cases). No pattern is detectable that shows a correlation between the derivational basis and the suffix vowel or spelling pattern.

However, it needs to be noted that among the 383 cases of scheme 1.b.i that comprises 74.4% of all instrumentals, only 7 samples are not **yu=k'i=bi**. This spelling is abundant from the high number of ceramic vessels in the corpus. It biases the result and is not solid proof for a preference of vowel-integration for variable vowel suffixes, or at least for test group 3. The apparent conventionalisation with this lexeme is rather related to another faced of 'writing economy' to be discussed in Chapter 4.2.2.2.

In fact, when the amount of 1.b.i cases is reduced to the maximum mean deviation of spelling group 1, 116 samples would remain. This would still leave spelling group 1 H_1 true with $n_1 = 182$ and $k = 146$ with $p \approx 0.51$ and $\alpha = 0.99$, but would not falsify H_0, as spelling group 3 would deliver: $n_3 = 37$ and $k = 24$ with $p \approx 0.06$ and $\alpha = 0.99$, making it significant as well. Chopping the amount down to the mean of 26 samples would even falsify H_1 and prove H_0. Still, among spelling group 1 are only 14 samples with a morphographic root, none of them writing **UK'**.

3.3.3.6 – Control Group 3: Nominaliser Suffix *–Vl*

Test group 3 provides a clear result for spelling group 1, despite the fact that it is biased by a large amount of syllabic spellings for *y-uk'-ib*. It also testifies a clear preference for just one of the possible allomorphs and a strong tendency for the constant suffixation with one =**bV** sign that does not necessarily need to reflect the suffix vowel even with group 3 spellings.

The linguistic premises for test group 3 indicate a requirement for intransitive or detransitivised bases (to be reviewed in Chapter 4.1.18). The analysis for control group 3 (Figure 39) needs to consider intransitive and transitive forms that can be nominalised, both with slightly different semantics and preferences for the suffix vowel: the intransitive (and detransitivised) verbal noun on *–el* and the transitive gerund on *–ol*, with other *–Vl* allomorphs possible, especially in vernacular contexts (left for further discussion in Chapter 4.1.18).

With the results from test group 3, we can assume that we also find a prevalence with one =**Vl** sign, with others only playing a minor role. Spelling group 1 cases supposedly play a major role in order to provide the correct suffix vowel. Along spelling group 3, the nominaliser allomorph and thus the underspelled suffix vowel is expected to be conditioned by the valency of the verbal form.

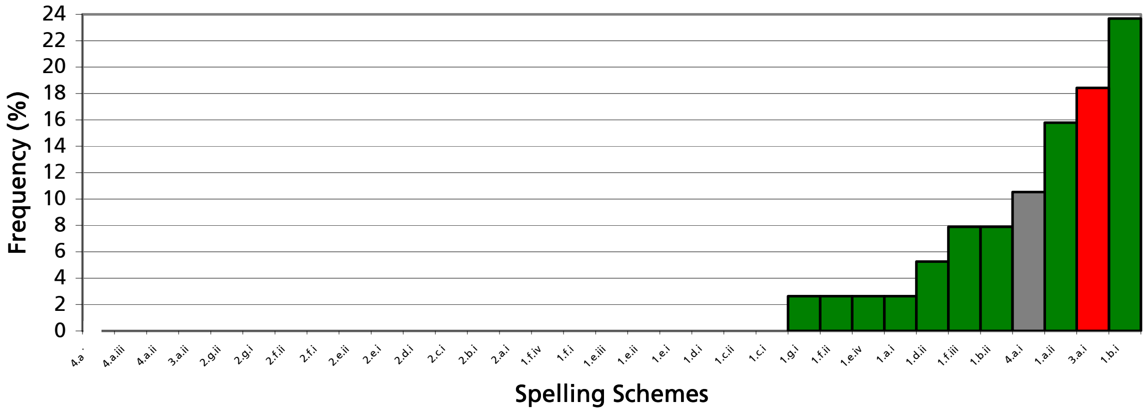

Figure 39: Relative frequency of spelling schemes for control group 3NMLS with $N_{F(3NMLS)}$:=|38|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 27$ and $k = 27$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 \geq k$, H_1 is proven true, but H_0 is not falsified. The test for spelling group 3 delivers: $n_2 = 7$ and $k = 6$ with $p \approx 0.30$ and $\alpha = 0.99$, hence $n_2 \geq k$ as well. The significance of both spelling groups is equally similar, although numerically spelling group 1 outweighs group 3 with 71.1% of all samples.

Morphographic spellings comprise only 7 cases (18.4%) of scheme 3.a.i. 5 examples are on an intransitive or detransitivised basis with =**le** < *–[e]l*, another with =**li** < *–[i]l* (a probable pYu form), and 1 sample is a transitive on =**lo** < *–[o]l*. Spelling group 3 indicates that constant suffixation is apparently not used for nominalisations.

Among test group 1, schemes 1.b.i and 1.b.ii are most common with 12 samples (31.6%), i.e. the root spelling is deliberately altered to provide the suffix vowel. In this respect, showcase 3NMLS is not too different from 1PASS, 1INCH or 3INSTR that also show a considerable root spelling alternation to support a suffix vowel-providing suffix rendition. Scheme 1.b.i has 9 examples, 6 base on an intransitive or supposed detransitivised basis (as the passive on <*h*> is not directly attestable) with **Ce=le** < *–el*, another with **Ca=la** < *–al*, and 3 transitive samples on **Co=lo** < *–ol*. The 3 samples of scheme 1.b.ii are all intransitive or detransitivised bases with **Ce=la** < *–el* ~ **Ca=lo** < *–al*.

Schemes 1.a.i and 1.a.ii comprise 7 samples (18.4%), the 1 example of 1.a.i is a transitive with **Co=lo** < *–ol*. Scheme 1.a.ii is more diversified, 3 transitives feature **Co=la** < *–ol*, while 2 have **Cu=li** < *–ul*, 1 case is **Ce=li** / … < *–el* with an intransitive. In 4 cases of schemes 1.f.ii and 1.f.iii, the nominaliser follows an intransitiviser with =**Ce=le** and =**Ce=la** < *–C-el*. 4 cases of scheme 4.a.i require more discussion.

In total, suffix vowel disharmonic patterns comprise a total of 14 cases (36.8%), all with spelling group 1 (or 51.9% thereof). Regardless of the suffix vowel, the pattern **CV=la** / __# is most prominent with 10 cases, 2 with **CV=li** / __# and 1 with **CV=lo** / __# plus the **Ce=li** / … case.

Control group 3 broadly confirms the linguistic evidence and testifies that the syllabogram chosen is suffix vowel harmonic, with the option to use =**la** among group 1 spellings. The nominalisation is therefore more diverse than the instrumental, both in the phonology and the graphematics.

3.3.3.7 – Test Group 4: Temporal Suffix *–V₁j* ~ *–Vj* ~ *–j*

Test group 4 examines the temporal *–*V_1*j* ~ *–Vj* suffixes used as perfect markers used with transitive verbs (Figure 40). The restriction to this lexical class seeks to phonologically and functionally delimitate it from the temporal deictic enclitic *=ij(=iy)*. The main purpose of this test group is to testify the assimilation of the verbal status marker and thematic suffix with the perfect suffix and to find patterns for the suffixation with =**jV**. As the perfect is used in secondary statements that indicates anteriority, a frequent suffixation can be expected with the temporal deictic enclitic can be assumed, which eventually may result in syncopation.

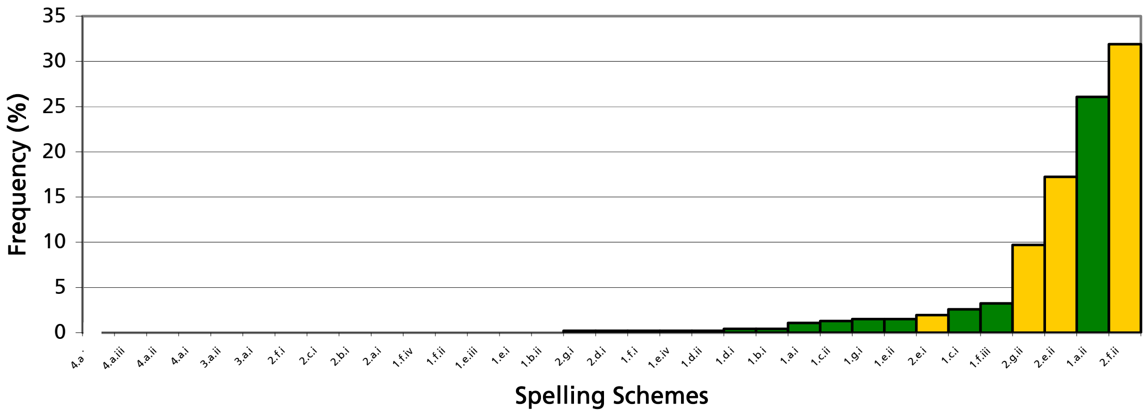

Figure 40: Relative frequency of spelling schemes for test group 4TEMP with $N_{F(4TEMP)}$:=|464|. Sven Gronemeyer.

The test for spelling group 1 delivers: $n_1 = 180$ and $k = 264$ with $p \approx 0.51$ and $\alpha = 0.99$. As $n_1 < k$, H_1 is falsified and H_0 can also be proven true, as the test for spelling group 2 delivers: $n_2 = 284$ and $k = 164$ with $p \approx 0.30$ and $\alpha = 0.99$.

The likely reason for the significant amount of group 2 spellings is the dominance of 2.f.ii schemes with 148 samples (31.9%), where vowel syncopation is assumed. In all cases, we find **=ji=ya** < *–j-Ø=iy* with the temporal deictic enclitic to follow a CVC root or stem, in all but three cases, the suffixes are following the derived transitive *kab*. In 120 cases (25.9%), we have a vowel-providing spelling of scheme 1.a.ii, among these, the following spellings apply: 14 samples of **CV=ji=ya** < *–Vj-Ø=iy* with a non-CVC root transitive, 101 cases of **CV=ji** / __#, 3 of **CV=je** / __#, and 2 of **CV=hi** / __# < *–Vj* (with /j/ ~ /h/). 16 cases (3.5%) have the suffix following a *–CV* transitiviser as 1.f.iii schemes, all as **=CV=ji** / __# < *–C-Vj*.

Plain morphographic root spellings as schemes 2.e.i and 2.e.ii occur with 89 samples (19.2%), while 2.e.i only has 9 cases of **=ji** / __# < *–[i]j*. The 80 cases of 2.e.i are mostly supposed *–[a]j* suffixes, which follow the following patterns: 5 samples of **=ji=ya** < *–[V]j-Ø=iy* with a non-CVC (root) transitive, 69 cases of **=ji** / __#, and 6 of **=je** / __# < *–[V]j*. 45 cases (9.7%) alone underspell the perfect suffix with **=Ø** < *–[Vj]* as 2.g.ii cases, in all cases except one follows **=ya** < *=[i]y* for the temporal deictic enclitic.

Especially the spelling group 1 cases are important to verify the stem-formative vowel of derived transitive verbs and compare with spellings from showcases 2IND and 2ANTIP. In fact, only 32 samples (6.9%) are CVC or non-CVC root transitives with $–V_1j$, the reminder are derived transitive verbs with *–Vj*. Regardless of the verbal basis and potential suffixes to follow, we can assert a constant suffixation with **=ji** / __# among 382 samples (82.3%), while other **=jV** spellings are insignificant.

Although test group 4 shows a large number of syncopations that do not contribute to vowel providing spellings, their number does not overly influence the significance test in favour of spelling group 2. When scheme 2.f.ii is reduced to the maximum mean deviation of spelling group 2, 75 samples would remain. This would still leave spelling group 2 H_0 true with $n_2 = 211$ and $k = 140$ with $p \approx 0.51$ and $\alpha = 0.99$. Chopping the amount down to the mean of 28 samples would still deliver $n_2 = 164$ and $k = 124$.

3.3.4 – Analyses by Spatial Data

The spatial analyses primarily review the distribution and significance of the four spelling groups and their schemes among the defined geographic regions. While the showcase-based analyses in Chapter 3.3.3 ignored any spatial or temporal dimension, the review on a regional basis fades out any functional and temporal aspects.

In a first step, the frequency of spelling schemes, united by their spelling group attribution, is reviewed. This provides a comparison across all regions and allows the isolation of significant patterns for individual regions (Figure 41). Not surprisingly, the spelling scheme frequency across the regions reflects the overall image from Figure 19.

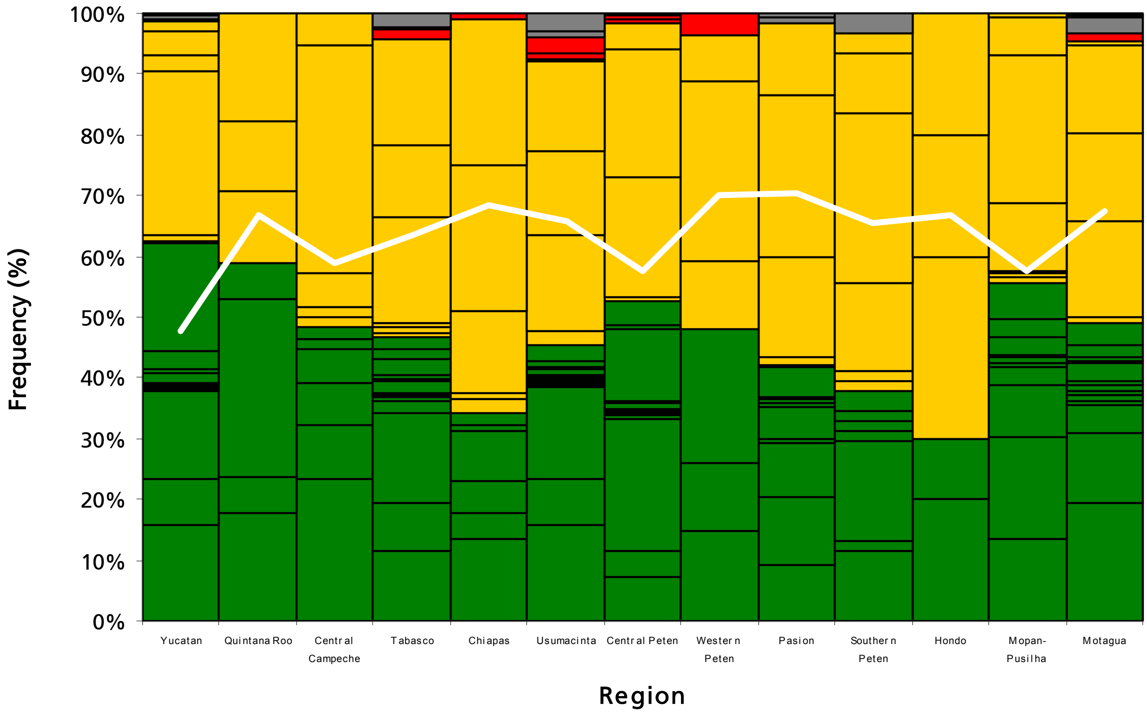

Figure 41: Relative frequency of spelling schemes across geographic regions with N_G :=|3229|, summarised by spelling groups (1: green, 2: yellow, 3: red , 4: grey) and indicating the overall root morphograph frequency (white line). Sven Gronemeyer.

Only in Yucatan with its amount of 60.3% group 1 spellings can H_1 be proven true with $n_1 = 281$ and $k = 265$ with $p \approx 0.51$ and $\alpha = 0.99$, but H_0 is not falsified. The test for spelling group 2 delivers: $n_2 = 179$ and $k = 165$ with $p \approx 0.30$ and $\alpha = 0.99$, hence $n_2 \geq k$ as well. Quintana Roo is also an exception, as no significance can be made out for any spelling group. The set only comprises of 18 samples and the tendency also points to spelling group 2. All other regions deliver results that falsify H_1 for spelling group 1 and at the same time prove H_0 to be true, as the amount of spelling group 2 samples always $n_2 \geq k$ with $p \approx 0.30$ and $\alpha = 0.99$.

There are different explanations possible why Yucatan differs from the other regions. These include rhetorics, scribal schools, and also a temporal perspective. Scrutinising the spelling patterns of Yucatan is therefore part of the discussion in Chapter 3.3.6.1 among the combined analyses. Otherwise, an individual statistical processing as done in Chapter 3.3.3 will not be done. Table 69 only summarises the results of the statistical significance tests, with the full data available in Appendix C.3.

Figure 41 shows a fluctuation range between the relative frequency of group 1 and group 2 spellings. Also, there is a considerable variance among individual spelling schemes. The overall frequency of roots written with a (complemented) morphograph also shows regional fluctuation.

Region	Total	Spelling Group 1		Spelling Group 2	
	N_G	n_1	k	n_2	k
Yucatan	466	281	265	179	165
Quintana Roo	18	10	14	8	10
Central Campeche	56	26	37	30	25
Tabasco	429	197	245	214	152
Chiapas	104	33	65	70	43
Usumacinta	409	178	234	201	146
Central Peten	928	457	513	458	314
Western Peten	30	13	22	16	15
Pasion	189	78	113	108	72
Southern Peten	64	23	42	39	28
Hondo	15	3	12	12	9
Mopan-Pusilha	215	112	128	103	81
Motagua	306	134	178	159	112

Table 69: Significance of spelling groups 1 and 2 across geographic regions. Parameters $p \approx 0.51$ for group 1 and $p \approx 0.30$ for group 2 with $\alpha = 0.99$ in all cases.

Comparisons with other regions show that the morphograph frequency among spelling group 1 is ≥30.0% in Quintana Roo, Tabasco, Chiapas, Usumacinta, Western Peten, Pasion, and Motagua, i.e. every third lexeme is written by a complemented morphograph. On the other end, in Central Campeche, Central Peten, and Hondo, the morphograph frequency for group 1 is ≤15.0%, i.e. pure syllabic spellings in these regions are much more significant within spelling group 1 than complemented morphographic renditions.

To better review regional preferences and possibly identify cross-regional patterns or regional peculiarities, the data matrix with the amount of samples per spelling scheme and region is redrawn in a frequency analysis chart (Figure 42). There is a loose correlation with the frequency of spellings among the individual showcases (Figure 21) visible in each region.

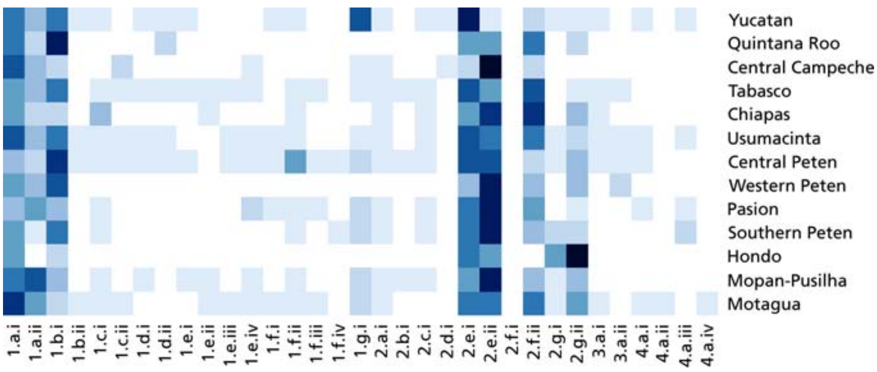

Figure 42: Heatmap of spelling scheme frequencies across geographic regions with N_G :=|3229|. Sven Gronemeyer.

As the analysis by spatial data is detached from functional aspects and the relation of constant suffixation patterns by either suffix vowel harmonic or disharmonic graphemes, it would seem apt not to separate between harmony patterns. While this appears to be largely true for 2.e.i and 2.e.ii schemes, there is a clear separation between the 1.a.i and 1.a.ii as well as 1.b.i and 1.b.ii schemes, across all regions. Certain schemes are almost like a thread of cross-regional orthographic preference. Also, regional peculiarities between harmony patterns are still desirable to review. They may simply indicate regional orthographic preferences, but also be the result of deeper linguistic phenomena (including a temporal dimension). A significant deviation between the harmony patterns in one region can also be indicator for rhetorical preferences. Not all regions receive an individual review, only those that have clear deviations beyond an expected fluctuation.

Yucatan has the largest offset in favour of scheme 2.e.i (123 samples, 26,4%) to 2.e.ii (11 samples, 2.4%), while the ratio between the two is overall more or less the same (17.3% to 15.8%)[563]. It is largely the result of the absence of morphographs with a suffix vowel disharmonic spelling, including a high number of samples from 1ATTR, 1PASS and 2IND; the latter with CaC roots and stems. Significant is the relative high amount of 1.g.i spellings (80, 17.2%) in comparison with the overall ratio (5.2%): 43 samples belong to 2IND, 18 to 1PASS, and 13 to 2ANTIP. Notable is also the lower amount of syncopated 2.f.ii spellings (18, 3.9%) in comparison to the overall mean (9.2%), indicating a less complex narrative nexus operating with anteriority and posteriority, as the temporal deictic enclitic is the most common suffix following a syncopated suffix. Certain characteristics of the spelling practices in Yucatan will again be reviewed in Chapter 3.3.6.1, also involving a temporal perspective.

Central Campeche shows a clear shift towards 2.e.ii schemes (21, 37.5%) compared to 2.e.i (3, 5.4%). There are several peculiarities observable: 2 deviations among 2IND use =**wi**, also 2 CaC roots among 2ANTIP use =**wi**, while 4 others use =**wa** (although these would remain 2.e.i if used with =**wi**). 2 cases of 1PASS use =**ji**, but this has already been described as a more common feature with *il-a*.

Hondo only has 15 samples, but it is notable that among them, a considerable amount are deficient underspellings. 2 cases (13.3%) of 2.g.i provide the suffix grapheme, but underspell the root coda and 5 samples (33.3%) of 2.g.ii omit the suffix in writing.

Mopan-Pusilha also shows a clear shift towards 2.e.ii schemes (49, 22.8%) compared to 2.e.i (22, 10.2%). This is simply induced by the lower figure of suffix vowel harmonic spellings. Among scheme 2.e.ii, only the following notes can be made: 4 CaC roots among 2ANTIP use =**wi**, 2 deviations among 2IND use =**wi**, otherwise there are relatively more 2MED and 4TEMP cases in comparison to the other examples.

In general, the regional comparison reveals little evidence for significant differences among spelling practices, with the exception of Yucatan. Notable deviations in the frequency of one spelling are rather explained by the overall amount of samples per region and only secondary by rhetorics. In direct correlation to the regional data quantity, differences are rather because of the amount of samples for one showcase, often with a more or less obvious proportionality to the lexical diversity.

A comparison with the data presented in Figure 16 and Table 66 demonstrates this to be a viable assumption, but also the exemplary selection of expressions charted in Figure 17. Regions like Central Campeche, Quintana Roo or Hondo with a relative small lexical diversity and large evenness can be

[563] Comparisons made to the overall frequency rely on the figures for those samples attributable to a geographic region with $N_G := |3229|$. These figures may deviate from the overall amount of samples with $N_S := |3890|$ that are attributable to a showcase and whose figures are summarised in Appendix C.1.

expected to follow the 'cross-regional standard' in terms of spelling schemes. But even a few deviations already affect the overall picture in a significant way. But because of their small sample sets, it is dangerous to infer regional preferences. For large sample regions, deviations in the spelling schemes are almost insignificant. This does not mean that certain regions do not feature linguistic characteristics, such as vernacular forms, but these at least comply to an overall orthographic standard.

3.3.5 – Analyses by Temporal Data

Along the temporal analyses, the distribution and significance of the four spellings groups and their schemes is reviewed across subsequent *K'atun* intervals. Similar to the spatial analyses, functional aspects from the analytical showcases are ignored, but also any geographical dimension.

The review on a diachronic basis follows the layout of spatial analyses conducted in Chapter 3.3.4. The first step reviews the frequency of spelling schemes, united by their spelling group attribution. This allows a temporal comparison, the identification of trends and the isolation of significant patterns for individual *K'atun* intervals (Figure 43). The spelling scheme frequency broadly reflects the overall image from Figure 19, but exhibits some intriguing and unusual developments.

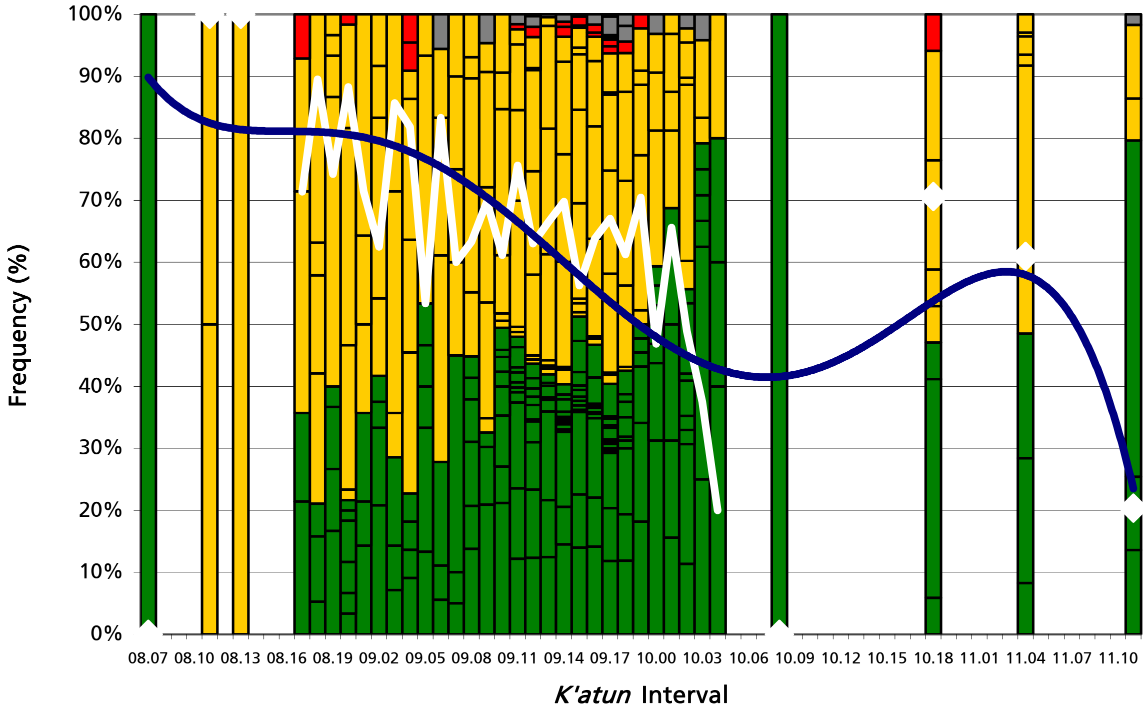

Figure 43: Relative frequency of spelling schemes across *K'atun* intervals with N_T:=|2783|, summarised by spelling groups (1: green, 2: yellow, 3: red , 4: grey) and indicating the overall root morphograph frequency (white line/rhomb) and its quintic polynomial regression (blue line) with R^2 = 0.5759. Sven Gronemeyer.

The significance tests for each interval prove the gross of H_1 for spelling group 1 to be false, while H_0 can be accepted (Table 70, see Appendix C.4 for the full set of data). The intervals of 8.7, 8.11, 8.13, 10.4, and 10.8 have not been included because they do not provide a substantial amount of samples for a significance test. For the range between 8.17 and 9.7, most *K'atun* intervals also provide an amount <30 that ideally is too low, the same is also applicable for 10.3 and 10.18. The majority of these intervals nevertheless provide a clear test result. Spelling group 1 only has H_1 accepted and H_0 rejected with the given significance level in 10.3 and 11.11 (Madrid Codex), with $\alpha = 0.95$, 10.1 can also be included. The *K'atun* intervals of 9.5, 10.0, and 10.18 have no significance for any spelling group. With $\alpha = 0.95$, only 10.18 delivers a result to reject H_1 of group 1 and accept H_0; the tendency is towards group 2 in 9.5, and in 10.0, groups 1 and 2 are equal.

K'atun Interval	Total	Spelling Group 1		Spelling Group 2	
	N_T	n_1	k	n_2	k
08.17	14	5	11	8	8
08.18	19	4	15	15	11
08.19	31	13	22	18	16
09.00	60	13	40	46	27
09.01	14	5	11	9	8
09.02	24	10	18	14	13
09.03	14	4	11	10	8
09.04	22	5	17	15	12
09.05	15	8	12	7	9
09.06	18	5	14	12	10
09.07	20	9	15	11	11
09.08	30	13	22	17	15
09.09	43	14	30	27	20
09.10	85	42	54	43	36
09.11	123	59	76	61	49
09.12	300	131	175	158	110
09.13	218	91	129	126	82
09.14	248	100	146	139	92
09.15	279	143	163	130	103
09.16	304	142	177	151	111
09.17	270	109	158	144	100
09.18	160	68	97	82	62
09.19	44	22	30	21	21
10.00	32	19	23	12	16
10.01	32	22	23	10	16
10.02	88	49	56	37	37
10.03	24	19	18	4	13
10.18	17	8	13	8	10
11.04	169	82	102	87	61
11.11	59	47	39	11	26

Table 70: Significance of spelling groups 1 and 2 across *K'atun* intervals. Parameters $p \approx 0.51$ for group 1 and $p \approx 0.30$ for group 2 with $\alpha = 0.99$ in all cases.

When operating with $\alpha = 0.95$, 10.1 and 10.3 are significant for vowel-providing spellings. The interval of 10.2 in between however is significant for spelling group 2. When reviewing the data provenance, 10.1 has most of its samples from the central lowlands, with only 8 cases (25.0%) from Yucatan. The situation dramatically shifts with 10.2, where now 83 samples (94.3%) originate from Yucatan, with a slight decrease to 83.3% in 10.3, but where the overall cardinality with 20 samples is considerably lower. For 10.4, there are only 5 samples in total, three of which are group 1. While the regional test in Chapter 3.3.4 proves Yucatan to be significant for spelling group 1, the result for the Early Post-Classic is rather mixed. In fact, the intervals of 10.18 (Paris Codex) and 11.4 (Dresden Codex) support the significance of group 2 spellings, while in 11.11 (Madrid Codex), spelling group 1 becomes again significant. A closer review of Yucatan takes place in Chapter 3.3.6.1.

Figure 43 reveals some interesting observations regarding the showcase samples, although up to 9.10, the amount is relatively small (with the exception of 9.0 induced by TIK St. 31). Despite the fact that a significance for spelling group 2 is given for most intervals, the fluctuation of the relative frequency between group 1 and group 2 is considerable before 9.10. Between 9.11 and 9.19, the ratio remains more or less stable, with an increase of spelling group 1 from 10.0 on, while this trend is discontinued with the earlier codices and only reflected again in the Madrid Codex. When the diachronic distribution of the spelling groups is juxtaposed with the overall frequency of lexemes written with a (complemented) morphograph, we can also observe an extensive range of fluctuation. For the time before 9.10, the effect is likely again intensified by the limited range of samples and dilutes in the Late Classic. It is notable to observe that with a continuing significance of spelling group 2, the overall frequency of morphographs is decreasing. The regression is not without some problems, mostly because of the poor amount of samples before 9.10 and the decreasing quantity after 9.18, but also due to the large absence of samples before 8.17 and for the most part of the Late Post-Classic. The regression has its best determination for in the Late Classic, with a lesser goodness of fit for the other periods. The interpolation for the intervals void of any samples is a special problem for the Late Post-Classic and the isolated codices, leaving the polynome with a low determination.

It is also noteworthy to review the ratio between spelling groups 1 and 2 and the proportion of morphographs within spelling group 1[564]. The tendency for spelling group 2 is relatively clear, with almost all *K'atun* intervals reaching 100.0% between 8.17 and 9.8, and dropping to values under 88.0% up to 9.18. Spelling group 1 exhibits a far greater fluctuation, both diachronically and concerning the relative frequency: values ≤20.0% (and thus below the overall mean) appear in 9.2, 9.5, 9.8, 10.0, and 11.11; rates ≥30.0% in 8.19, 9.4, 9.6, 9.14, 9.19, and 10.2; and frequencies ≥50% in 9.0, 9.3, 9.11, 10.1, and 10.18. While some Early Classic intervals have thus a tendency to spell group 1 samples purely by syllabograms, it is evident that more often syllabic signs were only complemented to a morphographic root. This tendency becomes even stronger by the Terminal Classic and Early Post-Classic. With a steady translocation of the writing tradition to Yucatan after the collapse, this development is consistent with the observation made in Chapter 3.3.4. Syllabic spellings increase, but less intense than previ-

[564] Among all showcase samples, the morphographic mean for all spelling groups is 57.2%. From 8.17 and 9.18, the range oscillates between 53.3% in 9.5 and 89.5% in 8.17. From 9.19 on, the mean decreases from 70.5% to 37.5% in 10.3 and ultimately 20.0% in 10.4. The Paris Codex has 70.6%, the Dresden Codex 61.0% and the Madrid Codex 20.3%. Within spelling group 1, the overall sample mean is 21.4%, and 93.1% for spelling group 2. Including the low sample intervals up to 9.18, the fluctuation for group 1 ranges between 10.0% in 9.2 and 53.8% in 9.0, for group 2 between 87.5% in 9.17 and 100.0% in 8.17, 8.18, 8.19, 9.1, 9.2, 9.3, 9.5, 9.6 and 9.8. After the Classic, the range for group 1 is between 15.8% in 10.0 and 54.5% in 10.1, for group 2 between 36.4% in 11.11 and 100.0% in 10.0.

ously assumed (cf. Wichmann 2006b: 289-290, fig. 2). More significant is the amplified use of complemented morphographs that during certain times is applicable to more than every third sample.

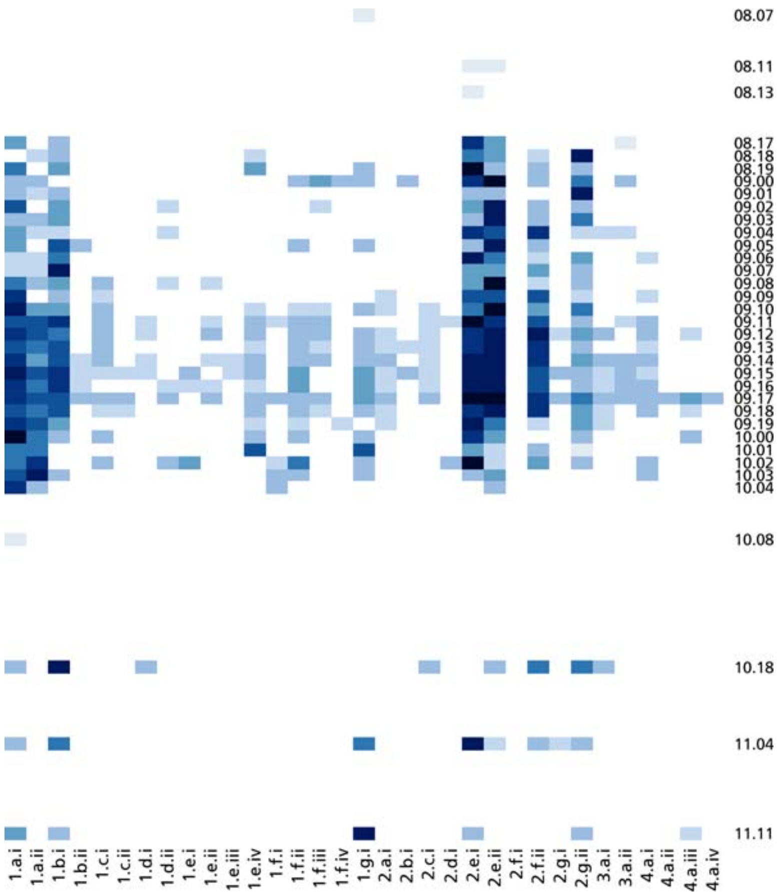

Figure 44: Heatmap of spelling scheme frequencies across *K'atun* intervals with N_T :=|2783|. Sven Gronemeyer.

While Figure 43 provides some clues regarding the variability of spelling schemes, a frequency distribution chart (Figure 44) provides a clearer image. Frequent spelling patterns, such as 1.a.i, 1.a.ii, 1.b.i, 2.e.i, 2.e.ii, and 2.f.ii, the overall image is also confirmed from a diachronic point of view, as these schemes act like the writing system's backbone. Their use is largely independent from the suffix function and analytical showcase (Figure 21), the regional distribution (Figure 42), and the temporal development. While the spelling scheme distribution for the suffix functions shows certain configurations and preferences, the regional patterns are harder to determine. In the diachronic view, several patterns can be observed that concern the evolution of the writing system as a whole, independent from the suffix function, phonology, and harmony patterns, or the geographic applicability.

The spelling schemes have their highest variability between 9.10 and 9.17, the time frame that also generally finds the biggest lexical diversity and highest cardinality of samples (Figure 18 and Table 67). A reduced set of schemes attested in the *K'atun* intervals before 9.10 is simply the result of the source situation with lesser samples, as demonstrated by 9.0 with its higher cardinality and broader scheme range. The tendency until the beginning of the Late Classic definitely is to use just morphographic root spellings of groups 2 and 3, although the latter is scarce before 9.10. If syllabic or complemented morphographic root spellings are used, they are significantly lower in number and are largely restricted to synharmonic roots (with schemes 1.a.i, 1.a.ii and 1.b.i). Interestingly, the achievements of the fully developed writing systems with its numerous way to spell are largely discontinued in the epigraphic record with and after the collapse.

This is only partly related to the showcase selection, but again induced to the source situation with a lower amount of samples and reduced lexical diversity. If there was a tendency to write more with syllables or at least by phonemic complementation, we would find more group 1 spellings outside schemes 1.a.i, 1.a.ii and 1.b.i. But the decrease of 1.b.i spellings shows or even more the continuing use of 1.f.# schemes of suffixes in second position after the root signals that certain lexical classes and roots (e.g. derived transitives with a *–C-aj* passive) were used more frequent than other words. Other trends are the result of multiple shifts. The reduction of 2.e.ii samples is the consequence of an increased use of vowel harmonic suffixes with morphographs rather than an orthographic shift from disharmonic spellings, as the individual showcase analyses in Chapter 3.3.3 demonstrated. That suffix disharmonic spellings were still used in the Early Post-Classic is testified by the unbroken presence of 1.a.ii spellings.

Some specific spellings schemes deserve a more detailed review, as far as their diachronic and quantitative arrangement in the matrix is concerned. Collocations that involve a morphograph to (over)spell one or two morphemes in a first or second position after the root as schemes 1.e.iv or 1.f.iv are of special interest. For the 1.e.iv spellings[565], 40 dateable samples (1.4%) are gathered. In 8.18 and 8.19, 4 cases are attested, before the next examples originate again from 9.10, then until 10.1 with a varying frequency. 6 samples come from 9.15, 5 from 9.17 and 9.18, but in relation to the overall sample amount, they are not very incisive, only the 6 cases in 10.1 mark 18.8%. Only 3 samples of 1.f.iv are attested[566], originating from 9.0 and 9.18. In relation to the total interval sample amount, these spellings are a bit more accentuated in the Early and Terminal Classic / Early Post-Classic, but in total, they feature not real significance. There was no systematic development to use morphographs as phonemic signs (see footnote 25).

Scheme 1.g.i, the omittance of the suffix grapheme with provision of the suffix by the root spelling is especially interesting. 144 samples (5.2%) are dateable and can attributed to a broad variety of showcases[567]. Their application intensifies from 9.15 with special significance in the codices. Scheme 1.f.i, the underspelling of a suffix grapheme in second position is quite rare, with only 10 samples[568]. Also because of its significance for linguistics, scheme 1.g.i for showcases 1PASS and 2IND is scrutinised in Chapter 3.3.6.2. The complete underspelling of a suffix by scheme 2.g.ii also shows a development that may correlate with the evolution of the writing system. In relation to the overall frequency,

[565] Attested are: =**AJ** < *CVC-aj*, =**TAJ** < *CVt-aj*, =**AL** < *CVC-al*, =**NAL** < *CVn-al*, and =**JUL** ~ =**HUL** < *CVh-ul*. Thus far, only 1PASS, 1INCH, 1ATTR, 3NMLS, and 4TEMP showcases appear with this scheme. The suffix morphograph can directly follow a morphograph or a phonemic complement. The suffix morphographs are also frequently complemented.

[566] One examples is not dateable, attested are: =**NAH** < *CVC-n-aj* and =**JAL** < *CVC-j-al*, i.e. for showcases 1PASS and 1INCH.

[567] These are in order of precedence: (1) 2IND – 68; (2) 1PASS – 32 ; (3) 1INCH – 15; (4) 2ANTIP – 13; (5) 4TEMP – 7; (6) 1ATTR – 5; (7)1MED, 2MED, 3INSTR, 3NMLS – 1.

[568] Of which 5 are datable, attested are in order of precedence: (1) 1PASS – 8, (2) 1MED, 4 TEMP – 1.

underspellings are more relevant in the Early Classic (with up to 26.8% in 8.18), although they appear with a proportion of 6.3% in 9.17 and 9.18 as well, rising to 17.7% in 10.18 and 11.9% in 11.11. For the Early Classic, the higher significance may relate to the progressive introduction of syllabograms to indicate grammatical morphemes, while for later times, it may indicate a tendency to abbreviate spellings.

In conclusion, a diachronic review of spelling schemes offers more insights than the spatial analysis. As the regional investigation is independent from a temporal dimension, the lower amount of samples from earlier and later times gets clouded by the gross of samples from the Late Classic. In contrast, the temporal serialisation of spelling schemes is more suitable to determine patterns. When considering isographs (see Chapter 4.2.6), these are probably more determined by time than space. But notable deviations among the schemes are again more determined by the source situation in each *K'atun* interval. As far as the showcases are concerned, the amount of samples in the Early Classic and after the collapse is still too light to arrive at a comprehensive range of spelling practices. Intervals of low sample frequency and lexical diversity (Table 67) should not be taken too significant in the overall picture, despite their value in providing valuable samples to illustrate orthographic practices.

3.3.6 – Combined Analyses

The previous chapters focused on the analyses of the subsets for suffix functions, geographic regions, and spatial distribution alone, noting specific patterns that require a more granular approach with a combination of different parameters. The analyses here are thus subsets or intersections of the sets determined by showcase, region, or time.

3.3.6.1 – Diachronic/Functional Spelling Group Significance in Yucatan

Chapter 3.3.4 identified Yucatan to be the only region to provide acceptance for spelling group H_1, although H_0 is not falsified. As the temporal analyses identified several *K'atun* intervals with a strong or sole relation to Yucatan to be significant for vowel-providing spellings, a first test reviews Yucatan from a temporal perspective (Table 71).

Period	N_S	n_1	k	n_2	k	n_3	n_4	N_M (%)
08.13-09.08 (Early Classic)	3	2	3	1	3	0	0	50.00
09.09-09.14 (Early Late Classic)	21	11	16	10	11	0	0	72.67
09.15-09.18 (Terminal Late Classic)	42	30	29	11	20	1	0	33.30
09.19-10.08 (Early Post-Classic)	130	80	80	47	52	0	3	19.93
10.09-11.11 (Late Post-Classic)	245	137	144	106	91	1	1	50.63

Table 71: Spelling group frequencies and significance test for time periods in Yucatan with $N_{G(YUC)}$:=|441|. Parameters $p \approx 0.51$ for group 1 and $p \approx 0.30$ for group 2 with $\alpha = 0.99$ in all cases.

In order to avoid empty or low sample amounts for the significance tests among *K'atun* intervals, five major periods are established. The Early Classic is too insignificant for a reliable test result, and the Early Late Classic does not deliver any significance for one of the spelling groups, although with a significance level $\alpha = 0.95$, spelling group 2 becomes significant. For the Terminal Late Classic and Early Post-Classic, spelling group 1 is barely significant, at the same time rejecting its H_0. For the Late Post-Classic, comprising solely of the codices, it is again spelling group 2 to be significant.

For the Terminal Late Classic, Yucatan's share in the overall number of samples is just 4.2%, and Yucatan thus deviates from the general predominance of spelling group 2. For the Early Post-Classic, Yucatan contributes 57.5% of all samples; from 10.2 on, almost all examples. Although the overall frequency of morphographs drops to a minimum, supporting the tendency to write more with only syllabograms, the significance for spelling group 1 remains at the edge of acceptance. The Late Post-Classic reverts the trend, despite the fact that the Madrid Codex has a strong significance for spelling group 1, but its sample proportion is too low, especially when compared to the Dresden Codex.

When from a temporal perspective only the periods between 9.15 and 10.8 (and the interval of 11.11, when isolated from the period) allow the acceptance of H_1 for spelling group 1, how do the showcases contribute? When only two out of five time periods prove group 1 to be true, then it is most likely the showcase distribution (Table 72) that triggers the result for Yucatan as a whole.

Showcase	N_S	n_1	k	n_2	n_3	k	n_4	N_M (%)
1PASS/1MED	198	129	118	67	-	75	2	42.93
1INCH	29	29	21	8	-	15	1	82.76
1ABSL	2	0	2	2	-	2	0	100.00
1POSS	2	0	2	1	-	3	0	100.00
1ATTR	33	11	24	22	-	16	0	81.82
2IND	96	48	61	48	-	40	0	47.92
2ANTIP	29	27	21	2	-	15	0	10.35
2MED	15	4	12	11	-	9	0	80.00
2COM	1	0	1	1	-	1	0	0.00
3INSTR	16	15	13	0	0	4	1	0.00
3NMLS	2	0	2	0	2	1	0	100.00
4TEMP	42	25	29	17	-	20	0	42.86

Table 72: Spelling group frequencies and significance test for showcases in Yucatan with $N_{F(YUC)}$:=|466|. Parameters $p \approx 0.51$ for group 1, $p \approx 0.30$ for group 2, and $p \approx 0.06$ for group 3 with $\alpha = 0.99$ in all cases.

For the analytical showcases, Yucatan imparts some surprising test results deviating from the overall pattern. Spelling group 1 is confirmed by 1PASS/1MED, 1INCH, 2ANTIP and 3INSTR; spelling group 2 is found significant with 1ABSL, 1ATTR, 2IND, 2MED, 2COM, and 3NMLS; no significance can be made out for 1POSS and 4TEMP. While 1POSS is too small, a lowered significance level of $\alpha = 0.95$ still provides no significance for 4TEMP, but the tendency is towards spelling group2.

It is surprising to find case 2ANTIP significant for group 1, but one factor is decisive: of the 11 lexemes attested, a morphograph has been developed for only two of them. Likewise, showcase 1ATTR, found here significant for spelling group 2, deviates from the general pattern by showing a narrow lexical diversity with only two roots, for one of which a morphograph exists that is made heavy use of. Notable is also the comparatively (numeric) prevalence of 2IND and 4TEMP among spelling group 1, although not reaching a significance.

In sum, the factors to cause Yucatan to be significant for spelling group 1 are diverse, and the accumulation of little effects ultimately tips the scales. The following factors contribute: (1) changes and shifting emphases in rhetorics with a strong presence of passive forms, (2) an increase of words barely used in the Classic and for which no morphograph was thus developed, (3) an increase in phonemic complementation and syllabic root spellings, although alone in certain time intervals and/or showcases not significant enough, and (4) a clear preference for a syllabic orthography (with underspellings) in the Madrid Codex which is more a clear cut than a development with respect to the source situation.

The codices as a source category deserve a final comment in this respect. The significance for spelling group 2 at least in the codices of Dresden and Paris may contribute to the question of the codical text tradition from earlier sources (see footnote 118). Together with linguistic traits pointing out the primary Ch'olan influence (e.g. Wald 2004a), the graphematics of the codices in some ways opposes the trends observed elsewhere in Yucatan, although the codices remain temporally and materially isolated. The orthographic difference of the Madrid Codex could thus be indication that it depends less on an archetype and thus reflects more the development of the writing system. Some of these questions will be touched on again in the next chapter and the discussions of Chapter 4, but a systematic investigation is beyond the scope of this study.

3.3.6.2 – Diachronic/Spatial Distribution for Selected Showcases/Schemes

The individual analyses of the showcases have indicated that some patterns observed along the spelling scheme distribution that may depend on regional and temporal preferences. While the immediate implications are orthographic, some of these data may also be the result of the historical configuration not only of Classic Mayan, but also vernacular languages. Other linguistic implications (see Chapter 3.4) important to identify language change and geography may still be clouded behind regular spelling schemes or are independent at all from a specific orthography. Such cases are not a concern of this chapter, but are scrutinised in the discussions of Chapter 4. The main objective here is to determine whether the data substantially support a linguistic or epigraphic hypothesis, not to discuss it.

The cases to be discussed here also serve as demonstrative examples to carve out small-scale regional or temporal preferences. The region-wide and diachronic analyses in Chapters 3.3.4 and 3.3.5 only considered differences in spelling patterns on a macroscopic level, with the totality of suffix functions. The conclusions demonstrated that differences in these patterns largely result from the individual sample subset size, lexeme diversity, and rhetorics; and in terms of constant suffixation patterns, the differences are neglectable. Marginal development occasionally drown in the overall picture, but granular investigations may help to identify regional or site-specific peculiarities which may be summarised as a scribal school. A temporal dimension could trace the development of such a school and even identify certain masters (even more when adding other parameters, such as the sign classification, see footnote 123). As this study is more concerned to work out the broad consensus for an orthography in the writing system "[i]n search of the perfect orthography" (Venezky 2004), such isolated developments can only marginally be touched.

The analyses conducted here thus comprise of narrow sets constrained by the following parameters: (1) showcase, (2) region, (3) period, and if necessary (4) one or more spelling schemes. The data analysis will be conducted by a frequency distribution chart. If a sample clustering is discernable, an additional significance test takes place, if applicable or necessary[569].

(1) *Showcases 1PASS/1MED and 1INCH*: As the analyses in Chapters 3.3.3.1.1 and 3.3.3.1.3 pointed out, the spelling schemes 1.g.i and 1.f.i with **Ca=Ø** may not just indicate an underspelling *–a[j]*, but indeed be either the result of sound change to simply *–a* or indicate an allomorph *–a / __#*. Especially for the passive and mediopassive, the debuccalisation process would be an important trait for ECh vernaculars. The test reviews a temporal development, especially for the south-eastern regions.

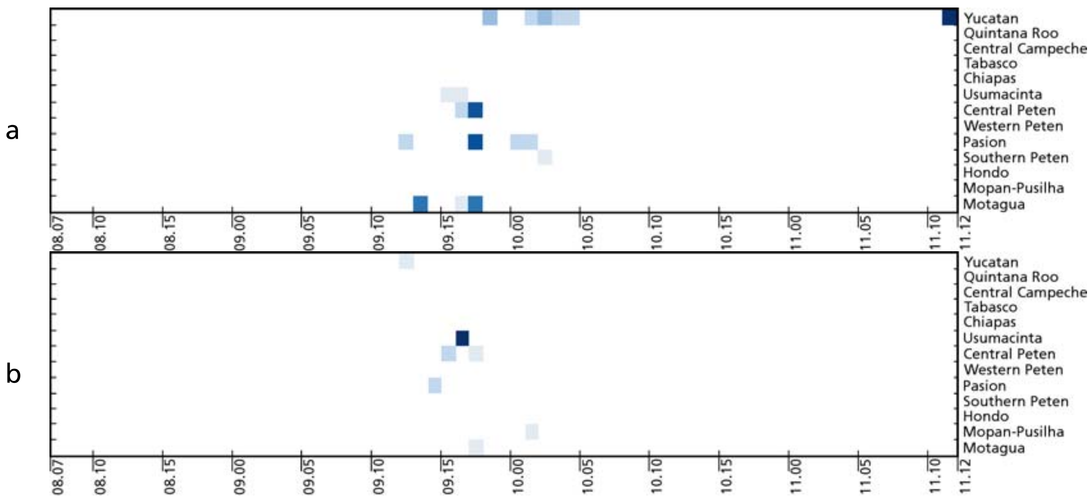

Figure 45: Heatmap of selected showcases with spelling schemes 1.g.i and 1.f.i in diachronic and spatial distribution. **a)** For 1PASS/1MED with N_S :=|42|, **b)** for 1INCH with N_S :=|15|. Sven Gronemeyer.

The distribution chart (Figure 45) does not testify any systematic pattern to prove a correlation between the (reconstructed) phonology and a graphematic reflection. Of course, no pattern does not mean that the linguistic assumptions are incorrect. A more detailed review and debate is subject to Chapter 4.1.1.

For 1PASS/1MED, there are only five samples in the Motagua region which should be the region to feature ECh traits, for 1INCH only two in the south-eastern regions. Stronger for both showcases is the clustering in the southwestern periphery, especially the Usumacinta

[569] In order to determine the critical value *k*, the following test parameters need to be redefined: let *n* be the statistical population of a cluster (regional/temporal) for the showcase, but regardless of the spelling scheme, let *p* be the quotient of the schemes investigated to all schemes, and let *X* be the actual number of samples counted in the cluster.

and Pasion region with some additional examples from the Central Peten, mostly dating between 9.13 and 9.18 (8 samples for 1PASS/1MED, 11 for 1INCH). The Pasion and Southern Peten have three Early Post-Classic 1PASS examples. The loose clustering mentioned could simply reflect the bigger spelling scheme diversity due to a larger amount of samples known from the Terminal Late Classic and is not necessarily the result of a regional development[570]. Taking all 9.9-9.18 Late Classic 1PASS/1MED samples together ($n = 526$), 1.g.i and 1.f.i schemes are insignificant with $k = 45$ (with $p \approx 0.06$ and $\alpha = 0.99$) for the 15 samples attributable to a *K'atun* interval and region.

Yucatan shows two clusters, one in the Early Post-Classic with five examples, and one with 14 samples from the Madrid Codex, all of which are scheme 1.g.i. When compared to all passive examples from Yucatan ($n = 198$), the amount for this scheme is significant with $k = 12$ (with $p \approx 0.03$ and $\alpha = 0.99$). The Yucatec provenance is even less support for a reflection of ECh language change.

(2) *Showcase 2IND*: The linguistic review of the transitive status marker in Chapter 3.1.3.1 indicates it to be $-V_1$ rather than $-V_1w$ for root transitives, with $-V$ for derived and non-CVC transitives. Spelling scheme 1.g.i with **CV=Ø** may thus be a dedicated indication instead of applying =**wa** as a graphemic marker, especially for derived transitives. The chart also includes samples that may be interpreted in favour of $-V$ vernacular forms or $-V_1$ subjunctive status, pending linguistic discussion. The charting pursues to find patterns and find significances (Figure 46).

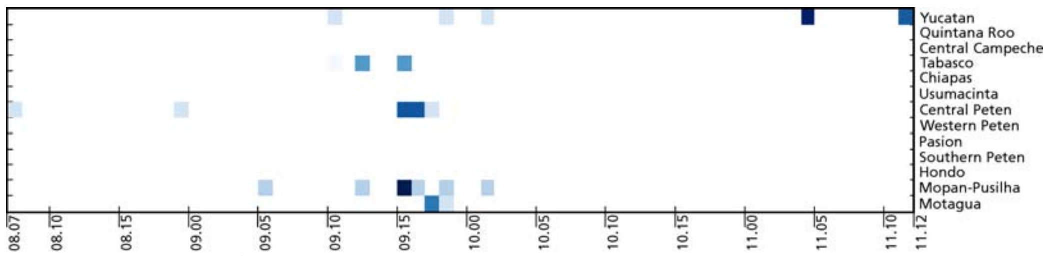

Figure 46: Heatmap of 2IND with spelling scheme 1.g.i in diachronic and spatial distribution with N_S :=|77|. Sven Gronemeyer.

No clear clustering is visible, although the Mopan-Pusilha region seems to have a stronger preference with six samples in the Late Classic between 9.9 and 9.18. Generally, most examples concentrate in the Late Classic across all regions, thus likely only reflecting a larger spelling scheme diversity among a more substantial sample set from this time period. Taking all regions together, there are 24 Late Classic 1.g.i samples. With an overall amount of

[570] For example, the Usumacinta cases distribute as follows (1PASS/1MED and 1INCH combined): for 9.15, 1 sample from PNG P. DOAKS1, for 9.16, 7 samples from YAX Lnts. 2, 3, 6, 16, 32, 33, and 42. The Yaxchilan lintels were all dedicated by *Yaxun Bahlam* IV, some of them being part of the same architectural programme (such as Lnts. 2 and 3 in Str. 33, Lnts. 32 and 33 in Str. 13 [cf. Graham and von Euw 1977: 6-7]), and their samples only consist of 1 case with *chuk* and *ahk't-aj* for the remaining six. This is hardly of regional significance, but only the result of a local scribal preference at a certain time.

$n = 201$ for this period, $k = 12$ (with $p \approx 0.03$ and $\alpha = 0.99$)[571], thus this scheme alone is at least not insignificant, although comprising only 11.9% of all Late Classic plain status examples.

Of special importance are the codical examples, with 24 from 11.4 and 15 from 11.11. Even among all 2IND samples ($n = 367$), these 39 attestations are significant with $k = 19$ (with $p \approx 0.03$ and $\alpha = 0.99$). This is still true for the Dresden Codex alone, while the Madrid Codex would fail a significance test (although both would pass for Yucatan alone with $k = 7$), also compare to the amount of 1.g.i spellings for 1PASS. Of all 43 Yucatan examples, 20 are CaC roots, where an underspelling may leave the reader to choose between a ClM *–a* or pYu *–a[j]* reading; but for all others with a $-V_1$ suffix, a pYu form cannot account for these[572]. In comparison with 1PASS/1MED, the underspelling rather appears as a codical convention for a mere $-V_1$ suffix (as already supported by the Late Classic examples). At the same time, this implies that the scribes of the codices were still mastering ClM as a written vernacular. The linguistic implications are discussed in Chapter 4.3.4.1.

(3) *Schemes 2.a.i, 2.b.i, 2.c.i, and 2.d.i*: Vowel-indicating spellings of the first four sub-schemes of spelling group 2 were discussed in connection with morphosyllables (Houston, Robertson and Stuart 2001b: 23). They are supposed to indicate the signal "the sign-class boundary between syllabic signs […] and their morphosyllabic companion […]", thus also the border between free and bound morphemes. Emphasising the unattached root spelling, such spellings are expected to occur regularly in comparison with the corresponding schemes from spelling group 2. The diachronic distribution charting across all regions for all analytical showcases (Figure 47) seeks to answer how often these schemes were applied.

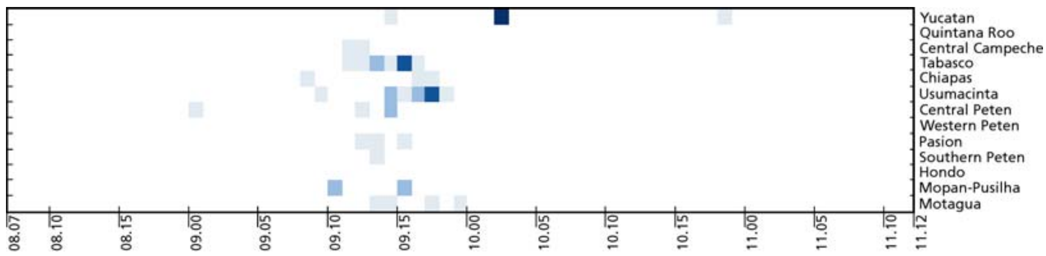

Figure 47: Heatmap of all showcases with spelling schemes 2.a.i, 2.b.i, 2.c.i, and 2.d.i in diachronic and spatial distribution with N_S :=|50|. Sven Gronemeyer.

Following the argumentation by Houston, Robertson and Stuart, schemes 2.e.i and 2.e.ii would also account for morphosyllabic spellings. These are abundantly attested, but do not account to syllabic or complemented spellings, which among spelling group 1 are significant

[571] Ideally, eight additional examples of a total of nine of unknown *K'atun* interval could be added to 24 datable, as these securely date to the Late Classic. Among the datable samples, only two with *it-a* do not comply to a CVC shape, the additional eight Late Classic examples are either *it-a* as well, or the derived transitive *tz'ihb-a*.

[572] For the Madrid Codex, 1.g.i is the exclusive 2IND spelling pattern, while in the Dresden Codex, 43 samples follow a spelling other than 1.g.i. Compare to 1PASS, where schemes other than 1.g.i still occur in the Madrid Codex.

for several showcases (Figure 21). Some of the schemes have a strong presence in all regions (Figure 42) and over time (Figure 44), including those that purposefully alter the root spelling to provide the suffix vowel. The same distribution charts mentioned already demonstrate little relevance for these group 2 spellings. Among the showcase samples attributable to both a region and a time period, only 50 account to synharmonic or disharmonic patterns not providing the suffix vowel, with $k = 372$ for the totality of samples ($n = 2762$) and $k = 195$ only among spelling group 2 ($n = 1375$, each with $p \approx 0.12$ and $\alpha = 0.99$). Such spellings are insignificant and do not provide support for the morphosyllabic model.

When reviewing the distribution patterns, it is evident that the four spelling schemes in question only have scant attestation before and after the Late Classic from 9.9 to 9.18. The broader attestation in this period is proportional to the general increase of samples[573]. Although Tabasco and the Usumacinta region show some more examples, no true patterns are observable. The latter region has some preference among 1PASS for these schemes, with eight out of a total of ten, but compared to the overall amount of Usumacinta 1PASS samples ($n = 126$), the quantity is insignificant with $k = 24$. In terms of the showcase distribution, no pattern is observable either[574]. The mentioned spelling group 2 schemes will appear again in the individual showcase discussions of Chapter 4.1 and in Chapter 4.2.5.3 among the epigraphic evaluation of harmony patterns and morphosyllables.

(5) *Schemes 1.e.iv and 1.f.iv*: In footnote 25, it was noted that morphographs can also act as phonographic signs, and Chapter 3.3.5 investigated their temporal distribution, finding no systematic pattern. It is apt to review the distribution of such spellings again including a spatial dimension. Schemes 1.e.iv for a primary and 1.f.iv for a secondary suffix position account to a phonographic morphograph application in the suffix domain. The diachronic charting across all regions for all analytical showcases (Figure 48) details the distribution of these schemes.

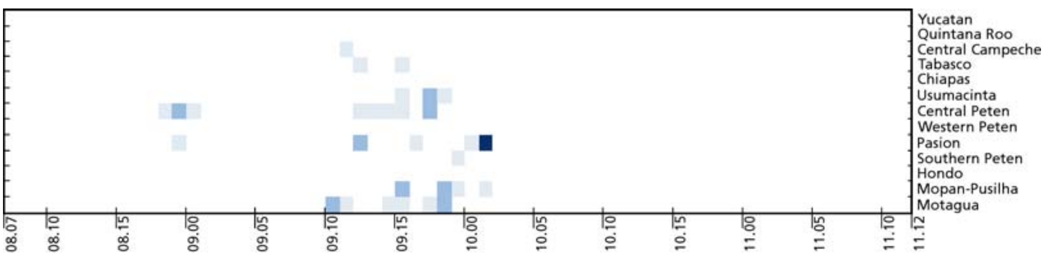

Figure 48: Heatmap of all showcases with spelling schemes 1.e.iv and 1.f.iv in diachronic and spatial distribution with $N_S := |42|$. Sven Gronemeyer.

[573] Furthermore, if these spellings were specifically used to act like 'morpheme separators' between the root and the suffix, their temporal distribution would imply that morphosyllables were not commonly used before the Late Classic period – and neither afterwards, vanishing with the collapse.

[574] The 50 samples distribute as follows: 1PASS – 17, 1POS – 3, 1INCH – 8, 1ABSL – 9, 2IND – 4, 2ANTIP – 3, 2COM – 1, 3INSTR – 4, 4TEMP – 1. The four 2IND examples are all with *il-a* from Chichen Itza.

No clear pattern is detectable. The Early Classic conglomeration only counts five samples. The gross distributes in the Terminal Late Classic between 9.9. and 9.18, with nine samples found in the Early Post-Classic. The samples appear with five different showcases[575]. For the Late Classic, the Motagua region counts the most samples, with nine in total. Apparent is also the increase of Early Post-Classic spellings in the Pasion region with six samples, all except one with *k'uh*, which in total marks 14 cases alone. As it seems, the overall distribution pattern is again the mere reflection of a broader spelling scheme variety along with a larger sample set during the Late Classic.

However, notable is the absence of samples in Quintana Roo and Yucatan, which may be related to the increase of 1.g.i spellings, at least as shown for 1PASS and 2IND. If there was a spread in underspellings for Post-Classic Yucatan, the use of morphographs as phonographs is a contrary principle. With some examples for the Early Classic, the process was apparently the opposite: morphographs were possibly used in the suffix domain as an alternative to 2.e.i and 2.e.ii schemes, before the use of syllabograms became widely established. Schemes 1.e.iv and 1.f.iv then remained in the orthographic inventory as a somewhat 'archaic' option, and eventually became abrogated with the spread of syllabic spellings. This development would be in accordance with the decrease of spelling scheme variability, as best seen in the codices. However, the assumption must remain tentative, as the Early Classic has only a far smaller corpus to provide evidence, which is likewise the apparent explanation for the Early Late Classic gap. The distribution pattern has to remain a snapshot, as another aspect ramifies the impression from the corpus.

As it is outside the scope of this study, no consideration of samples takes place, where a morphograph is applied as part of the root (e.g. **NAH-wa=ja**, < *na<h>w-aj*, PAL T18S, A5 or **K'UH-tzi** < *k'uhtz*, C Dr. 15a). Strictly speaking, the cases of heterographic homophony, as for example described with *chan* by Houston (1984), would also account. Although the signifier is detached from the signified in a morphograph (see for example the use of YG5 **AK'** for spelling both *a[h]k'(o)t* and *ak'*, also see footnote 19), Maya writing still exhibits a fair correlation between signifier and signified, which is at least 'mentally' overwritten by the 'rebus' writing.

Provided here are only some prominent distribution analyses, focusing on general showcases and specific spelling schemes. The analyses above also serve to exemplify how specific questions are pursued in the epigraphic and linguistic discussion of Chapter 4, when specific data sets need be queried from the data base. Certainly not all possibilities are explored and attribute permutations investigated in this chapter, nor is it necessary.

[575] See footnote 565 for the suffixes known. The 42 samples distribute as follows: 1PASS – 6, 1INCH – 12, 1ATTR – 13, 3NMLS – 1, 4TEMP – 1.

3.3.6.3 – Harmony/Disharmony Pattern Preferability

Chapter 3.3.1 pointes out the necessary arbitrariness of suffix harmony patterns determined by the root vowel, the suffix vowel and the syllabogram chosen for constant suffixation. As discussed at several occasions in connection with the linguistic hypotheses (see e.g. footnotes 311 and 479), the inevitable juxtaposition of synharmonic and disharmonic spellings is less induced by linguistic reasons. While we observe the principle of constant suffixation with a fixed-vowel syllabogram in most instances (e.g. 1PASS, 2IND), semi-constant (as with 2ANTIP), harmonic (as with 1ATTR), and semi-harmonic (as with 3INSTR) patterns are also visible, up to a variable pattern (as possibly with 2COM). Graphematic options are present, if it were the scribes' intention to avoid inconsistent or shifting harmony patterns in writing, and if these were following rules to indicate a vowel quantity.

Even though harmony pattern changes are graphematically conditioned, the Maya scribe might have sought to avoid such cases, as proposed in footnote 531. One way to achieve this would be the appliance of different diatheses in a verbal context (cf. Matsukawa 2009). This chapter further reviews the question as an exemplary case for CaC versus other CVC roots for 1PASS and 2IND. Were CaC transitives more often written in passive form with =**ja** or in indicative form with =**wa** for a harmonic suffixation pattern? Or were other CVC roots preferred to be passivised with an altered root spelling or do they largely remain transitive for a disharmonic suffixation pattern?

Only verbs are included that follow the inflection and derivation of CVC roots, as non-CVC and derived transitives passivise with a *–C-aj* suffix chain, and the second position thematic does not interact with the root spelling. When investigating the harmony patterns between the root and the suffix, several spelling schemes need to be ignored, constraining to those that indeed spell with =**ja** / __# and =**wa** / __#, which the showcase analyses in Chapters 3.3.3.1.1 and 3.3.3.3.1 demonstrated to be the almost exclusive pattern.

Showcase 1PASS counts 784 samples in total across all spelling groups, of which 416 are CaC roots (53.1%). When only spelling group 1 is concerned where there is actually a harmony pattern with **Ca**=**ja** / __#, then 361 samples remain, of which 202 are CaC roots (25.% of total, 56.0% of spelling group 1)[576]. Showcase 2IND counts 285 samples in total across all spelling groups, having 191 CaC roots (67.0%). When considering only spelling group 1 samples with **CV**$_1$=**wa** / __#, then 97 remain with 65 samples of a CaC root (22.8% of total, 67.0% of spelling group 1)[577].

The proportion of CaC roots is slightly higher with 2IND, and in all instances it remains relatively stable irregardless of the spelling group restriction. For CaC roots, 25 different lexemes occur, but only five are shared by both showcases. Based on the overall figures, an even distribution of samples for any root vowel is 157 samples for 1PASS and 57 for 2IND, a statistical significance for any root

[576] These 202 samples distribute among 19 lexemes as follows: *ch'ak* – 18, *jas* – 1, *jatz'* – 3, *k'al* – 36, *k'as* – 1, *mach* – 3, *mak* – 15, *nab* – 2, *naw* – 19, *pak'* – 2, *pas* – 9, *pat* – 1, *saw* – 1, *tzak* – 1, *tz'ak* – 4, *tz'ap* – 77, *tz'ay* – 1, *yal* – 5, *yatz'* – 2.

[577] These 65 samples distribute among 11 lexemes as follows: *ak'* – 24, *al* – 3, *ch'ab* – 1, *ch'am* – 1, *mak* – 3, *nak* – 1, *pak'* – 2, *pas* – 1, *tap* – 1, *tz'ak* – 2, *tz'ap* – 26.

vowel is reached with $k = 183$ for 1PASS and $k = 73$ for 2IND (with $p \approx 0.20$ and $\alpha = 0.99$). In all cases, the amount of CaC roots is significantly higher.

Of the 219 lexemes associated with showcase samples, 122 are root transitive verbs, although not all of them either have 1PASS or 2IND examples. Of these, 12 have an unknown root vowel, and 40 lexemes are of CaC shape. If the root vowels were evenly distributed, each would count 24 lexemes, a specific root vowel would become significant with $k = 35$ (with $p \approx 0.20$ and $\alpha = 0.99$). Whether the significance of CaC transitives bases on the sampling or is indeed a lexicographic fact cannot be answered by the data.

At least as root transitive verbs are concerned, harmonic patterns with the preferred suffixation of =**ja** / __# and =**wa** / __# are not mirroring a preference for deliberate alterations of the verb's diathesis, the majority of CaC roots only reflects their preponderance in writing (and possibly in the lexicon). Any disharmonic pattern that for example occurs with 2IND with any other root vowel than /a/ is thus owed the simple fact of constant suffixation with one syllabogram indicating the suffix and its function on the graphematic level.

From a statistical point of view, disharmony in the suffix domain, as proposed by Lacadena and Wichmann (2005b) cannot necessarily support any implications for an underlying phonology. This is certainly true for all cases. The question is further discussed in Chapter 4.2.3.

3.4 – Analyses Conclusions

IN PARALLEL TO THE LINGUISTIC HYPOTHESES, an intermediate summary of the statistical analyses of Chapter 3.3 will provide some tentative conclusions. Along the current state of research that led to the showcase definition outlined in Chapter 2.1, this summary compares the insights gained with previous evidence and assumptions. It is also the intent to evaluate the analysis results with the desiderata formulated in Chapter 1.4. It is furthermore apt to review the statistical methodology (while the data collection process was already reviewed in Chapter 3.3.1), as well as some of the analytical constraints and factors mentioned in Chapters 2.5.3 and 2.5.4 (while these aspects are reiterated in the discussions of Chapter 4).

Chapter 3.2 touched the relation between the linguistic hypotheses and the definition of spelling schemes and orthographic paradigms. The statistical tests are supposed to provide facts that support the orthography derived from the linguistic hypotheses. In case they do, there is clear support for the linguistic postulate and for orthographic principles. The validity of the statistical tests stands and falls with a methodologically transparent process of spelling scheme attribution mirroring the linguistic assumptions.

3.4.1 – Statistical Analysis Conclusions

Can the statistical analyses deliver valid results without being biased by the projection of assumed linguistic foundations in the spelling scheme? The answer is largely yes. Up to a certain degree, there is always an inherent fuzziness, as outlined in Chapter 2.5.3.2. If the steps for a source immanent analysis (Chapter 2.3.2), i.e. the morphological segmentation and analysis, would not be possible or doubtful, then any attempt to decipher a hieroglyph and determine affix functions would be futile. More than 60 years of epigraphy after Knorozov's (1952) initial breakthrough have provided a substantial agreement on how to read and understand Maya writing. It is valid to apply a linguistic model to a spelling, analyse it and assign the matching spelling scheme. And 'schemes of doubt' have been prepared, if any uncertainty prevails – although 'firm' cases may still be subject to debate – which is the aim of the discussions in Chapter 4.

Several key points can be addressed regarding the statistical methodology in relation to the objectives of this study:

(1) *Spelling scheme definition*: When conducting the statistical analyses and interpreting the results, one must be aware that the general spelling scheme definition and the specific sample attribution have two intertwined informational levels.

(a) *Linguistic level*: The connection to the underlying linguistics, especially the subject of this study, the vocalisation of the suffix vowel, is simply a binary relation. A spelling is either fully phonemic and vowel-providing, or it is not: this is the basic separator between spelling group 1 and spellings groups 2 and 3. A spelling is considered vowel-providing when it contains a root-final syllabogram with the vowel as predicted by the linguistic hypothesis and a complementary suffix syllabogram. The spelling group attribution is therefore a straightforward decision process, fulfilling the linguistic assumption, regardless of it is true or not, as it is not the spelling scheme's function to decide that. A multi-tier analytical workflow has to ultimately decide this, and of which the statistical significance test is one step, and the discussion another.

(b) *Epigraphic level*: The subdivision into a spelling scheme is to some extent decoupled from the linguistics, but principally encodes the interconnection between the root spelling and the suffix spelling: if necessary and possible, it indicates the root's harmony pattern, whose determination comes from unattached spellings. More importantly, it marks the (reconstructed) harmony pattern between the suffix vowel its syllabogram, which again is based on the linguistic hypotheses. Otherwise, the same conditions apply as for the first decision to which spelling group the spelling is assigned.

Technically, the spelling scheme is an empty descriptor that only becomes meaningful when attributed to a specific sample in connection with an analytical showcase. Within a showcase, one spelling scheme subsumes all samples with the same characteristics, regardless of their actual reading and pronunciation, e.g. scheme 1.a.i for 1PASS is nothing else than **CVC-Ca=ja / CV-Ca=ja** and for 2IND solely **CaC-Ca=wa / Ca-Ca=wa**.

(2) *Statistical figures*: The display of relative frequencies is firstly nothing more than a statement of how often a specific permutation of grapheme combinations occurs. This is primarily an epigraphic and orthographic description, only transporting linguistic information on a secondary layer (how does the syllabogram indicating the suffix relate to the spoken suffix vowel). Only in combination with the spelling group assignment, we relate the orthography with the expected underlying linguistics (is the reconstructed suffix vowel written out or not). As the analyses have shown, we have to carefully distinguish between relative frequency and statistical significance:

(a) *Relative frequency*: This figure indicates the percental amount of an attribute among the totality. It is often mistaken that a numerical majority does not necessarily mean significance. Consider for example the distribution of samples in the Central Peten region, where spelling group 1 counts $n_1 = 457$ (49.3%) and group 2 is $n_2 = 458$ (49.4%). In the Mopan-Pusilha region, spelling group 1 even has a slightly higher absolute and relative frequency compared to group 2 ($n_1 = 112$ or 52.1%, $n_2 = 103$ or 47.9%). However, in both cases, the statistical test falsifies the significance for spelling group 1 and proves it true for group 2. A relative frequency is descriptive, any bound to accept a figure as high enough must remain arbitrary.

(b) *Statistical significance*: In contrast, the significance test operates with a determined significance level to calculate a lower bound. To have strong support, the significance level was deliberately chosen to be $\alpha = 0.99$ for this study, only lowered to $\alpha = 0.95$ to determine tendencies in case no significant result was reached in both test pro and contra spelling group 1. The critical value k for the amount of group 1 samples is also increased by another condition: the number of spelling schemes (see Chapter 2.5.2). Combinatorics allows more feature permutations for a spelling scheme than group 2 or even group 3. By probability solutions, they are expected to appear more often, thus a higher p-value is needed, resulting in a higher critical value. This is also an explanation why relative frequency is an inappropriate indictor[578].

A relative frequency is appropriate to make qualitative statements about a feature, especially when comparing figures. But only the results from statistical test are able to quantify a feature, such as spelling schemes.

(3) *Hypothesis acceptance and linguistic implications*: When elevating the analyses to the spelling group level and conducting a significance test, we can evaluate if the number of spellings for any group is above a critical value.

[578] See footnote 29 for the reason to methodologically criticise the application of percentages to disharmony patterns and take these as evidence to deduct the existence of complex vowels. Chapter 4.2.3.1 reviews the original figures by Houston, Stuart and Robertson (1998) and try to apply a significance test as part of the objective to contribute to the question of harmony rules (see Chapter 1.4).

(a) *Alternative hypothesis H_1*: As this study seeks to use epigraphic data to determine the suffix phonology, the alternative hypothesis to proof is that vowel-providing spellings of group 1 reach a statistically significant amount for any selected showcase and were thus preferred by the scribes. If the alternative hypothesis can be accepted, we can assume that the linguistic hypothesis after which the spelling group and scheme attribution took place is also likely to be true (see Chapter 3.2). This is certainly not a "self-fulfilling prophecy" (Merton 1968: 195), nor has the analytical and statistical workflow been modelled to facilitate it – otherwise the epigraphic method needs be questioned as a whole.

(b) *Null hypothesis H_0*: In case the alternative hypothesis is not proven true, this does not necessarily mean that the insufficient amount of group 1 spellings is the result of a wrong linguistic hypothesis. It can also be an indicator that for this showcase, the preferences for writing a morpheme string are different for a couple of reasons in relation to the graphemic lexicon; and thus neglect a proper vowel indication. Any showcase has spelling group 1 samples, and if these reflect the linguistic hypothesis and are otherwise in graphematic accordance with spelling groups 2 or 3, then with all likelihood, the linguistic hypothesis is still true[579]. The morpho-syllabic system allows a large variability among its representational rules (see Chapter 1.2.1.2) and will always enable substitution patterns between the spellings groups. As the spelling schemes themselves are empty descriptors, with the deduction of analogous cases from one or more lexemes, it becomes easy to arrive at the correct conclusions even for those spellings that lack a corresponding example in one of the other spelling groups. Again, the discussion whether or not linguistic hypotheses are true is part of the discussions in Chapter 4 and not to be judged by the statistical analyses alone. The quality of the significance tests for the analytical showcases is summarised in Figure 49.

That a significance for spelling groups 1 or 2 is decoupled from the actual showcase is further supported by the tests undertaken for the geographic regions and the time periods, which were undertaken independent from any showcase and thus any linguistic implication (unless the gross of samples would be attributed to spelling schemes on false linguistic assumptions in the majority of showcases).

Of the 14 remaining showcases (merging 1MED with 1PASS and discarding 2POS), only two fully support spelling group 1 and the assumption of the preference of suffix vowel-providing spellings. Three partly provide support by not rejecting the significance of another spelling group. Eight showcases fully support spelling group 2 where the suffix vowel is just indicated, but fully predictable by the linguistic premises. When applying a significance test to this outcome, at least nine showcases that support H_1 for spelling group 1 (with or with-

[579] In order to falsify the linguistic hypothesis, it would require a significant amount of samples of spelling groups 2.a.i, 2.b.i, 2.c.i and 2.d.i, as these provide a root final vowel. But overall, their amount is neglectable, as Figure 47 showed. Schemes 2.e.i and 2.e.ii and group 3 do not contribute at all, as they simply utilise a morphographic root that in the transcription always requires reconstruction on the basis of linguistics.

out falsifying H_0 at the same time) are needed (with $p \approx 0.33$ and $\alpha = 0.99$) to claim spelling group 1 being significant for the chosen showcases.

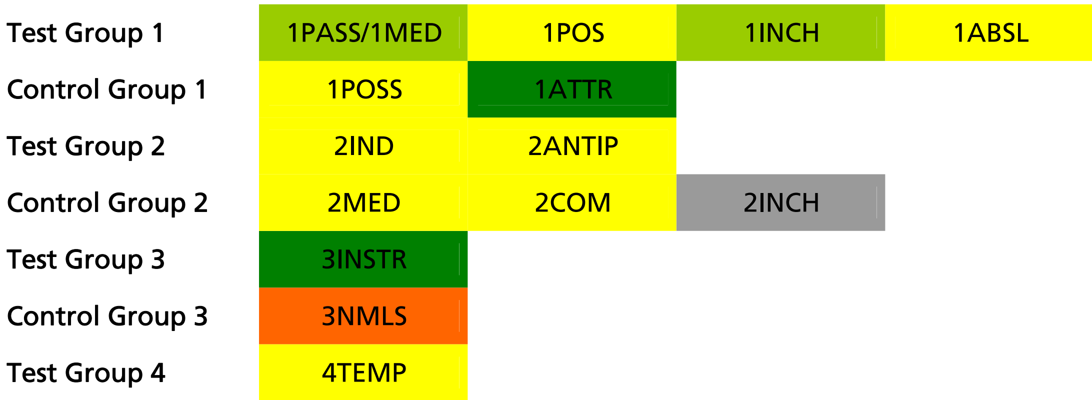

Figure 49: Significance test summary for all showcases with colour-coding of test result: = significance for spelling group 1; = for both spelling groups 1 and 2; = for spelling group 2; = for both spelling group 1 and 3; = no significance.

This is in accordance with the significance tests for the geographic regions and *K'atun* intervals that have demonstrated a prevalence for spelling group 2. Leaving the showcases apart, only Yucatan and some late time periods indicate a significance for spelling group 1. The correlation between these two parameters is summarised in Chapter 3.4.2.

(4) *Additional quantifiers*: The statistical significance for a specific showcase is ramified by a number of other factors, as the individual analyses in Chapter 3.3.3 have demonstrated in detail. The statistical analyses were considered a key quantifier to determine spelling significances from the start on and thus defined in the initial methodology (Chapter 2.5.2). Epigraphy has so far not ventured to a point, where methods of quantitative linguistics were applied; and until the data base compilation was completed, no firm evidence existed what dynamics might influence the variety of spelling patterns. As it turned out, one major impact factor is lexical diversity. While the concept of 'text entropy' is well established (see Chapter 3.3.3), it was so far not applied to Maya writing. The use of the Shannon Index for diversity and its related evenness quantifier was not systematically explored by linguistics (cf. Jarvis 2013: 93). This study is probably the first one to apply these indices not only for linguistics, but also in an epigraphic analysis. For example, for showcase 3INSTR, it was found that the abundance of syllabic spellings for *y-uk'-ib* is responsible for the significance of spelling group 1 (see Chapter 3.3.3.5), but only by means of the indices (Table 68), it is able to quantify this influence on the outcome of the statistical test. The indices are therefore an important explanatory corrective to evaluate the outcome of the primary significance test.

The significance tests have provided a substantial support for spellings that by the established methodology of how to analyse a hieroglyph (Chapter 2.3.2) can be considered as non-integrative, but vowel-providing. This is primarily a graphematic conclusion, with severe implications for the multi-tier analytical process (Chapter 1.2.3) when converting the transliteration into the transcription that has to rely on the linguistic premises reconstructed for the Classic Mayan language. The vowel-providing nature of deficient spellings is guaranteed by consistent spelling patterns that on the graphematic level help to correlate the suffix syllabogram with a specific suffix function and thus also the correct pronunciation (see Chapter 3.4.2). The distribution of the spelling schemes confirm the linguistic hypotheses to be largely correct. Most importantly, the statistical tests and the application of methods from quantitative linguistics provided the first proof of concept for Maya epigraphy.

3.4.2 – Epigraphic Analysis Conclusions

The epigraphic conclusions drawn from the analyses are not only reviewed against the desiderata as far as possible, but also the tentative conclusions from Chapter 3.2.2. While previous considerations built on the current state of research (or the lack thereof) and inferences from scattered epigraphic evidence, the still preliminary conclusions made here at least solidify the previous ones. Now, facts and figures are at hand, although the final evaluation can only be made after the discussion of the results. Several points can be (re)addressed at this stage.

(1) *Harmony rules*: The question of the supragraphematics indicated by synharmony and disharmony patterns (Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2004) is at this point of analysis still difficult to answer. For the root patterns, the analyses provided a large number of examples for (supposed) synharmonic roots, at least as the lexemes selected along the showcase sampling are concerned. Independent from any showcase, spellings of the schemes 1.a.i, 1.a.ii and 1.b.i are most common (see Figures 42 and 44). The database can provide figures of how often harmonic and disharmonic roots occur with the recording of samples for 219 lexemes. An in-depth discussion takes place in chapter 4.2.3 that also reviews the original figures from Houston, Stuart and Robertson (1998).

The results show, especially with the frequent scheme 1.b.i, that harmony alterations were a common orthographic principle to facilitate a vowel-providing spelling. More of importance are the harmony patterns between the suffix syllabogram and written or inferred suffix vowel, first approached by Lacadena and Wichmann (2005b). The implications of any pattern affects several aspects to be discussed in the following.

(2) *Affixation patterns*: The individual showcase analyses of Chapter 3.3.3 defined four basic types of suffix spellings (constant, semi-constant, harmonic, semi-harmonic, variable). The type of suffixation results in two different harmony patterns (always harmonic and sometimes harmonic), depending on the suffix vowel. Chapter 3.3.6.3 reviewed the case of CaC roots for 1PASS and 2IND and the relevance for the question of harmony rules in the suffix domain with variable harmony patterns. As constant (and partly semi-constant) suffixation patterns have to result in a variable harmony, it is hard to believe that the patterns indeed follow a 'rule' to indicate complex vowels. The variable harmony patterns would require several allomorphs with different vowel quantities, which seems questionable (see footnote

311). To what extent alternative explanations (see section 3d of Chapter 3.2.2) remain valid or if any supragraphematics must be suspended at all for the suffix domain remain unclear at this stage.

Table 73 summarises the affixation patterns for the showcases and quantifies by a significance level and the spelling diversity and evenness of the suffix. Only the patterns for / __# are included, as the syllabogram among / … is conditioned by the suffix to follow and often involves syncopation. The *k*-value provides the lower bound for the suffixation pattern under the conditions true or false. The value of *H'* indicates the overall diversity of patterns attested for the showcase. The higher the value is, the more of the samples collected adhere to the postulated suffixation type. The evenness index *J'* becomes lower the more the relevant suffixation type dominates the in the sample set. The value is higher, when all or the other patterns are of a rather homogenous size.

Showcase	N_S	Suffix /_#	*n*	*k*	*n* (%)	*H'*	*J'*	Type
1PASS/1MED	882	=ja	791	476	89.68	0.6540	0.2638	constant
1POS	7	=ja	6	6	85.71	0.6636	0.5917	constant
1INCH	241	=ja	222	139	92.12	0.7219	0.2350	constant
1ABSL	20	=ja	19	16	95.00	0.8199	0.2864	constant
1POSS	141	=le	110	84	78.02	0.5076	0.4891	constant
1ATTR	201	=lV_1	97	117	48.26	0.3324	0.7945	harmonic
2IND	364	=wa	269	204	73.90	0.5129	0.6077	constant
2ANTIP	208	=wi ~ =wa	130	121	62.50	0.3997	0.8347	semi-constant
2MED	484	=yi	409	268	84.50	0.5933	0.3766	constant
2COM	11	=ye	7	9	63.63	0.4035	0.8261	variable (?)
2INCH	9	=yi	6	8	66.67	0.4280	0.7725	constant (?)
3INSTR	466	=bi	434	258	93.13	0.7461	0.2665	constant
3NMLS	37	=lV_S ~ =la	32	26	86.49	0.5621	0.3579	semi-harmonic
4TEMP	244	=ji	214	140	87.71	0.5898	0.3280	constant

Table 73: Statistical relevant showcase suffixation patterns with N_S :=|3304|. Represented and tested is the pattern with the highest frequency. Parameters $p = 0.5$ and $\alpha = 0.99$ in all cases.

For most of the cases summarised here[580], a specific suffixation pattern can be determined, as all except three cases show an amount of samples equal or higher than the *k*-value, in accordance with a low diversity and evenness index. Some of the figures are influenced by a number of orthographic peculiarities that require explanation. For 1POSS, 1ATTR, 2IND, and 2ANTIP, we can observe a relatively high evenness, indicating other prominent patterns besides the featured pattern. The same showcases plus 1PASS/1MED, 2MED, and 3NMLS also have a rather high diversity, although it is not of great consequence for the evenness in the three additional showcases, the suffix variants are too low in number.

1POSS, 1ATTR, 2IND, and 2ANTIP all feature a fairly high amount of underspellings. It must be noted that these in part rely on spatial and diachronic preferences (see Chapter

[580] Deviating spelling patterns have been indicated and quantified in the individual showcase analyses and will not necessarily be repeated here. The discussion of the analyses in Chapter 4 will take part in an exemplary review of deviating cases.

3.3.6.2). With the codices excluded in favour of more ‘Classic’ spellings, the suffixation would be more consistent, although many examples remain with 1POSS and 1ATTR from ceramic vessels. 1ATTR furthermore has a remarkable amount of morphographic spellings in the suffix position that add an extra impact on the figures. This is the reason why the suggested =**l**$\mathbf{V_1}$ < –V_1l pattern for this showcase does not reach the lower significance bound, although it most frequent (but compare to 72 underspellings). And although for 2ANTIP, the pattern is clearly =**wa** / CaC__ < –V_1w and =**wi** / CVC__ < –V_1w, there are still many suffixations with =**wa** / CVC__ and =**wi** / CaC__ to distort the picture. 3NMLS is a somewhat special case, while =**l**$\mathbf{V_S}$ < –V_Sl is the pattern, the alternant =**la** is only true with spelling group 1. The showcases 2COM and 2INCH do not reach any significant pattern, the preferred pattern and type must remain tentative, although there is a trend.

(a) *Visual reading aid*: The results from Table 73 clearly confirm the idea of a ‘consistent’ sign application and the idea of a visual reading aid, as summarised in section 1 of Chapter 3.2.2. At least as far as the showcases are concerned, the majority realises this by the constant use of one particular syllabogram. However, the definition is fuzzy in some cases.

While the cases of test group 1 are considered as constant suffixation pattern by their use of =**ja** / __#, they are harmonic at the same time, as the suffix is *–aj* in all or most cases (for some possible exceptions with 1INCH, see Chapter 4.1.3). The same is true for 1POSS with =**le** / __# for *–el*. Partial harmony of a constant suffixation pattern can appear with *–V(C)* and –$V_1(C)$ suffixes. 2IND is such a case with =**wa** / __# that only becomes harmonic among a CaC root, the same with 2ANTIP, 2MED, 2COM, 2INCH, and 3INSTR. Partial deviations from a consistent pattern are allowed under several conditions that may be triggered by the root vowel. The spellings for 2ANTIP actively seek suffix vowel harmony with =**wa** / __# for CaC roots. Spellings for 3NMLS actively seek suffix vowel harmony with =**l**$\mathbf{V_S}$ / __#, but may abandon it in favour of =**la** / __# in case the suffix vowel is provided by a syllabic sign. A curiosity is 1ATTR that makes more prominent use of morphographs than any other showcase, but the vowel of the =**(C)VC** sign chosen is in any case root harmonic.

The patterns described open up further issues regarding the application of morphosyllabic signs that contribute to their refusal. It was mentioned elsewhere that the ‘meaning’ of morphosyllables would not allow one sign to be used for more than one function (Gronemeyer 2011b: 328-329), unless heterography becomes involved. The pattern for 2ANTIP adds another complication for a sign that is supposed to be **WA < –V_1w, used with root transitive verbs. A lacking definition of ****WI** for the antipassive in the original study surprises, as it would fulfil all criteria for a ‘regular’ morphosyllable (Houston, Robertson and Stuart 2001b: 15). The case of ****EL** applicable for 1POSS has also been discussed (Gronemeyer 2011b: 331)[581]. As a nominaliser, ****AL** was also introduced (Houston, Robertson and Stuart 2001b: 36), but it has been shown that a harmonic pattern is favoured; and what is considered a morphosyllable is rather a fall-back solution. A final discussion of morphosyllables takes place in Chapter 4.2.5.3.

The question regarding the use of heterography to distinguish homophonous, but functionally different suffix spellings also delivers a clear result. No differences are visible in the investigated showcases[582]. This also shows that no 'meaning' was involved in signs used in the suffix domain. It was simply not necessary, as the lexical class of the root provides a clear indication for the suffix function: if the root is a transitive verb, =**ja** can only indicate the passive or a mediopassive (not a positional, as a positional root is required; not the inchoative, as a nominal root is required; not the absolutive, as a substantival root is required).

(b) *Neutral vowel suffixation*: The question of neutral vowel suffixation was introduced in relation with morphosyllables (Houston, Robertson and Stuart 2001b: 15). By their definition, I would consider no restriction for any vowel, as they should be universally applicable (see footnote 581) and some are supposed to revert to a VC shape (Robertson et al. 2007: 4). With the traditional view of syllabic signs being used in the suffix domain applied in this study, a neutral vowel suffixation with =**Ca** / __# is more helpful to indicate a written, but silent vowel, as [a] is closest to the schwa [ə] sound. In this sense, it is an 'overspelling' as outlined in section 3b of Chapter 3.2.2, entailed by the CV structure of syllabograms.

As Table 73 shows, the preferred suffixation patterns do not indicate a significance of such spellings, only five showcases constantly use it, two additionally under special circumstances. Two cases usually apply a =**CV**$_1$ / __# harmonic pattern whose final vowel also remains silent, one uses =**le** / __# that also contains a vowel close to [ə], the rest follows a =**Ci** / __# pattern. Only 2MED applies a =**yi** suffixation to indicate *–y-i*, while the other do not constantly have another (underspelled) suffix to follow (no evidence for spellings of *–w-i* among 2ANTIP was found, see Chapter 3.3.3.3.2). It might have been desirable to use a =**Ca** / __# spellings, but the showcases do not support clear support, so with all likelihood, Knorozov's (1952) principle to generally leave any final vowel at a

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[581] Interestingly enough, ****EL** is introduced as a morphosyllable (Houston, Robertson and Stuart 2001b: 31), while the authors define a morphosyllable as a **CV** grapheme where "the unpronounced vowel can only be /a/, or /i/, […]" (Houston, Robertson and Stuart 2001b: 15). While the argument is phonological, it seems arbitrary why other forms should not be possible, as we argue on the graphematic level.

[582] For example, for the cases of test group 1 (suffix *–aj*), the following sign distributions for =**ja** / __# are attested: 1PASS/1MED: ZU1(1) – 190, ZU1(2) – 575, ZU1(3) – 17; 1POS: ZU1(1) – 1, ZU1(2) – 5; 1INCH: ZU1(1) – 14, ZU1(2) – 200, ZU1(3) – 1; 1ABSL: ZU1(1) – 5, ZU1(2) – 15. As **ja** has no 'true' allographs, a distinction would only be possible by one of the variants of ZU1. In fact, not many signs used for the preferred suffixation pattern have allographs, at least as far as the showcases are concerned. Showcases with true allographs do not have a case for comparison, but even within, the sign use is random, as for example for 3INSTR with =**bi** / __# are attested: AC6(1) – 22, AC6(2) – 34, HTF(1) – 8, XGE(1) – 360. In contrast, morphographs may show heterographic homophony (see footnote 24) only rarely to be broken.

juncture mute applies to suffix spellings[583]. Also note that the spelling of =**wa** / __# for 2IND does not indicate a $-V_1w$ suffix, but only $-V_1 \sim -V$, so it is in any case an overspelling. But the syllabogram still provides support as a reading aid, especially with morphographs and when the construction is to be identified as verbal, and not as a nominalisation by *–Ø*.

(c) *Underspellings*: The omittance of the suffix-indicating syllabogram can result in a partial underspelling **CV=Ø** / __# < *–V[C]* as case 1.g.i or complete underspelling =**Ø** < *–[VC]* as case 2.g.ii. The individual showcase analyses (Chapter 3.3.3) and a more specific review (Chapter 3.3.6.3) demonstrate that underspellings are not generally distributed, but it depends on the showcase and possibly the surrounding that a (partial) underspelling receives significance as an orthographic principle. This is for example true with the codices, and especially with 1PASS and 2IND. For the latter, underspellings were at least not insignificant in the Late Classic already and may be related to the fact that =**wa** / __# is always an overspelling and could be omitted with syllabic spellings that in any case provide the $-V_1 \sim -V$ vowel, while 2.g.ii is very rare. Other cases of significant amounts rather base on formulaic abbreviations[584] and cannot be accounted as linguistic implications.
Mora-Marín (2003a: 14-15, 18-21, 2004a: 5, 8-9) discussed spellings ending on =**Ci** / __# as potential underspelling with his affixation conventionalisation hypothesis. Especially with the broadened understanding of this concept outlined in section 3a of Chapter 3.2.2, such spellings are not necessarily an indication of an underspelled suffix to follow (as explained by **yu=k'i=bi**, see footnote 914 for a deeper discussion why this case is likely not applicable). We can also infer that no underspelling was present in a case like 2MED =**yi** / __#, where certainly no other suffix was following the $-V_1y$*-i* string expressed by the syllabogram, unless we explicitly have other signs, as with **K'A'=yi=ya** < *k'a'-y-Ø=iy* (DPL

[583] Otherwise, one might also wonder why the spellings of any lexeme would not simply be **CV-Ca** to indicate a final mute vowel, unless disharmonic patterns indeed provide a supragraphematic meaning.

[584] Showcase 1POSS counts 24 cases of underspellings, all of scheme 2.g.ii, with $k = 16$ (with $p \approx 0.06$ and $\alpha = 0.99$). All cases are either with *te'* from PSS contexts or with *bak* from the nominal phrase of *K'inich Kan Bahlam* II. The situation is even clearer with 1ATTR with 72 underspellings of schemes 1.g.i, 2.g.ii, and 4.a.iii, with $k = 28$ (with $p \approx 0.09$ and $\alpha = 0.99$). Most cases again are from formulaic expressions, such as nominal phrases (god names with *chan* and *kab*, captive epithets with *taj*), and with *tzih* from PSS contexts (often just spelled with a simple **tzi** sign). For 2ANTIP, there is a clear separation between 1.g.i spellings, all except one from the codices; and 2.g.ii examples, all from Late Classic nominal phrases with *lam* and *til*. The latter 19 examples would be significant with $k = 13$ (with $p \approx 0.03$ and $\alpha = 0.99$). With 58 examples, 2MED also features a significant amount of underspellings, with $k = 42$ (with $p \approx 0.06$ and $\alpha = 0.99$). All examples are either underspellings of *t'ab* or *uh*, all originating from PSS contexts on ceramic vessels with the exception of eight examples. – Abbreviatory spellings are common in many writing systems. The Romans are notorious for their abbreviations, such as in monumental inscriptions or on coins (e.g. <IMP DIVI F P P / COL NEM> for *imp[erator] divi f[ilii] p[ater] p[atriae] / col[onia] nem[ausus]* on Augustus Æ as RIC160 [Mattingly et al. 1923-94, I: #160]). For medieval Latin palaeography, compare Cappelli (1912) with many instances to contract syllables (e.g. <cōdº> for *conditio*, <aliā> for *aliam*, p. xxiv), but also to abbreviate entire morphemes (e.g. <3> for *–(o)rum*, as in <romano3> for *romanorum*, p. xxxiii). The same is known from Egyptian writing (Gardiner 1957: § 55), but more in a sense that sometimes usual complements, sometimes necessary determinatives are omitted, e.g. in the *ʿnḫ wḏꜣ snb*, "may he live, be prosperous, be healthy" salutation, or the *mꜣʿ-ḫrw*, "true of voice" epithet. Again, these are highly formulaic expressions.

HBh. 1, R1, note the syncopated mediopassive and the *–i* completive assimilated with the following enclitic, see Chapter 4.1.12). By the insignificant appearance of underspellings in the suffix domain outside formulaic expressions, we can assume that the affixation conventionalisation hypothesis is not applicable as a principle. The case of 2IND is, as said above, not relevant either, as the suffix does not end on a consonant, unless we have ~ $-V_1w$ / …, which is not attested.

(3) *Sign diversity*: This is not concerned about the allography diversity in the graphemic lexicon which has been investigated in other studies (e.g. Grube [1990a: 44-46, 70-75] on syllabograms). Of interest for the statistical significance of spelling group 2 for some showcases and the distribution of spelling schemes is the existence of a morphograph for a lexeme. Do showcases with a significant amount of group 1 spelling have a broader lexeme variety, with many lexemes for which simply no morphograph was ever introduced? If one compares the frequency of spelling groups with morphographic spellings on a regional and diachronic basis (Figures 41 and 43), there is an apparent tendency that with a ratio of morphographs, spelling group 2 is (more) significant. Table 68 summarises the lexical diversity H' for all showcases and with all samples. In order to determine the impact of morphographs, $\Delta H'$ is calculated (Table 74) and defined as:

$\Delta H' = H'_S - H'_M$, where

H'_S is the index of all samples, and

H'_M is the index of the samples with a morphographic spelling[585].

Showcase	H'_S	H'_M	$\Delta H'$	S	N
1MED	0.3333	1.0000	-0.6667	2	0
4TEMP	0.0187	0.3852	-0.3665	12	302
1ABSL	0.2467	0.4700	-0.2233	4	14
2COM	0.2407	0.3775	-0.1368	3	8
1POS	0.5338	0.6636	-0.1298	2	14
2INCH	0.1602	0.2887	-0.1285	4	6
1ATTR	0.1097	0.2057	-0.0960	11	107
2IND	0.0505	0.1247	-0.0742	18	204
1PASS	0.0492	0.1191	-0.0699	31	434
2ANTIP	0.0734	0.1364	-0.0630	15	157
3NMLS	0.0562	0.1111	-0.0549	11	18
2MED	0.1525	0.2030	-0.0505	15	469
1INCH	0.1375	0.1756	-0.0381	25	297
1POSS	0.4743	0.4943	-0.0200	4	138
3INSTR	0.4011	0.2869	0.1142	8	67

Table 74: Morphographic lexeme diversity difference $\Delta H'$ for analytical showcases with N_S :=|2235| and N_R := |100|, sorted by $\Delta H'$.

585 For the determination of N for each S for which a morphograph exists, no difference is made whether any sample is written by a complemented morphograph or purely morphographically (thus falling into spelling group 1 or 2 or 3). Only purely syllabic spellings are excluded. The $\Delta H'$ obtained this way thus describes the true difference to syllabic spellings as found in the epigraphic record, not an 'ideal' difference even if these samples could have been written by a morphograph. Of course, $\Delta H'$ can only be based on currently deciphered morphographs.

The rate of $\Delta H'$ therefore quantifies how the lexical diversity for a showcase changes when all syllabic spellings are excluded. With a negative difference, the showcase becomes less diverse, a positive amplitude signifies a more diversified lexical range. The figures have two implications: (1) the larger the difference is to 0, the bigger is the influence of pure syllabic spellings on *lexical diversity*, and (2) the closer the value is to 0, the less contribute pure syllabic spellings to the *significance* of the test result.

The two extremes exemplify these relations. Showcase 1MED contains three samples, and two could be written by a morphograph, but none is; hence the diversity becomes least and the impact on the significance for spelling group 1 is maximal. Showcase 3INSTR is heavily influenced by **yu=k'i=bi** spellings (see Chapter 3.3.3.5) for which a morphographic spelling **yu=UK'=bi** would be possible. With the syllabic spellings removed, the evenness of the showcase increases; therefore also the lexical diversity (i.e. the entropy) decreases. Another good case for explanation is 1POSS being relatively close to 0, demonstrating that most lexemes have a morphographic counterpart that is also predominantly used.

The figures for $\Delta H'$ are thus also further support that the significance of spelling group 2 among the majority of showcases is more the result of graphematic conditions than a false linguistic hypothesis (see Chapter 3.4.1). However, some of the indices are biased by morphographs that in fact are only very limited in their range of usage, sometimes restricted to one site or even a single text. Examples are MR6 **TZ'IB** (see Chapter 2.5.3.2), MZM **JATZ'** (cf. Martin 2003: fn. 20, Nielsen and Helmke 2008: fn. 6) or 1C5 **TZ'AP** (see Chapter 4.1.1).

(4) *Syllabogram increase*: The sign (or rather spelling) diversity also relates to the increase of syllabic spellings and complemented morphographs towards the end of the Late Classic and in the Early Post-Classic (Figure 43). It is qualitative, but as the significance tests show, not necessarily quantitative (see Chapter 3.3.5). One possible relation not considered here is the increase of (syllabic) allographs and the much more diversified graphemic lexicon from around 9.10 on (cf. Grube 1990a: 44-46, 70-75). Here, the question of cause and effect remains: did the intensified use of syllabic spellings result from an innovative sign inventory or vice versa and what sociological triggers were involved?

With Yucatan becoming the preserver of a scribal tradition after the collapse, it is to question to what extent texts from this region contributed to the impression of more late syllabic spellings among epigraphers. Only to some extent prove the showcases this influence to be true, but a significance is not necessarily given. And of course, not all spelling cases are considered, the showcases have a limited morphological range and above all exclude mere root and prefixed spellings. While a significance might be found in these instances, it is beyond the scope of this study. But as far as (showcase) spellings are concerned that provide an orthographic interaction between free and suffixed bound morphemes, the result is not overly significant (see Chapter 3.3.6.1 and 4.2.4 for a concluding discussion).

Especially for Yucatan, this outcome may surprise: prefixes almost condition a full phonemic spelling with vowel integration due to the **CV** structure of syllabograms (with rare exceptions, where a VC– prefix requires a V-CV= spelling, cf. Gronemeyer [2011b: 321-322]), but not the suffix domain. An increase of syllabic spellings would facilitate the writing of suffixes with vowel-integration, but the statistical tests provide a different result. A greater role of syllabograms should at least not be overestimated for these cases, assuming a certain conservatism in writing; even if it was already in a situation of diglossia[586].

The conclusions of the statistical analyses for epigraphy – for the graphematics of Maya writing – are important in a couple of ways. We can testify a 'best practice' syllabogram use to indicate a suffix and its function with partial inference from the lexical class of the root. Section 4 of Chapter 1.4 considered a dogmatic and dynamic way of economic writing. This can largely be proven to be an appropriate description. One type of suffixation (Table 73) is the preferred standard in writing, it is the 'prescriptive' component in writing (see Chapter 2.5.3.1). But it is still far away from being authorative, the flexibility the sign inventory allows leaves the scribe with many possibilities to spell a morpheme string that does not need to be *per se* wrong. A spelling can be economic, but does not have to be. It can be bound to a 'standard' Classic Mayan language, but does not have to be; vernaculars can also follow the preferred way of writing. Like the underlying language is subject to change and evolution (see Chapter 3.2.1), so is the writing system. To embroider all these facets with glyphic evidence (and finally illustrations) will be the major task of Chapter 4.

3.4.3 – Linguistic Analysis Conclusions

As the statistical analyses are only concerned with spelling patterns as the physical emanation of spoken language, not many statistical inferences can be made with regard to linguistics. As the spelling schemes are to some extent decoupled from the linguistic question of the correct pronunciation (or vocalisation, rather) of bound morphemes, they are even more from the historical configuration of Classic Mayan. In relation to the linguistic hypothesis and the expected spelling patterns (Chapter 3.1), the spelling scheme attribution is the binary answer to whether the spelling was vowel-providing and thus fully phonemic or not. A few annotations still can be made to prepare Chapter 4.

(1) *Feature arrays*: In Chapter 3.3.6.2, a few analyses are conducted that tangle linguistic aspects by reviewing certain spelling practices in a spatial and temporal matrix. These are only made to answer some immediate questions that arose during the showcase analyses. But it is up to

[586] Such a result is again in accordance with the observations Fairman (1945: 55-57) made in relation to Ptolemaic writing: the recorded language was a dead one (with many borrowings from Old and Middle Egyptian); and despite the massive changes in the graphemic lexicon, Ptolemaic writing is the continuation of earlier stages, and as a system with a self-contained logic. Two of Fairman's (1945: 131) statements can be applied one-to-one to the epigraphy of Terminal Classic and Post-Classic Yucatan: that (1) "[t]he difficulties that attend the reading of late hieroglyphic texts are very largely due to the unfamiliarity of their outward appearance and not to any new or foreign procedure that had no part in the texts of earlier periods"; and (2) "[…] that Ptolemaic is archaistic and gives added emphasis to and revives processes that were largely obsolete in classical Egyptian." The prominent use of morphographic spellings in the Codex Dresden is just one example of this parallel.

the showcase discussion to make use of the epigraphy and the spelling patterns to support historical linguistics and fulfil one of the major objectives of this study. Thus, methods previously described find their return to pursue specific questions. For example a region/time matrix for samples of 1POS can answer the linguistic postulate for an early pCh and a pTz form to be reflected (Chapter 4.1.2). Another instance is the case study of the verb *tzutz* (Hruby and Robertson 2001) that can be reviewed, but also enlarged with samples from other verbs (Chapter 4.1.12). The data base has enough parameters to generate any desired data array to be discussed. Especially questions concerning language geography, vernaculars and language development can be pursued this way, helping to trace isographs and isoglosses. The patterning of *–C-aj* inchoatives may be such a case (Chapter 4.1.3), or the occurrences of antipassives on *–Vw* and *–Vn* with a focus marker (Chapter 4.1.10).

Such questions are linguistically determined, therefore no statistics are required. When a specific form appears in writing, it must have existed in spoken language. Of course, it would be appealing to find support for certain forms or influences by quantification, but in most cases the epigraphic record is not broad enough. But even such singular glimpses that surface from the 'standard' sea of texts are important. With the showcases defined, hopefully enough samples will form the mosaic for a broader picture. In the end, it will help to refine the position of Classic Mayan in the Ch'olan branch (see Chapter 4.3.5) and calibrate its temporal extension.

(2) *Representativeness*: Before the actual examination of the corpus took place, it was the aim of the showcase definition (Chapter 2.1) to select representative suffixes that follow a certain phonological pattern. While the linguistic review (Chapter 3.1) largely proved this to be a well-made selection, the analyses show that a similar vocalisation does not necessarily mean a similar orthographic realisation. Likewise, the same spelling does not automatically mean identical pronunciation.

Besides the phonological coverage of the showcases, they also comprise many instances of verb diatheses and inflections. Although Mayan languages allow a broad use of stative constructions, verbs constitute the narrative backbone of a text and the corpus. Therefore, the samples reflect a good portion of the rhetorics of all genres available to epigraphy. As Chapter 3.3.2 indicates, rhetorics apparently shows a close correlation to lexical diversity. The samples are likely representative in this respect, and at least provide a concise mirroring of verbal orthographic conventions. Nominal (and nominalised) affixes are represented to a lesser degree. But when applying a Zipfian distribution, the grammatological extract provided by the showcases is certainly proportional to the entirety of inflections and derivations found in the corpus.

(3) *A look left and right*: The main focus of the data base compilation was the sampling of spellings that adhere and contribute to the analytical showcases. But the linguistic review and hypothesis formulation (Chapter 3.1) shows that many other instances also influence the

showcases. A prime example is the historical development of the antipassive in the WM branch. Apart from the showcases, the data base also contains samples that contribute to cases outside the analytical focus of this study. Such instances may help in many respects. They may provide graphematic and phonological implications relevant to the showcases, but also to settle a showcase in the broader picture. For example, a potential *–aj* nominaliser is mentioned in Chapter 2.1.1.1, where it was refused to become part of the showcases because of its unclear phonology and general definition by the current state of research. But the sampling has provided some valuable cases that at least enables a discussion in addition to the showcases (Chapter 4.1.5). The same is true for antipassives on *–Vn* and *–Ø* (Chapter 4.1.11).

Especially vernacular forms benefit from the thorough scanning of the corpus, if not part of the showcases. They receive attention in Chapter 4.3.4 together with the showcase samples. The advantage is clear: to form a more concise picture of the dynamics of Mayan languages in the Classic and Post-Classic period. One example are pYu passive forms, but also cases thus far without a connection to the historical configuration of ClM, such as the *–Vn* inchoative.

As all conclusions are now laid out, both from linguistics and from epigraphy via the statistics, the following discussion can now bring theory and reality together. This will be the final brick for the building of orthographic conventions and how it reflects spoken language. To reconstruct the phonology behind will be the roofing ceremony of this study. Yet, still many other discussions need to take place, before finally the results can be evaluated against its objectives and the current state of research.

4 – Discussion of the Results

Boy. "They haue beene at a great feast of Languages, and stolne the scraps."
Clow. "O they haue liu'd long on the almes-basket of words. I maruell thy M. hath not eaten thee for a word, for thou art not so long by the head as honorificabilitudinitatibus: Thou art easier swallowed then a flapdragon."
William Shakespeare, c. 1598: Love's Labor's Lost, Act V, Scene 1

The previous chapter started with linguistic hypotheses and culminated with the statistical analyses of their realisation in writing. While the analyses were rather a container for content, phonology, and function; this chapter will draw back the focus to the epigraphy and discuss the orthographic patterns discovered and refine the raw data. The showcases selected and samples collected are much more valuable than the scraps of the alms basket of the hieroglyphic corpus. The lexemes and suffixes retrieved from it yield sufficient material for discussion and to turn this chapter into a great fest of epigraphy *and* linguistics.

This chapter pursues several purposes. The most important is to bring the epigraphic evidence together with the linguistic hypotheses. Hereby, the sample selection and attribution is rectified, and substantial background is provided to the analyses to explain both the graphematic and linguistic foundations for each showcase. Not only the showcases will be discussed in detail, but also related grammatical forms that impact them.

A discussion related to the showcases is not the only aim of this chapter. In order to obtain a broader perspective, into which the showcases are embedded, a review of certain epigraphic and linguistic questions takes place. These are directly related to the desiderata expressed in Chapter 1.4 and the objectives formulated in Chapter 1.5. Related questions include graphematics and graphotactics; as well as language geography, vernacular influences and phylogenetic issues.

4.1 – Showcases

The discussion of the showcases will divide into individual chapters for each suffix and its corresponding function, following the structure of Chapters 3.1 and 3.3. Each discussion follows a standardised scheme, tangling the following aspects: (1) attested spelling schemes, (2) the general phonemics derived from the spellings, (3) attested or potential alloforms derived from the spellings, (4) morphophonemic processes derived from the spellings (such as assimilation, debuccalisation, syncopation), and (5) the functional rage (such as the root or stem bases and possible semantics). Additional discussions are occasionally made, if required. The accompanying illustrations seek to provide a full coverage of the lexical diversity attested with each showcase, as well as detailing the spelling variations for each lexeme. The glyphic examples are restricted to the proper morphological unit, but from case to case, the context is provided when necessary.

These aspects are discussed on the background of the linguistic materials compiled in Chapter 3.1. Not only is evidence sought that supports the expected spelling patterns by their most likely 'standard' ClM form. The identification of allophonic forms and their spellings will ultimately result in a more accurate transcription; the same, if patterns for morphophonemically induced spellings are found. Especially the latter might not only require grammatical evidence from contemporaneous languages, but also from general phonemics to rectify the arguments.

Besides the proper showcases defined in Chapter 2.1, some additional sections are included that discuss related grammatical forms that were touched during the linguistic hypotheses and help to explain certain spellings. These include the agentive *–aj* (Chapter 4.1.5), the transitive nominalisers *–i* and *–Ø* (Chapter 4.1.9), the antipassive on *–(V)n* (Chapter 4.1.11), and the intransitive nominaliser *–Ø* (Chapter 4.1.14). Although no intransitive positional marker *–*V_1y was securely attested, Chapter 4.1.16 will discuss some problematic forms attributed to different showcases and investigate the reasons of why it is not represented in the script.

As the test and control groups have thus far fulfilled their roles in the statistic analyses, they are not further applied in the epigraphic and linguistic discussion. As the statistical analyses have shown, their spellings patterns do not necessarily parallel their similarity in the vocalisation of the suffix vowel.

4.1.1 – Passive Thematic *–aj* ~ *–C-aj* ~ *–j* and Mediopassive Suffix *–C-aj*

The epigraphic evidence leaves little doubt that the standard ClM passive is following the paradigms *<h>…-aj* for root transitive and *–n-aj* ~ *–w-aj* for derived transitive verbs (Lacadena 2004b). This includes the *–C-aj* pattern for mediopassive forms. The ClM configuration follows the pattern attested for ECh (Table 6) by suffixing a thematic to the derived stem, while the derivation takes places by an infix or a suffix. However, the morphophonemics of the regular *<h>* infix requires further review[587]. Some irregular non-CVC forms were found that possibly follow a different derivation, but these are again marked by an *–aj* thematic. Other Ch'olan vernacular forms are not securely attested. Yucatec vernaculars are described in Chapter 4.3.4.1.

As Chapter 3.3.6.3 showed, most root transitive verbs attested in passive voice are of a CaC root. As long as this root is synharmonically spelled (Figure 50), no alteration of the final or complemented syllabogram of the spelling is needed: **Ca-Ca / CaC**$^{\mathbf{Ca}}$ > **Ca-Ca=ja / CaC-Ca=ja** for a *Ca<h>C-aj* form. These samples classify as spelling scheme 1.a.i and provide the largest frequency of all spelling group 1 samples (for all figures, refer to Chapter 3.3.3.1.1). Although no passive forms of regular ʔVC roots (such as *ak'*, "to give") are attested, we may speculate about the morphophonemics of the derivational infix of such roots (see below), as such examples are notoriously avoided by grammars.

[587] This is not directly related to the objective of this study, as it does not affect the spelling patterns related to the thematic suffix. And only seldom is the infix indicated by a special spelling. But as it is the scope to better define the pronunciation of the Classic Mayan language on the basis of the orthography, there is ample justification to discuss the infix. This ensures a holistic approach for the phonemics and orthography of the passive as a grammatical process.

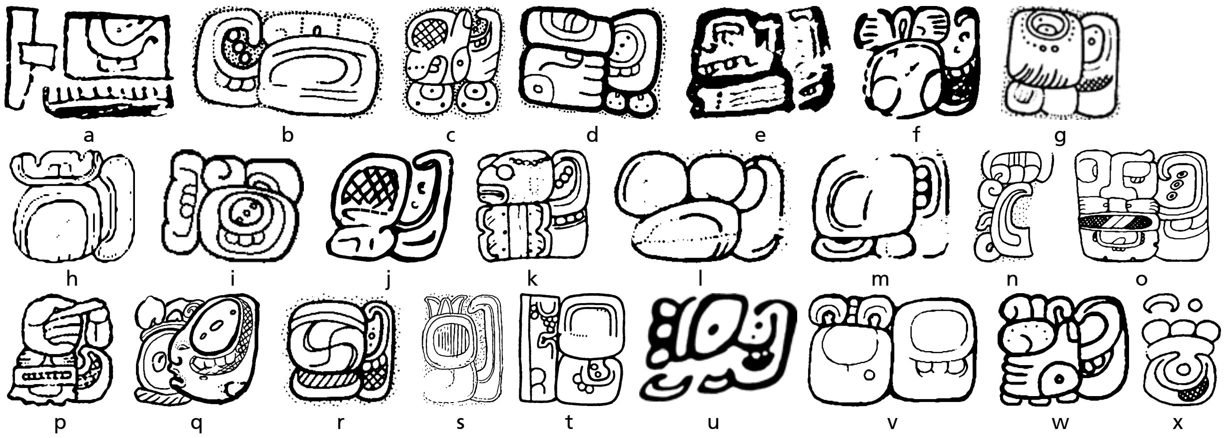

Figure 50: Examples of passivations with integrative synharmonic CaC root transitives. **a) CH'AK-ka=ja** (C Ma. 98b), **b) ja-tz'a=ja** (OXP St. 7, B6), **c) k'a-la=ja** (XCA Pil. 1, B1), **d) K'AL-la=ja** (COL P. Stendahl, C2b), **e) k'a-sa=ja** (C Ma. 41a), **f) ma-cha=ja** (NAR K1398, T1), **g) ma-ka=ja** (PNG St. 1, J2), **h) na-ba=ja** (ALS St. 4, C2), **i) na-wa=ja** (LTI P. 1, B4)[588], **j) pa-k'a=ja** (COL K7447, B3), **k) pa-sa=ja** (TIK Alt. 5, 26), **l) PAT-ta=ja** (CPN Alt. H', N1b)[589], **m) sa-wa=ja** (NAR St. 23, H13)[590], **n) ta-ya=ja** (TNA P. Emiliano Zapata, Ap1a)[591], **o) tzu-tza=ja** (PMT P. 1, pE5), **p) TZUTZ-tza=ja** (LAC St. 7, B10), **q) tz'a-ka=ja** (COL Shl. Taylor Limpet, D1)[592], **r) TZ'AK-ka=ja** (CNC P. 1, L5), **s) tz'a-pa=ja** (BJC St. 2, A6), **t) TZ'AP?-pa=ja** (QRG St. C, G1)[593], **u) tz'a-ya=ja** (NTN Dwg. 88, D2) **v) ya-la=ja** (AML P. 2, A3), **w) ya-AL-la=ja** (COL Lnt. 2 Site R, A2), **x) ya-tz'a=ja** (TRT Mon. 8, B46a).

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588 See footnotes 15 and 95 for the discussion why the spelling rather implies the root *naw* "to reveal" as a 1.a.i scheme case, rather than *na'*, "to know" that would make it a 1.f.ii spelling with ***na[']-w-aj*. While the spelling **NAH-wa=ja** < *na<h>w-aj-Ø* (PAL T18S, A5) is one piece of evidence, there is also a perfect example **ma u=na-wa=ji** < *ma['] u-naw-aj-Ø* (Figure 162c). Otherwise, the perfect would be ***u-na[']-aj-Ø* and could not explain the presence of the **wa** sign. Furthermore, *na'* is a regular root transitive in all Ch'olan languages that does not require passivation by the derived transitive scheme. There is also no alteration with the *–n* allomorph (Figure 58e-f) that is far more common in comparison. The verb does not only appear in connection with 'marriage' statements, but also with the presentation of captives, as e.g. on LTI P. 1 or DPL St. 16.

589 Although *pat* is usually attested as a positional root, it is here used as a passivised transitive root (cf. Wichmann 2002a-8). More examples are: CPN Alt. I', K2b; CRN P. 1, E3; PAL TCB, K2; C Dr. 52b, B3; C Dr. 61, A8, B13; C Dr. 69, C3, B13, D13. Also note the spellings in Figures 58i and 63i to be discussed below. Other forms of *pat* discussed are as an intransitive positional (see Chapter 4.1.2); and as a transitive (Chapter 4.1.8) with anti-passive (Chapter 4.1.10) and mediopassive (Chapter 4.1.12) derivations, and as a perfect (Chapter 4.1.19).

590 Proposed translation for *saw*: "to twist". Compare to CHN *säw*, "to twist" (Knowles 1984-88) and *säwe'*, "trenzar, cruzar, entrelazar, atravezar" (Keller and Luciano 1997: 213). The transitive nature of this root is strengthened by a possible nominalised form **u=sa-wa** < *u-saw-Ø-Ø* on NAR St. 32, N2 (cf. Le Fort and Wald 1995: 112). The passive form on NAR St. 23 is followed by **u=TOK'=PAKAL**, so we possibly have a semantic substitution for the regular *jub-uy-i* expression.

591 No satisfactory translation can be given for *tay*. Compare to CHN *täy*, "to streak" and *tay-ä(n)* "to rub, to press" (Knowles 1984-88), *tayän*, "amasar" (Keller and Luciano 1997: 227); TZO *tay ~ toy*, "lift, raise, boost" (Laughlin 1975: 332, 345); and YUK *taay*, "acabar, consumer" (Barrera Vásquez 1993: 781). Overall, the YUK meaning is more likely (also supported by Boot [2009b: 163]), in this context see footnote 925 for explanations among nominalised forms. For the example from TNA P. Emiliano Zapata, the TZO meaning might be viable, but insufficient context is provided.

592 Although *tz'ak* is normally attested as a positional root, it is used as a passivised transitive verb, also in the case of Figure 50r. Other passive examples of *tz'ak* are: MTL K4996, P1; NAR K2796, O2; NAR K7750, Y2; RAZ K2914, W1-X1. See Chapter 4.1.5 for a broader discussion as a positional root. Other cases of *tz'ak* as a transitive form are discussed in Chapters 4.1.8 and 4.1.19.

593 With all likelihood, there are two distinct and separately innovated morphographs for **TZ'AP** (see footnote 107). One variant was first proposed by Stuart (2004) on TIK St. 26, Ap2. He based his interpretation on the context with *u-lakam-tun-il* following, but also by iconological considerations. The case of QRG St. C is likewise based on the graphical representation to identify the sign 1C5 as the image of a stela (cf. Macri and Looper 2003b: 270). I further support this by the phonemic complementation, assuming that the badly weathered main sign is indeed **pa** and is misdrawn in both Maudslay (1974, II: pl. 19) and Looper (whose drawing [2003: fig. 5.19] is corrected after inspection of the original). The **ja** clearly serves to indicate the thematic suffix. Alternatively, the spelling could also be interpreted as **TZ'AP=pa=ja** for a mediopassive, similar to the case of CPN St. B (see below and Figure 64b). The decipherment as *tz'ap* is further supported by the nominal phrase following, naming

Otherwise, any other synharmonic CVC root (Figure 51) or any disharmonic root not spelled with a **Ca** syllabogram (Figure 52) requires the final or complemented grapheme to change to a **Ca** value to provide the suffix vowel: $\mathbf{CV_1\text{-}CV_1}$ / $\mathbf{CV_1C^{CV_1}}$ or $\mathbf{CV_1\text{-}CV_2}$ / $\mathbf{CV_1C^{CV_2}}$ > $\mathbf{CV_1\text{-}Ca{=}ja}$ / $\mathbf{CV_1C\text{-}Ca{=}ja}$ for a *CV_1<h>C-aj* form. These samples classify as spelling scheme 1.b.i, or 1.c.i and 1.d.i, respectively.

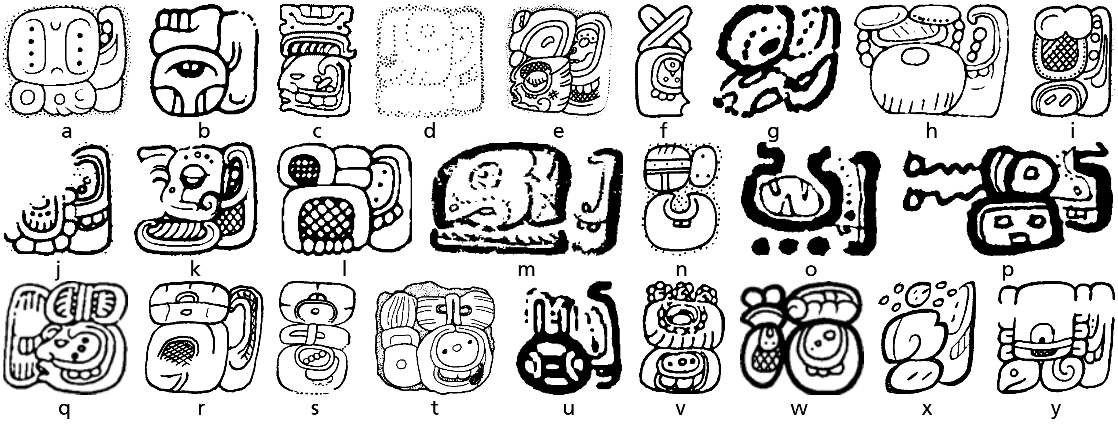

Figure 51: Examples of passivations with integrative other synharmonic root transitives. **a) bo-t'a?=ja** (XLM Lnt. 1, C1)[594], **b) cho-cha=ja** (NMP St. 15, M1)[595], **c) cho-ka=ja** (QRG St. F, C9a), **d) CHOK-ka=ja** (UAX St. 12, A4), **e) chu-ka=ja** (YAX Lnt. 44, A3), **f) JEL-la=ja** (QRG St. C, 6a), **g) ku-cha=ja** (COL K2794, C1), **h) k'u-ba=ja** (TIK Alt. 5, 15), **i) k'u-xa=ja** (NAR HS. 1 VI, L2b)[596], **j) mo-ba=ja** (CRC Alt. 12, D1)[597], **k) mu-ka=ja** (DPL St. 8, H14), **l) nu-pa=ja** (BPK St. 2,B5), **m) pe-ka=ja** (C Dr. 5b), **n) pu-la=ja** (YUL Lnt. 1, B4), **o) se-la=ja** (C Ma. 108c)[598], **p) si-na=ja** (C Ma. 102c), **q) su-sa=ja** (CPN St. A, B7b)[599], **r) te-k'a=ja** (PAL P. DOAKS 2, C3), **s) te-ta=ja** (CPN HS. 1 LIII, E1a), **t) ti-ma=ja** (PAL T18S, 271b), **u) to-ka=ja** (C Pa. 7c)[600], **v) to-ma=ja** (CPN St. A, A12b)[601], **w) tu-ta=ja** (BPK ScS. 5, L2), **x) t'o-xa=ja** (CML U. 26 Pdt. 1, A3), **y) xo-ya=ja** (YAX St. 18, B4)[602].

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6 $^{\#}$AJAW TUN^{ni} < *wak ajaw tun*, "the 6-*Ajaw*-Stone". It equals the proper name of QRG St. A, B10-A11 and parallels *huk ajaw tun* on QRG St. D, B18a. Furthermore, the associated date with this supposed *tz'ap* event is 9.17.4.10.12, only five months before the *Hotun* that is commemorated by QRG St. C. This may be a glimpse that the actual erection (and subsequent carving?) of the stela took place before its 'ritual' planting on the occasion of the period ending. Most other inscriptions thus only refer to the latter action.

[594] Proposed translation for *bot'*: "to (s)mash, to buckle". For this spelling, I suspect the reading **bo-t'a?=ja** < *bo<h>t'-aj-Ø*, that also appears on COL Jmb. Amparo, Bp3. The subfix in both cases is identical to the grapheme found on IKL Lnt. 1, A1 in the proposed **t'a-ba=yi** spelling (see footnote 36). In two additional cases (PNG Msc. Peabody, A5b and UXM Cst. 2, see Figures 128j and 130b), a very similar grapheme is prefixed to **T'AB** as a phonemic complement. At least a **Ca** value of the grapheme is supported by its position within a passive form that with all likelihood is vowel-providing. No cognates for *bot'* are found in Ch'olan, but YUK has "magullar, levantar chichón" (Barrera Vásquez 1993: 65). The expression from XLM Lnt. 1 is embedded in a dedication phrase and follows *alay pet-aj-Ø* (A1-B1) and it precedes *y-uxul-il=e[']* (E1-F1, likely with the *=e'* enclitic, see footnote 81). The example from the Museo Amparo jamb appears in a similar dedication statement. In this context, *bot'* likely refers to the carving of the elevated glyphs from the background of the bas-relief. The two examples of *bot'* are a Yukatekan vernacular with ClM inflection, another attested case of diglossia. Also see Lacadena (2012: 54, fn. 14) interpreting the superfix as either **o** (with ***bo'-[a]j* or ***boh-[a]j* as a passive) or **TE'** (with ***bo[h]+te'-[a]j* as an inchoative). I do not deem one or the other proposal viable for grammatical and morphophonemic reasons.

[595] No satisfactory translation can be given for *choch*. The reading of XS3 as **cha** is preferred in contrast to **se**, as it results in a vowel-providing spelling. The only evidence from the Ch'olan branch is CHN *choch-o(n)*, "to peak at wood" (Knowles 1984-88). The best semantic range comes from YUK as "deshacer, desatar", "aflojar, desanudar", "dejar, transformar", and "transfigurarse" (Barrera Vásquez 1993: 103-104). Boot (2009b: 54) lists *choch* as "intestines", but the example from NMP St. 15 is likely not related to the YUK noun "tripas" (which would require the spelling to be interpreted as an inchoative).

[596] See Tokovinine (2007: 16-19) who considers this and a parallel case from NAR Frg. 1, pB3 to be part of a nominal phrase or a toponym, involving an *–aj* nominaliser. See Chapter 4.1.5 for further consideration of such a

a b c

Figure 52: Examples of passivations with integrative disharmonic root transitives. **a) che-ka=ja** (CRC St. 6, C23)[603], **b) PUK-ka=ja K'AK'** (CRN HS. 2 XI, B4), **c) tza-ka=ja** (COL St. Brussels, A17).

A few samples in the corpus remain with an undeciphered or doubtful or otherwise illegible root (Figure 53). Most of these cases include a **Ca** syllabogram that either points to a full syllabic spelling or phonemic complementation by a morphographic root spelling. The attribution as a passive form is in any case made by the presence of **=ja** / __# or **=jV** / … and either made by the syntactic role or, if available, by comparison with other occurrences that prove the root transitive nature of the unknown lexeme. For some, doubts may remain, as they might also reflect in inchoative spelling. Those with a word final thematic all spell **CV-Ca=ja / CVC-Ca=ja** for a *CV<h>C-aj* form.

function for an *–aj* suffix. I see no reason why the examples cited could not act as a predicate, as Tokovinine also discusses. I also follow a different reading order of NAR Frg. 1, and *k'ux* is attested as a transitive verb in Ch'olan languages (see footnote 364) that can thus be passivised.

597 No satisfactory translation can be given for *mob*, as the root is not attested. The only close lexemes are CHL *mop'* as "empuñar" (Aulie and de Aulie 1978: 59) and CHN *mop'e'*, "tener algo dentro de la mano" (Keller and Luciano 1997: 162). An explanation might be a fortition process ClM [b'] > WCh [p'] that also appears in other surroundings and with other LL languages around 1000 AD (Wichmann 2006b: 53). On CRC Alt. 12, the subject of the verb and a prepositional phrase *t-u-bah-il* with the name of *K'inich Tobil Yopat* follows. Possibly the verb refers to frond held by *Papamalil*, who is seated on the left side of the scenery. As the **ba** sign is infixed into **mo**, it is likely read last, also as it provides the suffix vowel.

598 Proposed translation for *sel*: "to grind maize". As this is a codical example, YUK provides best evidence with *sel* as a noun for "el polvo de maíz" and the transitive "frangullar el maíz, moler lo mal molido" (Barrera Vásquez 1993: 724). It is possible that this meaning is related to CHN *sél-ä(n)*, "to sliver" (Knowles 1984-88). As a Yukatekan vernacular, it is derived as a ClM verb.

599 See Wichmann (2002a: 23-27) who considers this example to be evidence for a CHR vernacular, as the root in all other Ch'olan languages passivises as a non-CVC. He assumes that the root was originally **suhs*, "losing the preconsonantal *h*, perhaps as a regular change conditioned by the following *s*" (Wichmann 2002a: 27). If such a process took place (also see footnote 753), it would also be relevant for the question of the morphophonemics of the <*h*> infix.

600 Proposed translation for *tok*: "to burn". The context from the Paris Codex is unclear, but the same root appears as **u=to-ka** in C Dr. 36a2, either as a nominal form *u-tok* or a transitive verb with Yukatekan inflection *u-tok-a[j]*. It is followed by *ti chan cha[h]k*, and the vignette shows God B with a burning torch. Other YUK verbal meanings are "tomar, quitar, arrebatar, usurpar, robar, privar" and "defender o librar arrebatando o quitando" (Barrera Vásquez 1993: 803).

601 No satisfactory translation can be given for *tom*. It is either related to CHN *tom*, "to pile up" (Knowles 1984-88) or less likely to a transitive counterpart of the CHL intransitive *tojmel*, "tronar, explotar" (Aulie and de Aulie 1978: 90).

602 Proposed translation for *xoy*: "to bend, to circle". Compare to CHR *xoyi*, "form or bend into a curve or circle" (Wisdom 1950: 653), CHL *xoy*, "dar vuelta" (Aulie and de Aulie 1978: 117), and CHN *xoyän*, "rodear, acorralar" (Keller and Luciano 1997: 290). In CHR, the root *xoy* can also act as a corresponding adjective, but the glyphic example is less likely an inchoative.

603 Tokovinine (2007: 19) considers this spelling to be a nominal derivation as well (see footnote 596). See Chapter 4.1.5 for further consideration. The verbal root was translated as "to appear" (Hull, Carrasco and Wald 2009: 39) by the context of **che-ke=na** < *chek-en* on K793, D2.

Figure 53: Examples of passivations with integrative undeciphered root transitives. **a) ?-ba=ja** (CRN HS. 2 XIV, A2)[604], **b) ?-ka=ja** (PAL T4P1, pB1)[605], **c) ?-tz'a=ja** (TIK MT 356, Ap1)[606], **d) ?-tz'a=ja** (PNG P. Peabody, B3b)[607], **e) FLINT.HAND-la=ja** (COL K4930, A1)[608], **f) ha-?=jo=ma** (CRN HS. 2 1-V, G6a)[609], **g) ^{ja}STONE.HAND^{ma}=jo=mi** (COL K2068, H1-I1)[610].

Spellings with integrating patterns other than schemes 1.a.i, 1.b.i, 1.c.i, or 1.d.i are very uncommon (Figure 54). For root transitives, only two examples of the root *chuk* (see footnote 82) are attested, others only with *il-a* as a non-CVC transitive (see e.g. Figures 57b and 59b, also the graphematic discussion in Chapter 4.2.2.1). After reviewing the CHN linguistic evidence (Tables 6 and), Lacadena's (2004b: fn. 101) proposal to consider a vernacular form is unlikely. If the sequence **ka=ja** should render ***–k-aj*, the presence of the ECh thematic is not in accordance with the CHN *–k-i* [+COM] passive form that utilises an aspect marker to follow the derivational suffix. While the Palenque example could be accounted as a vernacular form, Yaxchilan is too far off the Chontal area. Furthermore, just these

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[604] The same expression is also noted on CRN P. 1, H8. The 'mirror' marking makes the grapheme unlikely to be ZC5 **pi**, and the arched element is unsimilar to 3M9 **nu**, although the 'shiny' marking is shared by both graphemes. But for a potential ***nub* reading, no cognates are found, and the root must remain as CVb.

[605] The unclassified prefix is unique to Palenque and with greater probability a morphograph complemented by **ka** than an unknown syllabic sign. In any case, the root is of a CVk shape.

[606] The example is from an inscribed long bone fragment and followed by another illegible block. The sign broken off could be **pu**, but *putz'* as "needle" (as an inchoative) does not seem to be applicable because of the shape of the bone fragment (Moholy-Nagy 2008: fig. 215f). A possible meaning could be "to escape", related to CHR *putz'e*, "abandon, neglect, ignore completely, make go out or away" (Wisdom 1950: 575), CHL *puts'tan*, "esconder" (Aulie and de Aulie 1978: 75), and CHN *putz'-t-a(n)*, "to escape from s.o." (Knowles 1984-88). If the sign is a morphograph, **tz'a** could either function as a complement for a **CVtz'** sign or signal a *–tz'-aj* mediopassive.

[607] Based on the photo published by Maler (1901: pl. 11), the superfix indeed appears to be **ki**, but *kitz'* yields no lexical evidence except YUK "sucio" (Barrera Vásquez 1993: 322). A **ta** or a **li** sign are likewise possible, but yield no broad lexical support except CHR *tatz'* "straighten out" (Wisdom 1950: 667). This example is also likely different to the one from TIK MT 356 (Figure 53c).

[608] The FLINT.HAND sign MRD is considered as a morphograph. The **la** sign from K4930 together with the spelling **FLINT.HAND-la=ja=ya** from SUF M. 7, B5 is taken as a phonemic complement for a transitive root, compare to the nominalised **ti FLINT.HAND-la** on TIK Alt. 5, 16, and the transitive inflection **u=FLINT.HAND=wa** (Figure 101m). Thus, MRD at least has CVl value, if not even Cal. The **la** is unlikely to be interpreted as part of positional *–laj* suffix.

[609] I refuse Stuart's (2012d) idea that **ha** might underspell the WCh word *hal*, "long time" (cf. Aulie and de Aulie 1978: 39, Keller and Luciano 1997: 125), as this is an adverb that cannot be passivised. Possibly, the block underspells *ha[-i'] [tzu<Ø>tz]-j-om-Ø*, as it precedes *u[h]t-om-Ø* and the then future date 4 *Ajaw* 3 *K'ank'in*, resembling the structure of the final passage of TRT Mon. 6, O2-P4 (cf. Gronemeyer and MacLeod 2010: 8-20).

[610] The STONE.HAND sign MZN has for long been a source of confusion. Based on the affixation, Grube and Nahm (1994: 688-689) proposed ***ham*, but it was not before Grube (2004d) clarified the spirant phonology that the we find evidence for *jam*, see pCh **jäm*, "abrir // open" (Kaufman and Norman 1984: 121), CHL *jam*, "abrir (casa, libro, caja)" (Aulie and de Aulie 1978: 40), and CHN *häm*, "to open" (Knowles 1984-88). Instead of being a separate word, I interpret the next block to provide *–j-om* with *jam*. The future passive verb may refer to the action of *Chahk* who is shown wielding his axe. Furthermore, a personified *kawak* stone is shown splitting a roof, exactly underneath the position of the supposed *ja<Ø>m-j-om-Ø* in the rim text. Questions remain, e.g. the STONE.HAND sign is elsewhere proposed to read **JATZ'** (Grube and Martin 2004: 20, Lopes n.d.). Still unexplained remains its prefixation with **to** (e.g. on K2284, cf. Knowlton [1999] to propose **TOK**) or its derived transitive affixation pattern with **=na=ja** on YAX HS. 2 VIII, Q1 (see Figure 58c). There is a possibility that the sign MZN is polyvalent. The transitive verb *jam* is also discussed as a positional basis among the instrumental derivation (see Figure 152e and footnote 905 for additional linguistic evidence).

two examples also argue against Wald's (2007: 111-115) idea of a **CHUK morphograph being complemented, otherwise it would be used more often with non-integrative spellings (see Figure 55c).

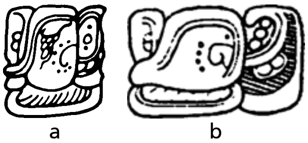

Figure 54: Examples of passivations with root transitives featuring overspellings. **a) chu-ku-ka=ja** (PAL SLAV, E2a), **b) chu-ku-ka=ja** (YAX HS. 3 I, D1).

Only in very few cases is the supposed original harmony pattern of the root retained (Figure 55), resulting in a disharmonic suffix spelling that is not vowel-providing. In most cases, the root spelling is synharmonic, with only a few disharmonic cases, resulting in a spelling **CV$_1$-CV$_1$=ja / CV$_1$C-CV$_1$=ja** or **CV$_1$-CV$_2$=ja / CV$_1$C-CV$_2$=ja** for a *CV$_1$<h>C-[a]j* form, where the vowel of the thematic requires reconstruction in the transliteration. These cases are classified as schemes 2.a.i, 2.b.i, 2.c.i, and 2.d.i. The reconstruction is aided by the ECh linguistic evidence that invariably has /a/ (Table 6) and also especially by altered spellings of other CVC roots (Figures 51 and 52) that deliberately abrogate their original root harmony pattern to spell the suffix vowel.

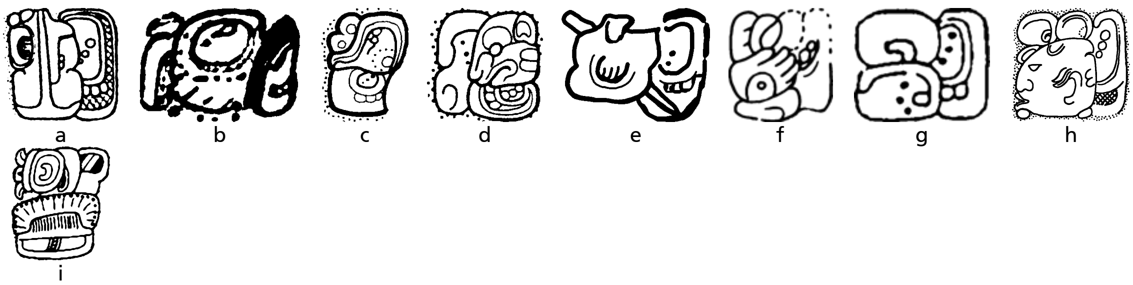

Figure 55: Examples of passivations with non-integrative (dis)harmonic root transitives. **a) ^{2}tzu=ja** (CAY Alt. 4, A2), **b) bu-t'u=ja** (COL K1650, D1), **c) chu-ku=ja** (BPK ScS. 4, D6a), **d) jo-ch'o=ja** (LTI P. 2, A2), **e) JUL^{lu}=ja** (COL K595, P1), **f) K'AL^{li}=ja** (PAL PMI1, A3), **g) mu-ku=ja** (CAY Lnt. 1, C13), **h) pi-tzi=ja** (CRN HS. 2 X, A1)[611], **i) tz'a-pu=ja** (TIK St. 31, O1)[612].

Section 3 of Chapter 3.3.6.2 analyses the distribution of these group 2 spellings, and among passive forms, the few non-integrative spellings seem to be an Usumacinta region phenomenon (Figures 55a, c, d, g), especially among *chuk*, which has a strong trait in the local rhetorics (see Figure 17a). The

[611] The attribution of *pitz* to a lexical class is somewhat problematic. Boot (2009b: 149) lists it as a transitive and positional root, while Lacadena (2003: 853) assumes a noun. The evidence for a positional nature by suffixation with =**la**=**ja** is here considered as the inchoative of a nominalised form (see Figure 69l). Interestingly, no spelling ****pi-tza=ja** is found, which might point to an inchoative ~ *–Vj* derivation (see Chapter 4.1.3). We also find nominal(ised) spellings *ti pitz-Ø* on SBL St. 7, B5 and *aj pitz* on XUL K1547, H1. However, if one thinks of prepositional expressions as *ti a[h]k't-aj-Ø* (see footnote 675 and Figures 71e, 139a-b), it is still possible that *pitz* is nominalised in the aforementioned contexts. I therefore see no objection except the non-integrative spelling pattern to consider a passivised transitive verb.

[612] It is not entirely clear if the sign transliterated here as **ja** is indeed a graphic variant of the sign ZU1. Davletshin (2010: 25) considers the grapheme to represent **la** by comparison with TIK St. 31, P3 and transliterates as **tz'a-la-pu** and deems a Mayan rendering for a Teotihuacan word.

retention of the supposed original harmony pattern also occurs with syncopation (see below), but is without effect for the suffix vowel, as it is deleted.

The significance Houston, Robertson and Stuart (2001b) gave such spellings in favour to support the morphosyllabic model was already statistically denied in Chapter 3.3.6.2. As far as the passive marking is concerned, the many 1.a.i and 1.b.i spellings – and to a lesser extent 1.c.i and 1.d.i – support an important counterargument against morphosyllables, at least for the passive. The full phonemic spelling requires no sign to indicate the suffix vocalisation, which in any case is fixed and fully predictable even in a deficient spelling, such as a morphographic root. The spelling alternation patterns found among passive spellings demonstrate that the third morphosyllabic principle does not apply. The cases of roots retaining their original harmony pattern imply that the scribes were likely aware of the morphemic boundary between root and suffix. But such an analytical spelling was preferably superseded by a spelling that considers the root with all required affixes as one word. In this case, these suffix disharmonic spellings also cannot be used for ***–V'j ~ **–VVj* alloforms, as they are not linguistically attested (also see the discussion about ~ *–Vj* inchoative suffixes in Chapter 4.1.3).

Spellings with just morphographically realised roots (Figure 56) mark the single highest quantity among the passive samples. They result in a spelling **CVC** > **CVC=ja** for a *CV<h>C-[a]j* form, classified as a 2.e.i scheme. As the root is morphographic, no harmony pattern is indicated and no vowel integration takes place. The vowel requires reconstruction in the transcription, based on the linguistic foundations. As with non-integrative spellings involving syllabograms (Figure 55), the vowel can unequivocally be reconstructed as /a/ following the ECh pattern.

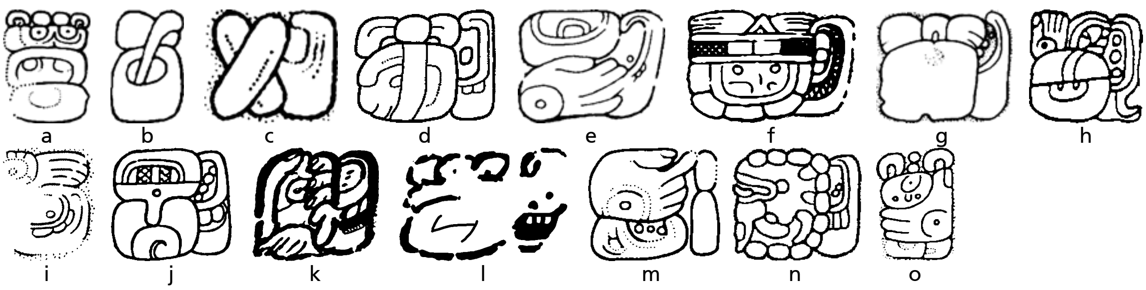

Figure 56: Examples of passivations with morphographic root transitives. **a) 2=STAR.WAR=ja** (PNG St. 12, D13a), **b) CH'AK=ja** (NAR St. 12, B15), **c) JEL=ja** (COB St. 1, M18), **d)** $^{\text{jo}}$**JOY=ja** (MTL St. 1, A8), **e) K'AL=ja** (TPX MV 55, B1), **f) TAN=LAM=ja** (TIK St. 31, A13), **g) ma-AK=ja** (PAL TABL, A2), **h) i PAS=ja** (PAL HCHS, D3a), **i) PAT=ja** (PAL TCB, K2), **j) TUN.SHELL=ja** (PNG Trn. 1, F'4)[613], **k) TZAK=ja** (RAZ K1383, F1), **l)** $^{\text{tz'a}}$**TZ'AK=ja** (MTL K4996, P1), **m) TZUTZ=ja** (ARP St. 2, C1), **n) TZUTZ=ja** (YAX Lnt. 2, C1), **o) ya-AL=ja** (YAX Lnt. 10, A2b).

The passive is the preferred diathesis for some verbs that are frequently recorded. But notably, verbs like *chuk* (see section 4 in Chapter 3.2.2) or *tz'ap* (except the singular sign 1C5 **TZ'AP**, see footnote 593) do no feature a proper morphograph. This observation cannot be explained by rhetorics

[613] The TUN.SHELL verb is usually recorded with the $–V_1y$ mediopassive (cf. Hruby and Robertson 2001: 36-37). The sign ZY1 **yi** is still graphematically present, but without any phonological contribution to the reading. See footnote 854 for further considerations about the graphotactics of **yi** and also the linguistic implications for the passive and mediopassive.

involving the evolution of the graphemic lexicon as primary morphographic (see footnote 88). While the earliest example of *chuk* among the showcases dates relatively late to 9.7 (TZB Mon. 13, A2), the oldest showcase example of *tz'ap* dates to 8.17 (RAZ St. 1, B13)[614]. When comparing the lexical range of passive forms written with syllabograms (Figures 50-55) with those realised by a morphograph, the variety for the latter is less diverse (see Table 74).

When syllabic spellings are a caveat against the necessity of morphosyllables, consistency also must deny them for morphographic root spellings. Even more clearly than among syllabic non-integrative syllabic spellings (Figure 55), such notations distinguish between root and suffix by applying different sign classes for one or the other. The **CVC** and **CV** shape of each sign class necessarily produces a phonological gap in reading. However, each reader aware of the linguistic foundations can 'insert' the correct phoneme (cf. Gronemeyer 2011b: 333). In that sense, passive forms are (almost) always defective and without a sufficient orthographic depth, as they commonly do not orthographically specify the derivational infix. Its indication would normally result in a morpheme-internal overspelling[615].

A few non-CVC transitives that have a stem-formative form the passive as regular root transitives (Figure 57), and not as derived transitives[616]. All examples known from the corpus have a ʔVC-V stem pattern[617]. Their orthographic realisation is basically similar to CVC roots and they would not be discernable from regularly derived ʔVC roots (except an increased use of **=ji** / __# to indicate the thematic). In contrast to CVC-V derived stems, the forms do not find broad discussion in grammars and thus represent a problem for epigraphers.

[614] As Grube (1990a: 44, tab. 3) demonstrated, the syllabic sign inventory was subject to constant change, with new signs innovated while others became deprecated, especially when allographs are concerned (Grube 1990a: 70-72, tab. 4). The same is true for morphographs, for example APN **TZUTZ** is first attested on YAX Lnt. 2, C1 dating to 9.16.6.0.0 (although it is an allograph for MRB first attested in 8.17 on TIK St. 39, Bp6).

[615] Unless a **CVH** morphograph is in place, as with **NAH-wa=ja**, PAL T18S, A5. But even such cases were exercised very infrequently. Such spellings would have represented the next evolutional step in Maya writing to use morphographs as phonographs in a systematic way, and not as a single scribe exhausting the possibilities of the orthographic rules.

[616] The consideration of a verb to be a non-CVC stem is largely based on the pCh reconstruction. As far as the attested ClM examples are concerned, the lexical basis is: **at-*, "bañar // bathe" (while the ClM reconstruction *at-i* bases on epigraphic evidence, cf. Stuart, Houston and Robertson [1999, II: 50] and cognates are usually intransitive, also see Chapter 4.1.19 for transitive perfect spellings), **il-ä*, "ver // see", and **ub-i*, "oir // hear; sentir // feel, notice" (Kaufman and Norman 1984: 116, 121, 135). Missing for pCh is ClM *it-a*, "to accompany" whose stem was convincingly demonstrated by MacLeod (2004: 300-301).

[617] That these verbs behave as ʔVC root transitives is, despite epigraphic evidence, supported by linguistic data. Compare to <*ala ticaba umenel P.ᶜ*> (Morán 1685-95: 50), where the verb can be analyses as *al-a-Ø*.

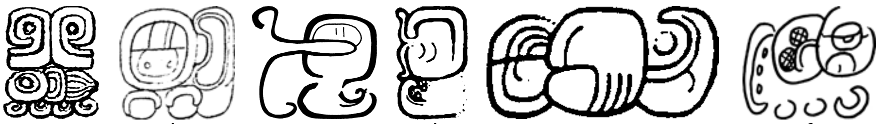

Figure 57: Examples of passivations with non-CVC transitives. **a) AT-ti=ji=ya** (CPN St. 2, D6b), **b) i-la=ja** (CKL Mon. 28, A1), **c) IL=ja** (NTN Dwg. 25, A3), **d) IL=NAH** (MQL St. 3, G3b), **e) i-ta=ja** (CRC St. 22, L13), e) **f) u-bu=ji=ya** (PAL TIJE-R, 4).

The only discussion dedicated to one of these verbs was conducted by MacLeod (2004: 299-300) on *il-a*. She first viewed such spellings (Figure 57b-c) as antipassives and later as transitive perfect participles to harmonise these spellings (and their frequent =**ji** / __# suffixation) with the orthographic patterns she observed for the perfect of transitives (see Chapter 4.1.19). The verb *il-a* is also listed by Lacadena (2004b: 180) as an example for the CHR *–n-a* pattern, where *il-a* behaves as a 'normal' non-CVC verb[618]. Based on the epigraphic evidence, I rather assume that ʔVC-V stems are passivised like regular CVC root transitives, with the exception of the derivational infix [h] > [Ø] (see below on morphophonemics). The verbs under discussion can be written by 1.c.i (as the stem-formative vowel is always disharmonic) or 2.e.i or 2.e.ii schemes. Hence **V_1-CV_2 / V_1C-V_2** > **V_1-Ca=ja / V_1C-Ca=ja** spell *V_1C-aj* forms, and morphographic **V_1C=ja** spellings require vowel insertion as *V_1C-[a]j*.

Transitive stems derived from nouns and other non-CVC transitives, such as of a CVhC root, are passivised by *–n* ~ *–w* (Figure 58) with the thematic *–aj* to follow. The stem-formative suffix *–a* or *–i* (see Chapter 3.1.3.1) are elided in this process. No alteration of the root takes places, as the derivation is achieved by the suffix, and not by an infix as with root transitives (Lacadena 2004b: 179-190).

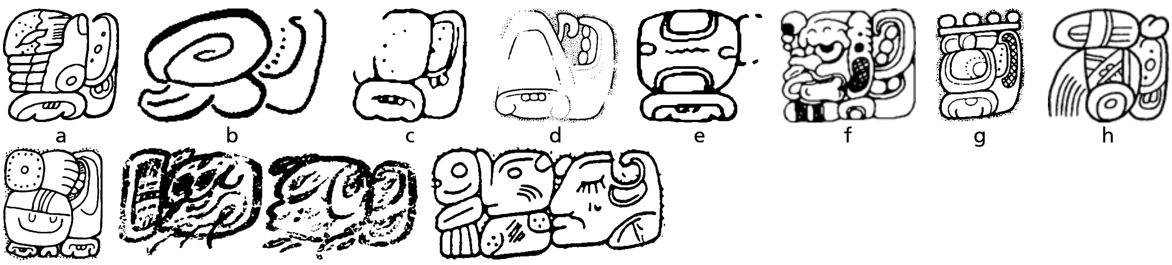

Figure 58: Examples of passivations with derived transitives. **a) GRASPING.HAND=na=ja** (PAL T21B-E, 41), **b) SPIRAL=wa=ja** (UAX Str. B13 R. 7-1, B4), **c) STONE.HAND=na=ja** (YAX HS. 2 VII, Q1), **d) SUGAR.CONE=na=ja** (PUS HS. 1, 8), **e) BAK=na=ja** (TIK T. 1 Lnt. 3, A6), **f) BAK=wa=ja** (TIK T. 4 Lnt. 3, B5), **g) IP=na=ja** (TRT Mon. 6, G7)[619], **h) ki-?=wa=ja** (PAL T21B-E, 40), **i) i PAT=na=ja** (PAL TABL, L2)[620], **j) tz'i-bi=na=ja** (COL K1355, B1-C1), **k) u-xu-lu=na=ja** (CHN MON-L3, A1).

[618] For other instances of the expected pattern compare to CHT <*ubna*> (Morán 1685-95: 149) which can be analysed as *ub-n-a-Ø* 'hear-PASS-THEM'. While this example together with *il-n-a* perfectly follows the ECh pattern, the ClM example (Figure 57f) does not show an orthographic realisation of *–n* and therefore parallels the epigraphic evidence for *il-a*. The only case where a spelling follows the expected derivational scheme is MQL St. 3 (Figure 57d) by a morphographic spelling of the *–n-aj* sequence (with /h/ ~ /j/). In this sense, it is interesting that Sattler (2004: 378) cites a case from CHT, where the subjunctive passive of *il-a* can also be *x-il-ak*, whereas other subjunctive derived and non-CVC transitive verbs in the inscriptions feature *–n* (see Figure 61l).

[619] Also compare to examples without **na** (Figure 72a). Instead of an underspelling, these are rather considered as inchoatives from the original nominal root (see Chapter 4.1.3).

[620] The otherwise positional root *pat* is here passivised as a derived transitive. Compare to Figures 50l and 56i where it is used as a root transitive.

The examples in Figure 58a-d are spelled with an undeciphered morphograph, while Figure 58h is an undeciphered syllabic spelling, but it is assumed these forms represent a derived transitive because of the inflection pattern. With less probability, the **na** and **wa** signs are phonemic complements. Most of the examples were already discussed by Lacadena (2004b) in his seminal study.

No vowel reconstruction is needed, as the suffixation appears at a consonantal morpheme boundary and the syllabic spelling is, unless an underspelling occurs, always integrative and vowel-providing. As the stem-formative is elided, the harmony pattern of the root (if spelled by syllabograms or with a phonemic complement) is supposed to represent the original harmony, which in all cases attested appears synharmonic[621]. Hence we find **CV_1-CV_2** / **CV_1C-CV_2** > **CV_1-CV_1=na=ja** / **CV_1C=na=ja** for *CV_1C-n-aj* or any other applicable pattern, such as **V_1-CV_1-CV_1** > **V_1-CV_1-CV_1=na=ja** for *V_1CV_1C-n-aj*. All these cases can be accounted to scheme 1.f.ii, others are discussed below.

One comment concerns the variability between *–n* and *–w* (see Chapter 4.3.6 for more details). Of the 222 samples of derived transitives, only four use *–w*, all from the central and eastern parts of the Maya area.

The spellings in Figures 50 to 58 all feature a synharmonic suffix spelling[622] by =**ja / __#** which is the significant suffixation pattern for the passive voice (Table 73). Spellings with other =**jV** ~ =**hV / __#** signs or =**AJ** (Figure 59) are extremely rare (see Chapter 3.3.3.1.1). Mostly cases are recorded with the irregular *il-a* (see Chapter 4.2.2.1 for a more detailed review). If the harmony rules are extended to the suffix domain, such a **Ca=ji / __#** pattern would necessitate a transcription ***–aaj* of the thematic, as per harmony rule 1b (Lacadena and Wichmann 2004: 109)[623].

[621] These cases are good support for Mora-Marín's (2003a: 83) hypothesis of synharmonic spellings at consonantal morphemic boundaries (also see footnote 83). The verb *tz'i[h]b-a*, "to write" is a good showcase. Of the 173 passive samples, the majority is written **tz'i-bi=na=ja** < *tz'i[h]b-n-aj-Ø* (Figure 58j). Only 7 cases apply **tz'i-ba** for the stem (also compare to Chapter 4.1.8 for transitive spellings), a clear indication that the factive suffix is elided in this case. Only one case (K758, B1-D1) overspells by writing **tz'i-bi-ba=na=ja**. Interestingly, the example **tz'i-ji-bi=na=ja** (K5364, B1-C1) is clear evidence for the aspirated vowel nucleus (with /h/ ~ /j/). For the verb *ip-a*, "to strengthen" (Figure 58g), we find one syllabic spelling **9 i-pi=na=ja** on PAL T14T, F2, also showing a synharmonic spelling. This is also in accordance with cases of *–yaj* nominalisations (Table 56), compare to **yi-pi=ya-ja** < *y-ip-yaj-Ø* (e.g. CPN St. N, B5-B6) in the name of Copan ruler *K'ahk' Yipyaj Chan K'awil.*

[622] Exception in the illustration selection were made for those examples with =**jV** / … chose, because they are the only applicable samples of this root for this showcase.

[623] As Lacadena and Wichmann (2005b: 36-37) propose a functional differentiation by contrasting harmony patterns and an underlying pronunciation, such spellings should not be considered as a passive, but as a perfect participle in their model (Lacadena and Wichmann 2005b: 35-36), equal to MacLeod's (2004) perfect of transitive verbs. Yet, none of the examples in Figure 59 features 3SG.ERG *u– ~ y–* in the spelling and cannot be transitive. Unfortunately, Lacadena and Wichmann completely do not discuss spellings deviating from the 'norm' (Table 73) and the implications on the pronunciation (see Chapter 4.1.3 for another aspect of suffix disharmonic patterns).

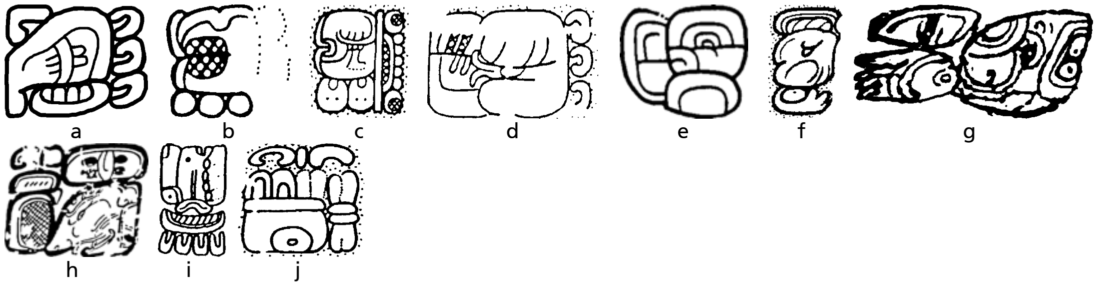

Figure 59: Examples of passivations with suffix spellings deviating from the standard pattern. **a) chu-ka=ji** (COL K503, A5), **b) IL-la=ji** (QRG Alt. L, G2), **c) IL^{la}=AJ** (SBL St. 10, B7) **d) ^{i}IL=ji** (CPN T. 11 WDNP, A4), **e) i-ta=ji** (QRG Zoo. P, 7-A2), **f) ka-cha=ji** (AGT St. 1, A7a), **g) K'AL=ji** (COL K530, B1), **h) tu-ta=ji** (EKB M. 96G, X1), **i) TZAK-ka=ji** (CHN CC-HB, 20), **j) ya-tz'a=hi** (KNK Lnt. 1, D1).

Several forms of underspelling the thematic suffix (Figure 60) can be observed: (1) as a 1.f.i or 1.g.i scheme underspelling of the final thematic (**CV-Ca**=**Ø** / __# < *CV<h>C-a[j]* or =**na**=**Ø** / __ # < *–n-a[j]*), but with the vowel provided (Figure 60a-p); (2) a complete underspelling among a morphographic root (**CVC**=**Ø** / __# < *CVC[-aj]*) as a 2.g.ii underspelling (Figure 60q-r); or (3) an underspelled root or derivational morpheme, but with the syllabogram indicating the suffix (**CV**=**ja** / __# < *CV<h>[C]-[a]j* or =**Ø**=**ja** / __# < *–[n]-[a]j*) written as schemes 2.g.i and 2.g.ii (Figure 60s-x).

As discussed in section 2 of Chapter 3.3.6.2, **CV-Ca** spellings are significant for the codices, but also appear with greater frequency in Yucatan than elsewhere. The linguistic hypotheses speculated on the morphophonemics of the thematic suffix as *–a'* ~ *–a* / __# that may represent an ECh language change. As the Yukatekan passive is *–b-i* [+COM], and the codices were written in a diglossia situation, it is unlikely that such spellings represent the reflection of spoken ECh. As still many other examples in the codices and elsewhere in Yucatan are written with =**ja** / __#, it is good evidence that these cases are simply underspellings, also in comparison with other verbal inflections (see Chapters 4.1.8 and 4.1.10).

By the abundance of =**ja** / __# and other =**jV** / __# suffixation patterns, it is almost self-evident that these spellings also indicate the thematic allomorph *–aj* / __#. However, with respect to the argumentation regarding the transitive marker that =**wa** / __# only serves as an orthographic marker for a $-V_1$ / __# suffix (see Chapters 3.1.3.1 and 4.1.8), more evidence is needed to support the *–aj* pronunciation of the thematic suffix. This is even more the case as we have passive spellings with =**a** / __# (Figures 60c, 60h) that could be taken as support for rare cases to indicate *–a'* or just *–a* / __#. But with just these two examples in the corpus, it is hard to build an argument[624]. Chapter 3.3.6.2 demonstrated that underspellings alone do not provide significance to speculate on a missing final consonant, so linguistic support is needed to be compared against the epigraphic evidence. The answer lies among non-syncopated thematic markers with other suffixes to follow.

[624] This is even more the case when reasoning for ECh vernaculars, as the example from the Holmul stucco frieze dates from the reign of *Aj Wosal* of Naranjo and thus cannot postdate 615 AD. An Early Classic dating from a Central Peten site is not supportive to vernacular features that first become evident in Late Classic Copan, but may reflect an earlier dialectal form.

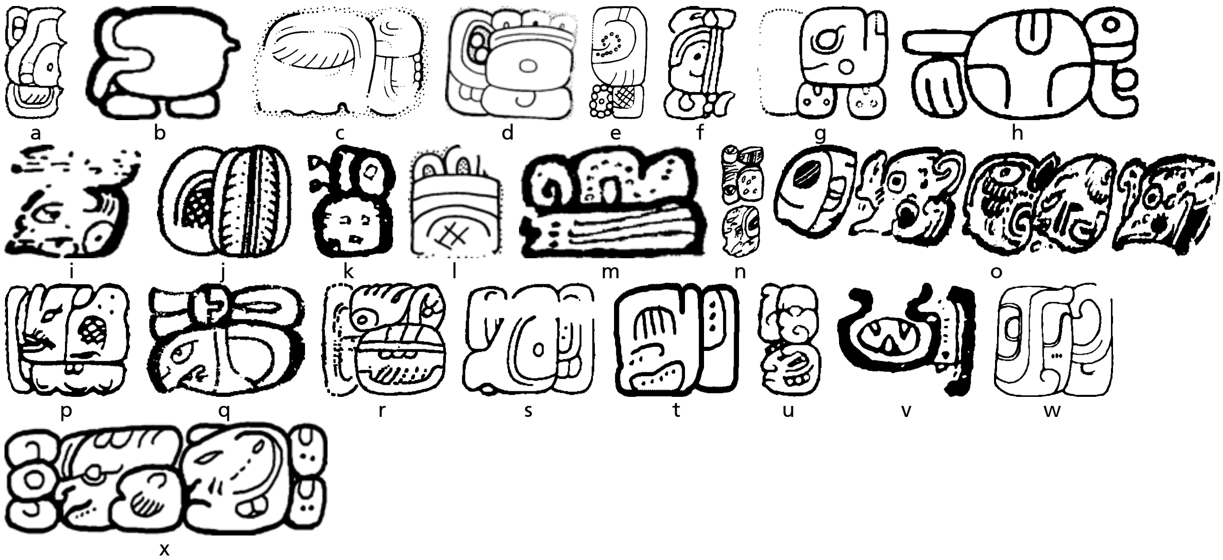

Figure 60: Examples of passivations with different underspellings. **a) chu-ka** (YAX Lnt. 16, A2a), **b) IL-la** (PNG P. DOAKS1, J6a), **c) IL**^{la}**-a** (DPL P. 7, B4), **d) ja-tz'a** (NAR Alt. 2, C4), **e) jo-ch'a** (ITN St. 17, K2a), **f)** ^{jo}**JOY-ya** (SBL St. 7, A2a), **g) i k'a-la** (SBL St. 4, A3), **h) ma-cha=a** (HLM Frz. 1, pA18), **i) ma-ka** (EKB Cst. 18, B1), **j) pa-sa** (CPN St. J, E 29b), **k) si-na** (C Ma. 102c), **l) tz'a-pa** (YXP St. 3, Cp1), **m) wi-sa** (C Ma. 40a), **n) u=tz'i-bi=na** (COL K5366, L3-L4), **o) u=tz'i-ku=na=li** (COL K530, E1-H1)[625], **p) u-xu-lu=na** (CHN T4L-L4, A2), **q) JOY** (C Dr. 23b), **r) YAX PAS CHAN** (CPN Alt. G, B4), **s) chu=ja** (YAX St. 18, A4), **t) k'a=ja** (COL K2292, B1), **u) mu=ja** (QRG Zoo. G, J'1b), **v) se=ja** (C Ma. 108c), **w) tzu=ja** (PMT P. 1, pL5), **x) yu=xu-lu=ja=la** (COL K6551, C1-D1).

Before coming to speak to cases with suffixes following the thematic, it is apt to discuss the morphophonemics of the infix. Lacadena (2004b) reconstructed *<h>* as the sole infix based on the linguistic evidence (see Table 6). Also, TZE has *<h>* as the only allomorph (Kaufman 1971: 54). I find it necessary to consider allomorphs under specific circumstances: (1) with any C_1VC_2 root, where C_1 or C_2 belong to a certain manner of articulation; (2) with the root being ʔVC as a special case thereof; (3) with the infix preceding a consonantal cluster, i.e. a syncopated thematic (the rational to syncopate provided below). A form like **JOY=ja** (e.g. PNG St. 8, E3) as *jo<h>y-[a]j-Ø* still could easily be pronounced as **[xoh.jax], but consider a spelling like **JOY=ji=ya** (e.g. PNG P. 3, A'1) that with a strict paradigmatic transcription results in ***jo<h>y-j-Ø=iy*, pronounced as a problematic **[xohj.xij]. In fact, one CHR grammar (Ch'orti' 2004: 138) provides a clue by explaining that the infix has an alternant <'> to be used "en algunas palabras." Without providing any description or example, it is worth to review general phonemic patterns in Ch'olan languages.

Not all consonants are likewise suited to appear in a consonant cluster within one syllable. However, the juxtaposition at a C.C border is probably less of a concern, but more what consonants [h] must not precede in a CVhC nucleus[626], at least as far as canonical forms from the lexicon are con-

[625] The spelling exhibits a plain scribal error by substituting the regular **bi** sign with **ku**. But the spelling of the suffixes can be taken as an indication for **u-tz'i[h]b-n-a[']-[a]l* with a debuccalisation [j] > [ʔ]. We also find some examples that spell **=na=ha=lV** (e.g. MTL K1728, E1-G1, MTL K3120, G1-H1), also compare to **tz'i-ba=NAH=la** in Figure 61k. Whether this the indication of a lenition process or just the result of the loss of the orthographic distinction between the spirants must remain unanswered by these few examples. But given only a handful of cases, the example from K530 in this sense rather appears to be an underspelling for *u-tz'i[h]b-n-a[j]-[a]l.*

[626] The investigation is biased by the fact that all modern Ch'olan languages have lost the distinction between

cerned. Any passivised CVC root with the thematic *–aj* / __# can be syllabified into *[CVh.Cax]. Still, the <*h*> infix might morphophonemically change when the next syllable has a certain consonantal onset that was previously the root syllable coda. Based on the phonological evidence, as data for such a clustering are scant or absent in pCh and modern Ch’olan descriptions, /h/ likely takes an allophonic value / __{t’, k’, ’, s, x, j, h, w, y}, or generally / __[±STOP,+FRICATIVE,+GLIDE]. This assumption is also supported with the CHL passive pattern, where <*h*> does not occur / __{’, s, x, j, y, Č} (Table 6), but *–le(y)* is used[627]. With the CHR <’> alternant, I propose this form to be used in ClM under the above conditions, hence it is more likely **JOY=ja** < **jo*<’>*y-aj-Ø* as *[xoʔ.jax] or **su-sa=ja** < **su*<’>*s-aj-Ø* as *[suʔ.sax] (see footnote 599). Depending on the infix alternant, the syllabification either results in CVh.CVC or CVʔ.CVC. Considering the tentative nature of this phonological reconstruction, <*h*> is retained as the conventional notation of the passive infix in all transcriptions of Appendix C3.

Regarding ʔVC roots and stems, an infix might be possible from a phonological point of view. It would result in a *[ʔVh.Cax] or *[ʔVʔ.Cax] syllabification that does not necessarily contradict a canonical form (Table 3). But it seems likely – though speculative – that [h] > [Ø] / ʔV__, hence I would analyse **IL=ja** < *il-[a]j-Ø* as *[ʔi.lax]. Additional morphophonemic processes of the infix may appear with the syncopation of the thematic suffix (see below).

Before investigating these cases, I will further discuss derivations or inflections of passive forms with **=jV** /… < *–aj* that appear without syncopation (Figure 61). The epigraphic record provides four environments: before (1) possessive marking with *–al* (Figure 61j-k, m-n); (2) the subjunctive passive with *–ak* (Figure 61l); (3) the temporal deictic enclitic after certain ʔVC roots or stems with *=iy* ~ *=ij=iy* (Figure 61a-d); and (4) the enclitic with regular CVC roots with ~ *=ij=iy* (Figure 61e-i).

To begin with the first two instances, in any case, no syncopation occurs with non-CVC and derived transitive passives that take the thematic in secondary position after the *–n* ~ *–w* suffix. Otherwise, an impossible cluster of three consonants would appear, e.g. ***u-tzi[h]b-n-j-al.* Unless underspellings occur, all these cases are always vowel-providing by their syllabic nature as a 1.f.ii scheme. The general tendency is to apply a **jV** / … sign that provides the vowel of the suffix to follow. Such cases have been taken as evidence to reconstruct pCh **–aj* (Kaufman and Norman 1984: 108), but they also help to proof that the ClM form was not only *–aj* / …, but also *–aj* / __# (although it might be possible that in certain dialects *–a’* / __# was possible and sometimes recorded, see footnote 624).

[h] and [x]. Thus only data with [x] are available, except for pCh. The reconstructed pCh cases for medial /h/ (cf. Kaufman and Norman 1984: 144) do not provide examples for / __{t’, ’, ch, s, x, j, h, w}, although the reconstruction may only provide a fragmentary picture. In CHL (cf. Schumann Gálvez 1973: 13), the velar spirant does not appear / __{’, tz’, s, x, j, n}. In Colonial CHN (cf. Smailus 1975: 186-187), the velar spirant is not described / __{p, t’, k’, ’, tz’, ch, ch’, j, n, l, y}, although the Colonial data may not provide a full picture. If an impossible combination occurs, C_1 > [Ø] / __C_2. For modern CHN (Knowles 1984: 60), we have [h] > [Ø] / __{’, x} attested. In CHR (cf. Fought 1967: 90), there is no attestation for the velar spirant / __{b, t’, k’, ’, x, j, w, y}.

[627] Kaufman and Norman (1984: fn. 11) thus reconstruct the pCh passive as *<*h*> and not as *<*j*>, as they consider CHL [j] > [Ø] / __[+SPIRANT] when the distinction between /h/ and /j/ in CHL got lost. While this process is certainly true for CHL, it does not necessarily imply that the ClM <*h*> was not subject to morphophonemic change.

Kaufman and Norman (1984: 108) cite several cases of CHT derived passive forms with *–n-ah-el* [+INC], which they take as an argument to reconstruct pCh **–aj*. However, such a form is not uniformly applied by Morán; and Sattler (2004: 377-378) in her grammatical treatise cites several cases, where the suffixation is simply *–n-a-el*[628]. But *–n-ah-el* is a necessary morphophonemic alteration, as it has to prevent a vowel hiatus with another *–VC* suffix to follow, and all CHT examples of a word-final thematic are written simply as *–a*. Some examples of root passives show vowel assimilation with *–a-l* < ***–a-el* [+INC] and *–a-k* < ***–a-ik* [+SBJV], the latter also attested with derived transitives with *–n-ak* < ** *–n-a-ik* [+SBJV] (and not ***–ah-ik* or ***–n-ah-ik*). These examples are good evidence that we find *–a* / __# ~ *–ah* / __V as the thematic allomorphs in CHT. When comparing this with the epigraphic examples, we obtain the subjunctive always written =**na**=**ja**=**ki** < *–n-aj-ak* (Figures 61l). This is sufficient evidence to support a ClM thematic *–aj* / __#, if it were generally ***–a'* ~ ***–a*, then vowel assimilation would occur, indicated by a **=**na**=**ki** spelling[629]. The possibility that ClM had an allomorph ** *–a* / __C (see footnote 163) can therefore be rejected. Possessive marking with a *–Vl* suffix (Houston, Robertson and Stuart 2001b: 9-10) is mostly attested with the derived transitives *tz'i[h]b-a* and *uxul*, where regularly a grapheme string =**Ca**=**ja**=**lV** < *–C-aj-Ø-al* indicates the thematic suffix (note the intermediate *–Ø* nominalisation, see Chapter 4.1.9). Such cases all follow a *[ʔu.CV(h)C.na.xVC] syllabification, e.g. *u-tz'i[h]b-n-aj-Ø-al* as *[ʔu.t͡s'ihb'.na.xal] or *uxul-n-aj-ik-Ø* as *[ʔu.ʃul.na.xik].

Another question concerns the temporal and spatial distribution of *–w-aj* in contrast to the more common *–n-aj* as a general ECh suffix. As only CHR has grammatical evidence for *–w-aj*, it is supposed to be an innovation and thus vernacular (Lacadena and Wichmann 2002: 302, fn. 19). But examples appear in the Central Peten already in 9.0 (Figure 58b) and 9.15 (Figure 58f), before one attestation can be made in the Motagua region (Figure 61n) by 9.17. The *–w-aj* suffix is therefore a genuine ECh alternant that only survived in CHR.

The other instances involving the temporal enclitic(s) are more diverse in their morphophonemics. While the thematic suffix is generally supposed to syncopate when a temporal enclitic follows a regular CVC roots and stems (Figure 62), the situation with ʔVC roots and stems is not overly clear. Such roots do not necessarily need to syncopate the suffix vowel, but the data are not very broad. A 1.e.ii case like **ⁱIL**=**a-ji**=**ya** (Figure 61c) is best support for *il-aj-Ø=iy* as *[ʔi.la.xij][630], equally spellings like **IL-la**=**ja**=**ya** < *il-aj-Ø=[i]y* (JAI P. 1, A1) or **ⁱIL**=**a**=**ya** < *il-a[j]-Ø=[i]y* (CPN HS. 1 XXXV, H1)

[628] For example <*yual itzatzbunael camenel*> as "sois ayudados por nosotros" (Morán 1685-95: 50), but also with completive forms, when any other pronoun than 3SG.ABS is following, such as in <*alnaet ti belen*> (Morán 1685-95: 67-68) as "you were born in Bethlehem". However, it is not uncommon that intervocalic /h/ is not represented in the manuscript.

[629] Unfortunately, we only have six examples of passive forms in the subjunctive, but all spell with =**na**=**ja**=**ki**. All these examples are with *uxul* and originate from Chichen Itza. Assuming a certain conservatism among Ch'olan derivations and inflections in the area of spoken pYu, this is even more proof for the ClM *–aj* suffix in word medial and final position. The subjunctive is also helpful to prove the *–aj* vocalisation of other functions, such as the inchoative (Figure 74).

[630] Such analysis and syllabification would also support the proposed [h] > [Ø] / ʔV__ shift of the passive infix. If this process would not take place, the result would be **[ʔih.la.xij] and violate the canonical forms (Table 3), reflecting a **[CVh.CV.CVC] shape with the open heavy syllable not in second to last position.

that specifically provide the vowel of the thematic[631]. The case of **IL=ji=ji** (Figure 61d) is slightly different, as the two **ji** signs indicate the ~ *=ij=iy* alternant. But in comparison with other CVC roots (Figure 61e-i), *il-[a]j-Ø=ij=i[y]* is likewise implied as a quadripartite syllabification *[ʔi.la.xi.xij].

Some CVC roots feature a complex suffixation pattern of **=ja=ji=ya** (Figure 61f-g, i) which at first sight appears as an overspelling of the **=ja** sign when compared with the examples in Figure 54, as such implying syncopation[632]. But more likely, the graphemes must be considered to denote individual morphemes each, then undoubtedly the ~ *=ij=iy* enclitic alternant is indicated. The question of the morphophonemics of both the infix and the thematic remain difficult, but a *CV<Ø>C-aj-Ø=ij=iy* form remains the most plausible from phonetic and graphematic viewpoints for a quadripartite *[CV.Ca.xi.xij] syllabification[633]. The provision of a **Ca** syllable in Figure 61g is also in favour for a regular *–aj* thematic, rather than being a phonemic complement. Among the inchoative, we also find a few **Ca=ja=ji=ya** suffixations (Figure 74d) where the root spelling also supports a regular *–aj* suffix in case the enclitic is ~ *=ij=iy* (see Chapter 4.1.3 for the rationale), also a **=ji=ji=ya** sequence among perfective transitives (Figure 172d-e)[634]. The spelling of ~ *=ij=iy* is also provided by similar spellings, such as **JOY=ji=ji=ya** < *jo<Ø>y-[a]j-Ø=ij=iy* (Figure 61e) or **K'AL=ja-ji=ji** < *k'a<Ø>l-[a]j-Ø=ij=i[y]*

[631] This tendency is also observed with perfective spellings of *il-a*, where no syncopation is also implied, compare to **yi=li=a-ji=ya** < *y-il-aj-Ø=iy* (Figure 172b). See Chapter 4.1.19 for more details.

[632] When the **ku-ka** sequence in Figure 54 serves the purpose to provide a root-harmonic and suffix vowel-providing spelling simultaneously, a similar principle can be assumed as a possibility for the **ja-ji** sequence. As such, the **ja** sign would provide the graphematic indicator for the thematic and otherwise remains mute, while the **ji** spells the syncopated thematic and provides the vowel for the following enclitic. An example as in Figure 62f could thus be transcribed and analysed as ***jo<Ø>y-j-Ø=iy*. The same line of argumentation surely applies to selected identical spellings with other suffix functions. For the intransitive positional spelling **i CHUM**^{mu}**=ja-ji=ya** (Figure 68e), the transcription is *i['] chu<h>m-j-Ø=iy* (see Chapter 4.1.2), as the synharmonic complementation at the morphemic boundary does not indicate the *–aj* suffix, but its vowel syncope (see Chapter 4.1.3 for a full discussion).

[633] The argument can be made on the basis of canonical forms. For example, the case of **JOY=ja=ji=ya** in Figure 61f can be analysed in several ways: (1) as ***jo<'>y-[a]j-Ø=iy* for a **[xoʔ.ja.xij] form with a regular, but overspelled suffix; (2) as ***jo<Ø>y-j-Ø=[i]j=iy* for a **[xoj.xi.xij] form with a one-to-one grapheme and morpheme correlation and syncopation; or (3) as *jo<Ø>y-[a]j-Ø=[i]j=iy* for a *[xo.ja.xi.xij] form without syncopation. The first alternative with ~ <'> among a non-syncopated suffix would result in a syllabification that is otherwise only forced by the passive of derived transitives, likewise the second one with ~ <Ø> among a syncopated suffix (see discussion in relation to Figure 62). A comparison with roots that take the regular <*h*> infix reveals another issue for the first option, e.g. by **ma-AK=ja=ji=ya** in Figure 61i as ***ma<h>k-[a]j-Ø=iy* for a **[mah.ka.xij] form. Such form is viable, as an open heavy CVh syllable (see footnote 35) may appear not only in second to last position, as demonstrated by **u-ti=ji=ya** < *u[h]t-Ø=ij=iy* (CPN Alt. F', C1) as *[ʔuh.ti.xij]. Therefore, an analysis following the first segmentation would be inconsistent among the infix alloforms and is thus unlikely. The third alternative with ~ *=ij=iy* remains the only option with a canonical syllabification under two premises: (1) the first suffix to the root does not syncopate; and (2) both infix allomorphs <*h*> ~ <'> have to undergo the <*Ø*> change normally triggered by vowel syncope for consistency, also in comparison to ʔVC roots. Evidence for the first assertion comes from outside evidence with a full phonemic spelling, such as the example from CPN Alt. F' and with **HUL-le=li=ji=ya** < *hul-el-Ø=ij=iy* as *[hu.le.li.xij] another from the same text (CPN Alt. F', A3b).

[634] The first **ji** sign is less used for an integrative spelling for the following enclitic, but because **=ji / __#** is the standard suffixation pattern for the perfect. Note that in many cases of the passive (Figure 61f-i) and the inchoative (Figure 74c-d), **=ja / …** is retained as the graphemic marker of the *–aj* suffix, even when it is not an integrative grapheme change for the following morpheme. As such, **SIH-ya=ja=ji=ya** (Figure 74d) indicates *si[y]-aj-Ø=[i]j=iy*, while **u=KAB=ji=ji=ya** (Figure 172e) indicates *u-kab-[a]j-Ø=ij=iy*.

(Figure 61h)[635]. Only in the latter case we must indeed consider an overspelling of the thematic. The alteration of *=iy ~ =ij=iy* is in graphematic and linguistic accordance with the paradigm (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999), as both forms are alternants when referring to an anterior event (Wald 2004b: 243). Their applicability is less determined by the analytical step from the transliteration to the transcription and thus by the epigrapher, but must be correlated to the canonical syllabification[636].

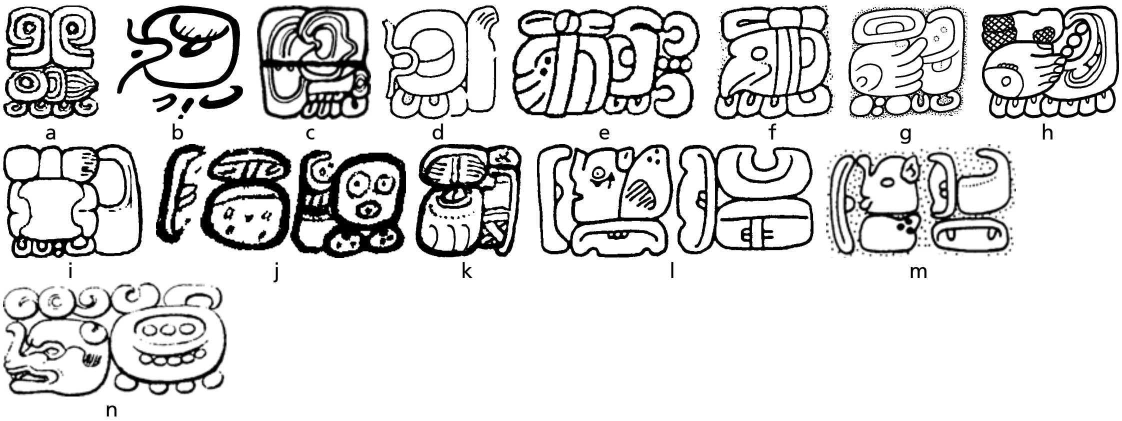

Figure 61: Examples of passivations with a non-syncopated thematic suffix in non-final position. **a) AT^ti=ji=ya** (CPN St. 2, D6b)[637], **b) IL=ji=ya** (NTN Dwg. 24, A3), **c) ^iIL=a-ji=ya** (PAL TI-W, J1), **d) IL=ji=ji** (CLK St. 33, G5), **e) ^jo JOY=ji=ji=ya** (CPN Alt. F', B3a), **f) JOY=ja=ji=ya** (CLK St. 33, F3), **g) K'AL-la=ja=ji=ya** (TNA Frg. 37, Ap2), **h) K'AL=ja-ji=ji MAY** (PAL PT, E8), **i) ma-AK=ja=ji=ya** (PNG St. 8, B19), **j) u=tz'i-bi=na=ja=la** (XUL K3743, C1-D1), **k) tz'i-ba=NAH=la** (COL K2695, Q1), **l) u-xu-lu=na=ja=ki** (CHN T3L-L3, B2-C1), **m) u-xu-lu=na=ja=la** (CHN TIS-LU, C3-D3), **n) yu=xu-lu=wa=ja=la** (CPN Alt. Z, C1-D1).

Spellings with =**jV** / … and a syncopation of the thematic to *–j* / … (Figure 62) all classify as scheme 2.f.ii because of the absence of the vowel. When investigating the subject of syncopation, two questions must generally be asked: (1) how do root spellings behave, and (2) under which circumstances do syncopations occur? The phonemic process is not backed up by linguistic data, but only inferred by general phonological reasons (Lacadena 2004b: 167)[638]. The line of argumentation for the

[635] MacLeod (2004: fig. 11.24) considers only one **ji** sign to provide *may[i]j* and accordingly transliterates as **K'AL=ja MAY=ji**. However, note that the bulges of **ji** slightly overlap under MR2 **K'AL** and ZU1 **ja**, indicating two graphemes rather. As a noun, it is likely that the root was only may (see footnote 945).

[636] Compared to the 68 passive samples with supposed syncopation of regular CVC roots, 4 feature the **ja-ji** / **ja=ji** sequence, and 1 case has **ji=ji**. This number is lower than among the inchoative (footnote 688), but higher than among the perfective (footnote 951). The smaller number in comparison to the inchoative is a sign that the alteration was not so much favoured among the passive.

[637] The spelling of the stem *at-i* is provided by **AT^ti**. As it is unlikely that a thematic ***–ij* as a contraction with the usative *–i* is indicated, we must assume a suffix underspelling and reconstruct as *at-[a]j-Ø=iy*. If the spelling was to indicate syncopation, I would expect either no phonemic complement to the stem or a synharmonic spelling with **ta**, see Figure 62w for a similar case with the stem *ub-i*.

[638] The author refers to "[…] a general morphophonological rule according to which a –VC suffix is reduced to –C- when followed by another VC suffix […]." In a later paper, Lacadena and Wichmann (2005b: 19) state more precisely that "[…] pretonic syllables tend to syncopate […]." The origin of this suffix domain syncopation is possibly related to the pCh reconstruction that stem-internal syncopation occurs with derived transitives to keep stems bisyllabic (Kaufman and Norman 1984: 86). But the epigraphic evidence indicates that the morphophonemics are more complex, as the cases of a non-syncopated vowel (Figure 61) show. The rule of another *–VC*

showcase can only be succeed by epigraphic evidence. As it was demonstrated above (Figures 51 and 52), synharmonic CVC roots regularly alter their spelling from **CV_1-CV_1** to **CV_1-Ca** to provide the suffix vowel, as do disharmonic **CV_1-CV_2** spellings.

Mora-Marín (2003a: 27, 29) was the first to propose that synharmonic spellings (Figure 62b-c, e, h, i, k-m, p, r, u-w) may indicate syncopated forms (see footnote 37), although this may not necessarily be the case (see Chapter 4.1.17 regarding the instrumental suffix). In the supposed case of vowel deletion, disharmonic spellings may also occur (Figure 62g), and morphographic root spellings can be used (Figures 62a, d, f, j, n-o, s-t, x). Full syllabic spellings are clear cases to for comparison, while those with an alleged syncopated suffix bordering a morphographically written lexeme are not necessarily decisive, as spelling group 2 may apply[639].

Excluding the CaC roots, only one sample among the 2.f.ii cases shows a disharmonic root spelling (Figure 62g). It may raise the question if **k'u-xa** is the root harmony pattern for *k'ux*, likewise if other non-integrative root disharmonic spellings (Figures 55f, i)[640] are take into account. Among other CVC roots, *chuk* provides a strong argument. Only very few non-integrative **chu-ku=ja** spellings (Figure 55c) occur in the inscriptions, all from the Usumacinta region. All 12 examples with a supposed syncopated thematic are spelled **chu-ku=ji=ya** and also originate from sites outside the Usumacinta basin, also compare to **mu-ku=ja=ya** < *mu<Ø>k-j-Ø=[i]y* (Figure 62h). Furthermore, the frequency of morphographs among 2.f.ii spellings is 52.9% (or 36 samples out of 68, of which only two are complemented), compared to the overall ratio of 41.6% among all passive examples. Another intriguing example is **u-bu=ji=ya** (Figure 62w) whose synharmonic spelling cannot provide the stem-formative vowel of *ub-i*[641]. Any 'regular' spelling with **=ji=ya** and vowel syncopation of the thematic results in a bisyllabic *[CVC.xij] form, e.g. **chu-ku=ji=ya** < *chu<Ø>k-j-Ø=iy* as *[ʧuk.xij].

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suffix to trigger syncopation is also supported by the cases of the ~ *=ij=iy* enclitic. Apparently, a *–VC-VC* suffix sequence abrogates the necessity to syncopate.

[639] An example is **u=WAY=bi=li** (Figure 153h) as likely *u-way-[i]b-il* or possibly *u-way-b-il*, with the latter sometimes found in the literature (e.g. Boot 2009b: 200) One of Mora-Marín's (2003a: 27, 29) synharmonic examples is **yo=ko=bi=li** (Figure 154), considered to spell *y-ok-b-il*. If syncopation is attested in an identical suffix string among several roots, than it is possibly, but not necessarily applicable to all cases. However, as Chapter 4.1.17 demonstrates, no linguistic data actually prove that the *–Vb* instrumental has its vowel deleted when another *–VC* suffix follows, but it is always *–Vb-VC*. The argumentation simply by epigraphic reasons must be taken with special care, especially when linguistic data are absent; as the meticulous dissection of spellings indicating no syncopation among the passive, inchoative and perfect shows.

[640] The case of the **tz'a-pu=ja** spellings remains problematic, as there are other reading proposals. All three cases of *tz'ap* with a syncopated thematic (CPN T. 22a Stone, B5, CPN St. A, B3a, QRG St. I, C3a) spell the root synharmonically as **tz'a-pa** (Figure 62u). As the Tikal example remains unique, other parallel examples would be needed to firmly support a disharmonic pattern. If *tz'ap* would indeed have an underlying disharmony, this would cause a shift of 77 passive examples from scheme 1.a.i to 1.c.i, also 25 examples among showcase 2IND.

[641] This example is further viable support for the idea of synharmonic spellings at [C.C] boundaries. It also refuses MacLeod's (2004: 299-300) idea that such non-CVC spellings are perfect participles. As the stem-formative suffix *–V* and the *–ej* perfect suffix assimilate to *–Vj* (see Chapter 3.1.7), the participle would be **ub-ij-Ø=iy* and request an ***u-bi=ji=ya** spelling. If the example from PAL TIJE-R, 4 is not a spelling group 2 example for **ub-[a]j-Ø=iy* (parallel to **AT^{ti}=ji=ya**, Figure 61a), then ʔVC roots and stems either (1) syncopate the thematic case by case as an optional process, or (2) it depends on the etymon whether syncopation takes place or not (in combination with the final consonant?).

The above examples of syncopated thematic suffixes provide a zero allomorph of the infix in the transcription. When syncopation occurs, I assume another morphophonemic process to take place. Boot (2009b: 65, 150) was the first to suspect that syncopation causes [h] > [ʔ] / __CC. But his proposal fails to comply with syllabification, as neither **[CVʔ.CCVC] or **[CVʔC.CVC] is possible (see footnote 35 on the absence of [Vʔ] nuclei in ClM). It is more likely that we face the process [h, ʔ] > [Ø] / __CC for the infix, as Kaufman and Norman (1984: 86) provide evidence for a general deletion of /h/ before consonant clusters in all Ch'olan languages that also must be valid for the <'> infix to avoid impossible syllables. All roots with a syncopated thematic suffixes with another *–VC* suffix to follow thus result in a bisyllabic CVh.CVC form.

Figure 62: Examples of passivations with a syncopated suffix in non-final position. **a) CH'AK=ja=li** (XLM P. 7, C1), **b) CH'AK**$^{\mathbf{ka}}$**=ji=ya** (QRG Zoo. G, L'3b), **c) chu-ku=ji=ya** (CNK Trn. 1, K1), **d) JEL=ji=ya** (PAL TS, D16), **e) jo-ch'o=ji=ya** (PAL UNKW, gly14), **f) K'AL=ja=ya** (QRG St. J, F4), **g) k'u-xa=ji=ya** (TNA Frg. 1, A1), **h) mu-ku=ja=ya** (PNG P. 12, O4), **i) pa-k'a=ji=ya** (CPN Alt. F', A2a), **j) PAS=ji=ya** (PMT P. 96G, A2), **k) pi-tzi=ji=ya** (YAX HS. 2 VIII, A2)[642], **l) pu-lu=ji=ya** (CHN CC.HB, 30), **m)** ^{2}**tu=ji=ya** (BPK ScS. 5, L5), **n) TZAK=ji=ya** (YAX Lnt. 25, M1), **o) TZAK=ja=na** (YAX HS. 3 V, D7), **p)** ^{2}**tzu=ji=ya** (PMT Mon. 8, pD1), **q) TZUTZ=ja=ya** (CLK St. 89, D6), **r)** ^{2}**tzu=jo=ma** (TRT Mon. 6, O2), **s) TZUTZ=jo=ma** (YAX Lnt. 31, K5), **t) TZUTZ=ho=ma** (PAL HCPD, M-1), **u) tz'a-pa=ji=ya** (QRG St. I, C3a), **v) tz'a-ya=ja=la** (PAL T18S, 176b), **w) u-bu=ji=ya** (PAL TIJE-R, 4), **x) ya-AL=ji=ya** (PAL TI-W, O11).

Most cases of syncopation, as discussed so far, appear with the temporal deictic enclitic *=iy*, typically resulting in a =**ji**=**ya** spelling[643]. The second largest group appears with the future participle *–om* (Schele and Grube 1988), characterised by the syllabogram sequence =**jo**=**ma**[644]. There is one

[642] The reading is not clearly supported by the drawing, but the original monument backs the transliteration provided here.

[643] For the *–aj* thematic and *–laj* of intransitive positionals, Houston, Robertson and Stuart (2000: 329) assume a lenition process [x] > [h] / __*=iy*. They do not take a vowel syncope into consideration, but I think the examples in Figure 62 do not support a lenition by their regular application of =**jV** / …, and in fact, no case of **=**hV** / … has been sampled. I am not aware of any **=**la-hi**=**ya** spelling among intransitive positionals, but these are pending a systematic survey.

[644] One example features **TZUTZ**=**jo**=**mo** (NAR Alt. 1, K6-J7), which by the contemporary date 9.8.0.0.0 cannot be taken as an example to argue for a loss of harmony patterns (Houston, Stuart and Robertson 1998: 284-

example (Figure 62a) with the *–Vl* adjectiviser, and another case (Figure 62o) with *–an* of uncertain function, possibly a participial form[645].

Several selected debatable cases which were attributed to spelling group 4 deserve further discussion (Figure 63). With respect to *tz'i[h]b-a*, there are very few examples that simply spell **tz'i-bi** (Figure 63d) without suffixes to follow (compare Figures 58j and 61j-k). Likewise, some cases simply indicate **na=ja(=la)** (Figure 63e) alone are transposed to other positions in the PSS (see footnote 102), a phenomenon already recognised by earlier studies (e.g. Grube 1991: 228-229). I see no firm evidence to believe that there is a general nominal compound relation with grammatical forms that would in full transcribe as *u-tz'i[h]-b(-al) (u-)naj(-al)*, as for example suggested by Boot (2005c: 2). We have spellings that seldom appear in this couplet (e.g. **u=tz'i-ba=li u=na-ja=la**, NAR K1398, C1-G1)[646].

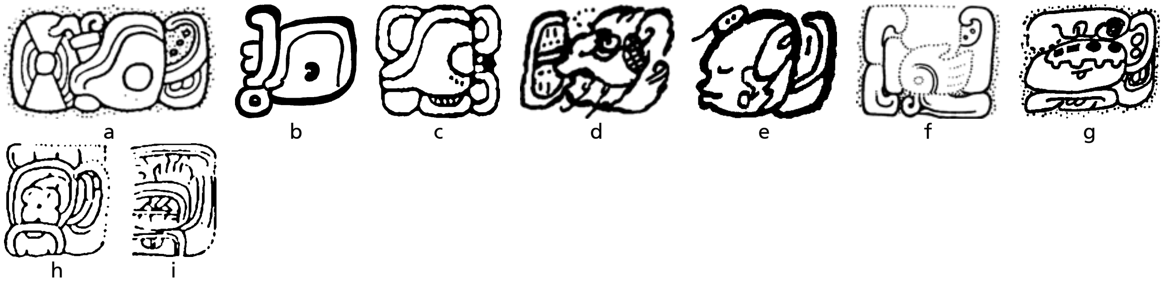

Figure 63: Examples of passivations with unclear reading or segmentation. **a)** nu-?=ja (DPL HS. 2 E IV, E2)[647], **b)** chu (COL K2352, W2)[648], **c)** chu-ku-ka=ya (MAR St. 3, B11)[649], **d)** tz'i-bi (COL K1335, B1), **e)** na=ja (COL K1080, A3), **f)** NAH K'AL=wi=ja ? (CPN Mon. 108, P1)[650], **g)** ?-TZ'AM=na=ja (CRN P. 3, E4), **h)** u=CH'EN=na=ja (CPN St. P, D4), **i)** u=PAT=na=ja (CPN St. P, C3).

285, 291-292, Lacadena and Wichmann 2004: 115-116). Another example spells **TZUTZ=ho=ma** (Figure 62t), its dating to 9.11.10.0.0 is also too early to be explained with the orthographic loss of distinguishing the spirants (Grube 2004d: 79-81).

645 Although such participles are rather pertaining to the Yukatekan branch, e.g. YUK *–an ~ –aʔan* (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 373).

646 It is too easy to consider such spellings as a 'pseudo-text' of Calvin's (2006: 26) third category (readable with limited communicative value). The vessel K1398 cited can be considered as one calligraphic masterpiece, with many grammatical forms otherwise uncommon in the hieroglyphic corpus (cf. Beliaev and Davletshin 2006). Perhaps such couplets of nominal or nominalised forms appear in the PSS as a variant in the dedication rhetorics. However, if in such instance a spelling **tz'i-bi** occurs, I would assume the passive with an underspelled =**na=ja(=la)**, as the synharmonic spelling is typical for *(u-)tz'i[h]b-n-aj(-al)*, whereas **tz'i-ba** is commonly used with a *–Vl* nominaliser to follow (see footnote 83). On the other hand, the mere appearance of **na-ja(-la)** in a dedication text can be taken as an underspelling of the verbal root (considering the formulaic nature of the PSS) and thus indicate a passive form, but is not necessarily one.

647 A provisional transitive *nuC* root is assumed for this verb (although the root can also be nominal with an inchoative derivation). In order to narrow down a decipherment proposal for the grapheme ZYA, empty spaces in the syllabic grid need to be considered with two assumptions regarding its vowel. If it is an integrative spelling, then it is a **Ca** sign which only leaves **t'a** as a candidate. See footnote 594 for another **t'a** syllabogram that has more support by substitution patterns (although there could be a second **t'a** sign). Lexical support for **nut'* comes from CHR *nut'i*, "join, splice, attach" (Wisdom 1950: 548) and CHL *ñut'ul*, "pegado" (Aulie and de Aulie 1978: 66). If it is a non-integrative spelling, the grapheme is likely harmonic, leaving **ch'u** and **wu** as alternatives, although no lexical support is found for **nuch'* or **nuw*. Another **ch'u** decipherment was proposed for the unclassified BAT.STONE sign (Bíró 2011c: 306-309). The three candidates can be tested against other occurrences for their productivity. On CPN Alt. R, L1, the collocation ZYA°ZC1.ZU1 indicates a passive verb. ZYA as **t'a** is unlikely, unless the infix is read first for ***ku-t'a=ja**, yielding no lexical evidence. As **ch'u**, the only evidence is CHR *ch'uhku*, "examine, watch, find out about" (Wisdom 1950: 724); with **wu**, there is no evidence neither way of reading. On CPN T. 11, WDSP, B2, we find ZYA.AL3 with two possible interpretations. If **a** serves to complement the proposed **t'a** sign, ***t'a-a** < **t'a'** would correspond to CHR *t'a'*, "substance, material, inner content; excess flesh, pulp, […], pith, or meat of a plant or fruit" (Wisdom 1950: 683). If ZYA contains an eroded **ku** infix,

Another group comprises an affixation pattern with **=na=ja** along a root that is otherwise attested as a positional or noun (Figures 63g-i) and with 3SG.ERG prefixed[651]. A possible explanation is a derived transitive of these roots[652] with a nominalised passive as *u*-STEM-*n-aj-Ø-Ø* (see Chapter 4.1.9).

Mediopassive derivations following a *–C-aj* pattern (Figure 64) are barely attested. The first identification of such suffix was made in connection to *–k'* (Beliaev and Davletshin 2003) whose only example appears with an underspelling of the thematic suffix (Figure 64c) as *uxul-k'-a[j]-Ø*. Lacadena (2004b: fn. 101) connected a possible *–p* mediopassive to a spelling from Copan (Figure 64b), but could not dispel doubts as to an overspelling (see footnote 82) for a regular passive. The identification of another instance with *–p* in Quirigua (Figure 64a) supports the case for Copan, both cases can be analysed as *tz'ap-p-aj-Ø* and *chok-p-a[j]-Ø*.

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then we find the same as on CPN Alt. R, with just an alternate spelling of the thematic suffix. Also, a verbal statement makes more sense than a noun in this context following an accession phrase. Another example is found on COL Lnt. Kansas, D4b with ZYA.ZU1:AMB/33K. With none of the three proposed syllabic values, lexical evidence is found. This might indicate an alternate morphographic value of ZYA. Based on the spelling from CPN Alt. R, the morphograph might represent **CUK** to denote a transitive or positional root (if on COL Lnt. Kansas, it is **=la-aj** to denote a positional marker). That the Dos Pilas example provides a preposed complement is unlikely, as **NUK** for "skin, hide" is already attested with the sign 3M9(1), if it is not only **nu**. It also does not substitute in other contexts, e.g. *sak nuk nah*, the proper name of House E of the Palenque palace (e.g. on PAL H96, A8). Looking for candidates for any *Cuk* transitive, the options offered by CHR are: *buka*, "sow (as seed), scatter" and *luki*, "hook, catch with a hook"; *puki*, "give away […], hand out, sow broadcast (as seed), dispenses"; *tuki*, "spill out (as from an olla), cause liquid to spill, throw a liquid out, waste, give away", *yuhku*, "shake a thing, rock a thing back and forth" (Wisdom 1950: 590, 517, 573, 676, 770). The latter is unlikely, as no substitution occur within names containing *yu[h]k-n-om*. While all decipherment proposals for ZYA must remain uncertain, the syllabic one for **t'a** has best support. As the phonemic value of ZYA is unknown, an attribution of this example to spelling group 1 or 2 is not possible.

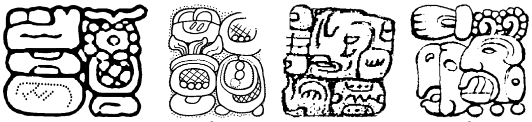
[648] See footnote 93 for the rationale to consider this defective spelling as a passive. A second example is found in C Ma. 54c2.

[649] The **ku-ka** sequence resembles the examples in Figure 54, while the **ya** sign indicates the temporal deictic enclitic *=iy*. The underspelling of **ja** to indicate a syncopated passive thematic seems most likely, so an underlying *chu<Ø>k-j-Ø=iy* can be assumed.

[650] The *nah* likely indicates a nominalised form. It is unclear what function the **wi** and **ja** signs fulfil in this expression. If **ja** indicates a passive (as assumed), **wi** might be phonemic complement to the eroded superfix, otherwise **wi** indicates an antipassive and **ja** serves as a phonemic complement or marks an absolutive status.

[651] While an **u** sign can securely be determined in the two cases from CPN St. P, the example from CRN P. 3 is less obvious. XHA is embedded in a nominal compound **u=CHUM=TZ'AM**[ma] on PAL 96G, D7 and G5, but the superfix does not resemble the sign HT8. A comparison with the morphosyntax on CPN St. P makes **u** the most likely identification.

[652] The two examples from CPN St. P have recently been discussed as passive forms (Bíró and Davletshin 2011: 5), but ignoring the ergative prefix. The positional root *pat* can sometimes be inflected and derived as a root transitive (see Figure 50l), but in this case, a derived transitive **pat-V* from *pat*, "back" can be assumed to explain the derived transitive passivation. Likewise, *ch'en* might be turned into an applicative verb **ch'en-a*, "to dig, to make a hole", an assumption further strengthened by the following Copan 'place name formula' **KIP**[pi] **CHAN=CH'EN** < *kip chan+ch'en* (Stuart and Houston 1994: 7-13). Instead of a possible passive, CHR features the inchoative *ch'enlan*, "be dug out or concave, indented or cracked" (Wisdom 1950: 718). Hull (2003: 295) also provides a CHR passive expression *[a]che'na yar e ch'en ya*, "the hole was made there", which is however related to *che'nah*, "be done or made, be treated or handled, be made (to do)" (Wisdom 1950: 699). For the case from CRN P. 3, an intermediate usative verbalisation **tz'am-i*, "enthrone" can be used to explain the apparent derived transitive passive form.



a b c d

Figure 64: Examples of mediopassive and antipassive forms with thematic marker. **a) cho-ko=pa ch'a-ji** (QRG Zoo. G, N'4)[653], **b) i tz'a-pa=pa=ja** (CPN St. B, B1), **c) u-xu-lu=k'a BAK** (TIK Bn. Mundo Perdido, A1), **d) ma-a to-sa=ma**, CPN Alt. Z, C3.

Together, these examples provides sufficient evidence for the existence of both a *–p-aj* and *–k'-aj* mediopassive in ClM. No example of a *–tz'-aj* mediopassive is yet attested in the inscriptions. One case of *–m-aj* (Figure 64d, see footnotes 71 and 325) was tentatively identified as an antipassive (see Table 6 and footnotes 134 and 136) during the sampling, but not defined among the showcases[654].

To summarise showcases 1PASS and 1MED, the epigraphic evidence is in accordance with the linguistic data. The results Lacadena (2004b) summarised for the passive voice are confirmed, and ClM exclusively follows a precursor of the ECh pattern (with the thematic being *–aj* instead of *–a*). The same is true for *–C-aj* mediopassive and antipassive derivations. Other Ch'olan patterns are not attested. Yukatekan vernaculars are recorded (discussed in Chapter 4.3.4.1), Tzeltalan and Greater Q'anjobalan patterns are not attested in the inscriptions. In addition to Lacadena, the morphophonemics of the <*h*> infix and the conditions of vowel syncope of the thematic suffix are elaborated on the basis of phonology. The canonical spellings (reflecting a sort of 'best practice' among numerous graphotactical options) of ClM detransitivation involving a thematic suffix are summarised in Table 75. They largely concur with the expected representative spelling patterns derived from the hypothesis (Table 10).

[653] Looper's (2001: fig. 4) original drawing of this heavily eroded block is not very accurate, especially concerning the last sign. While it can be taken as **ku** or **pi** by his rendition, an inspection of photographic material by Carl Callaway proves the identification as **pa** by a barely visible crosshatching filling up the space under the inner curve (which does not touch the grapheme's outline). The drawing has been corrected accordingly.

[654] See Chapter 2.1.4, where it was taken as a suffix of *–CV* shape by Lacadena (2001: 6). In the light of the linguistic evidence gathered regarding the *–aj* thematic (Chapter 3.1.1.1), it seems more appropriate to include several antipassive forms to this group. Likely, also spellings with =**xa** ~ =**xi** apply (see footnotes 89, 127 and 148 for further discussion and alternative analyses), as they may very well represent the ClM rendition *–x-a(j) ~ –x-i(j)* of the corresponding ECh vernacular forms (cf. Sattler 2004: 378). These examples may possibly already represent a true vernacular influence (also Figure 64a) with the final spirant lost and by that represent a 2.f.i spelling scheme.

Type	Transcribed Paradigm	Canonical Spelling
<PASS>-THEM	*CV$_1$<h>C-aj-Ø ~ CV$_1$<’>C-aj-Ø*	**CV$_1$-Ca=ja / CV$_1$C-Ca=ja**
CVC		**CV$_1$-CV$_1$-Ca=ja**
VER.TR.R	*CV$_1$<h>C-a[j]-Ø ~ CV$_1$<’>C-a[j]-Ø*	**CV$_1$-Ca(=a) / CV$_1$C-Ca(=a)**
	CV$_1$<h>C-[a]j-Ø ~ CV$_1$<’>C-[a]j-Ø	**CV$_1$-CV$_1$=ja / CV$_1$-CV$_2$=ja / CV$_1$C(-CV$_1$)=ja**
	CV$_1$<Ø>C-aj-Ø=[i]j=iy	**CV$_1$C(-Ca)=ja=ji=ya**
	CV$_1$<Ø>C-[a]j-Ø=[i]j=iy	**CV$_1$C=ja=ji=ya**
	CV$_1$<Ø>C-j-Ø=iy	**CV$_1$-CV$_1$=ji=ya / CV$_1$C(-CV$_1$)=ji=ya**
	CV$_1$<Ø>C-j-V$_2$C-Ø	**CV$_1$-CV$_1$=jV$_2$=CV / CV$_1$C(-CV$_1$)=jV$_2$-CV**
<PASS>-THEM	*V$_1$<Ø>C-aj-Ø*	**V$_1$-Ca=ja / V$_1$C-Ca=ja / V$_1$C=a-ja / V$_1$C=AJ**
ʔVC	*V$_1$<Ø>C-a[j]-Ø*	**V$_1$-Ca / V$_1$C-Ca / V$_1$C=a**
VER.TR.D	*V$_1$<Ø>C-[a]j-Ø*	**V$_1$-CV$_2$=ja / V$_1$C-CV$_2$=ja / V$_1$C=ja**
	V$_1$<Ø>C-j-Ø=iy	**V$_1$-CV$_1$=ji=ya / V$_1$C-CV$_1$=ji=ya / V$_1$C-ji=ya**
-PASS-THEM	*CV$_1$(h)C-C$_d$-aj-Ø*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**
non-CVC	*V$_1$CV$_1$C-C$_d$-aj-Ø*	**V$_1$-CV$_1$-CV$_1$=C$_d$a=ja / V$_1$-CV$_1$C(-CV$_1$)=C$_d$a=ja**
VER.TR.D	*(V$_1$)CV$_1$(h)C-C$_d$-a[j]-Ø*	**(V$_1$-)CV$_1$-CV$_1$=C$_d$a / (V$_1$-)CV$_1$C(-CV$_1$)=C$_d$a**
	CV$_1$(h)C-C$_d$-aj-V$_2$C-Ø	**CV$_1$-CV$_1$=C$_d$a=jV$_2$=CV / CV$_1$C(-CV$_1$)=C$_d$a=jV$_2$=VC**
-MED-THEM	*CV$_1$C-C$_d$-aj-Ø*	**CV$_1$-CV$_1$=C$_d$a=ja / CV$_1$C(-CV$_1$)=C$_d$a=ja**
CVC	*CV$_1$C-C$_d$-a[j]-Ø*	**CV$_1$-CV$_1$=C$_d$a / CV$_1$C(-CV$_1$)=C$_d$a**
VER.TR.R	*CV$_1$C-C$_d$-i(j)-Ø*	**CV$_1$-CV$_1$=C$_d$i / CV$_1$C(-CV$_1$)=C$_d$i**

Table 75: Morphological paradigms and canonical spellings of passive and mediopassive derivations (C_d = consonant of the derivational morpheme).

4.1.2 – Intransitive Positional Marker *–aj ~ –j*

The linguistic review of the intransitive positional in Chapter 3.1.1.2 indicated a possible pGT reflex of **<h>…-aj* in early pCh and the continuing existence in pTz. In order to proof the reflection of a Tzeltalan vernacular (Table 13) that is separate from early pCh forms, all samples attributed to this showcases are charted by their spatial and temporal distribution (Figure 65).

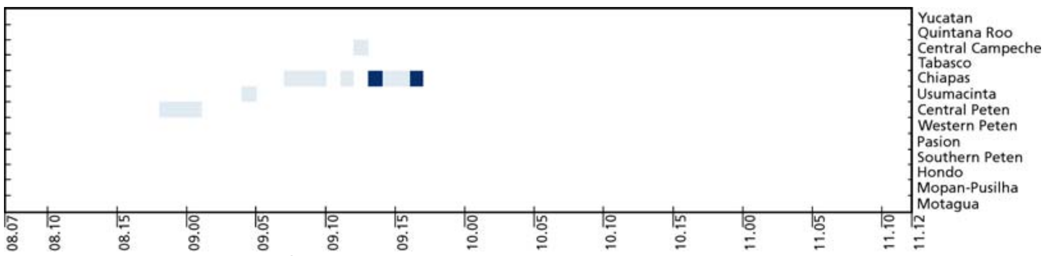


Figure 65: Heatmap of 1POS in diachronic and spatial distribution with N_S :=|15|. Sven Gronemeyer.

Two separated clusters are visible. Three examples from the Central Peten date between 8.18 and 9.0 and fit into the early pCh scheme (Figure 50a-c). In contrast, ten cases originate from the Chiapas region and clearly advocate the assumed pTz vernacular influence (Figure 68), attestable as early as 9.7. Two examples are debatable ‘outliers’ considering their dating and provenance (Figure 66d-e). Except the pTz cases, there are generally caveats regarding the pCh examples, as they also can be considered as passive spellings. The impression from the epigraphic record must also not viewed isolated, but be embedded in the general language development.

The earliest example (Figure 66a) was already illustrated by Lacadena (2004b: 169-170, fig. 7.2) as evidence for this intransitive positional derivation, and he correctly considers it to be a vestige of a

Pre-Classic language stage, as *–laj* was already in use by some 80 years (see Chapter 3.1.1.2). Nearly ten years later, another likely instance is recorded in Tikal (Figure 66b)[655]. A third example (Figure 66c) also originates from Tikal and dates another 29 years later (the three examples cover a period between 406 and 445 AD). The root *pat* is however known to sometimes appear as a transitive (see Figures 50l and 56i), so the consideration as a positional verbalisation is less secure. Confidence decreases with the next example (Figure 66d) from 514 AD and originating from the more peripheral Usumacinta region, which could also represent a passive[656]. The final example (Figure 66e) is less of concern in terms of its southern Campeche origin, but the contemporary date of 672 AD. While a few positional roots may be derived or inflected as a transitive verb, no such case is securely attested for *chum* in the corpus. This leaves little doubt for an intransitive positional – which must have been very archaic at the time of writing, chosen for reasons unknown[657].

Although the sample size is fairly low, the spelling schemes are identical to those attested with the passive with =**ja** / __# and =**jV** / … patterns. As the phonology is likewise identical with the <*h*> infix, the same morphophonemic processes as reconstructed for the passive (Chapter 4.1.1) apply with the alloforms <’> / __[±STOP,+FRICATIVE,+GLIDE] and <Ø> / __CC, at least for the supposed Early Classic form.

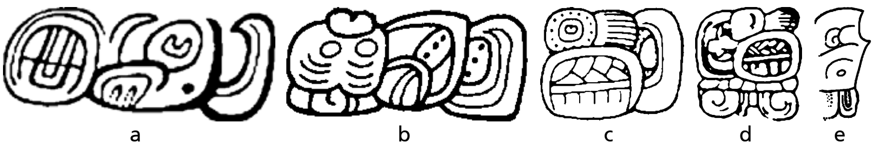


Figure 66: Examples of potential pCh intransitive positional forms with thematic marker. **a) i CHUM=ja** (TIK Hombre, C8), **b) me-ta=ja** (TIK Marcador, G9), **c) PAT=ja** (TIK St. 31, D27), **d) i PAT=ji=ya** (PNG P. 12, D1), **e) CHUM**$^{\mathbf{mu}}$**=ji** (UXL St. 6, A3a).

More of importance is the contribution of these examples regarding the historical configuration of ClM. Several authors (Houston, Robertson and Stuart 2000: 331, 333, tab. 5, fig. 4, Hruby and Child 2004: 16-17) proposed in subsequent studies the shifting of suffix functions. The epigraphic data are not fully qualified to allow conclusions to trace the developments reconstructed by historical linguistics when considering the paucity of Pre-Classic and Early Classic inscriptions, but also changing rhetorics

[655] The root *met* is considered a positional, based on CHR *metre*, “lay a thing down, lay out flat” and *metwan*, “lie down, fall prone” (Wisdom 1950: 527). As a transitive verb, it is attested as CHN *met*, “to cross s.t. (e.g. legs)” (Knowles 1984-88) and CHL *metan*, “acostarse (sobre)” (Aulie and de Aulie 1978: 57). If the root is verbal, the example would be a passive form, with the spelling scheme staying the same. Furthermore, pCh **met*, “corona // crown” (Kaufman and Norman 1984: 125) with an inchoative is another, yet not very likely alternative considering the Ch’olan evidence. The verbal expression names ‘Spearthrower Owl’ as subject and is used in the context of the *wi[l]-te’ nah*, possibly related to the Adosada platform of the Sun Pyramid in Teotihuacan (Fash, Tokovinine and Fash 2009: 213-214). An inchoative, anticausative (see Chapter 4.1.3) meaning “get into a crowned state” is possible, but a genuine verbal act seems more viable.

[656] Otherwise, the earliest potential example of *pat* in passive voice is CPN St. P, C3 (Figure 63i) in 623 AD, followed by a spelling on PAL TABL, L2 in 654 AD. Four other examples all date later from the 9.12 *K’atun* interval. The fact that the other examples of a passivised *pat* all date to the 7th century makes it probable for the two cases from Tikal and Piedras Negras to be in fact very late (almost anachronistic) positional inflections.

[657] The application of **ji** instead of **ja** is also unusual, although the Central Campeche region has a tendency to spell the thematic by =**ji** / __#. It could also be an indication for an underspelled enclitic, as the verb follows a distance number and leads over to a scattering event introduced by the *i[’]* focus marker (cf. Grube 2008: 221).

that may have favoured certain verbal forms to appear earlier in the texts. Still, they remain the only source to cross-check and possibly validate linguistic models. The discussion will continue in Chapters 4.1.12 and 4.1.16 with the $–V_1y$ suffix, but a first assessment can be made regarding *<h>…-aj* for the passive and intransitive positional (Figure 67).

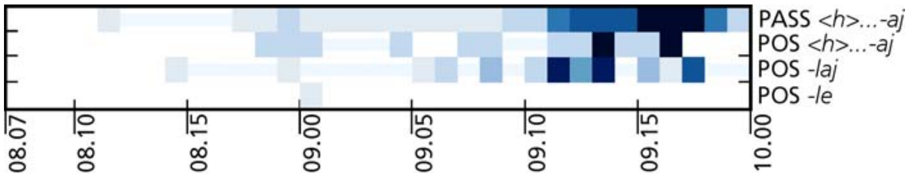


Figure 67: Heatmap of passive and several positional inflections in diachronic view (with data for *–laj* after Hruby [2002], and Hruby and Child [2004]). Sven Gronemeyer.

One proposal is the shift of the pGT **<h>…-aj* intransitive positional to the passive function in pre-pCh (Houston, Robertson and Stuart 2000: 331), simultaneously reallocating a passive $*–V_1y$ to the mediopassive function and to make way for **–laj* as the innovated pCh intransitive positional marker (see Chapter 3.1.1.2). The earliest example of a *<h>…-aj* passive possibly dates to 8.11[658], while the earliest mediopassive $–V_1y$ dates to 8.17[659], separating both by 105 years. The earliest attestation of *–l-aj* dates to 8.14, but all examples of the positionals *<h>…-aj* and *–le* postdate (see footnote 171) up around 80 to 120 years, respectively. Although Robertson (cf. Hruby and Child 2004: 20) predicted a temporal overlap in the usage of the earlier *<h>…-aj* and the later *–laj*, it does not explain the far later epigraphic *terminus post quem* for these. The epigraphic evidence is even more confusing when **–le* is indeed taken as the original pCh passive marker (see Chapter 3.1.1.2). It might have remained in the spoken language, while *<h>…-aj* was still reflected in writing and *–laj* already entered the script. Otherwise, the case of *chum-le-Ø* on the Yax Wayib Mask is an anachronism specifically used in a text dealing with events on the era day (cf. Callaway 2011: 134-138). While we have much clearer data on diglossia in later times, the Late Pre-Classic and Early Classic remain murky waters regarding to how synchronous the development of spoken pCh and its reflection in written ClM went.

The shifting process of **<h>…-aj* from pGT positional to pre-pCh passive would also request evidence for a concomitant $*–V_1y$ passive. But while the supposed intransitive positional finds apparent epigraphic reflection, no such passive form occurs. Instead, we directly find $–V_1y$ as the mediopassive at about the same time a spelling for a positional *<h>…-aj* first appears (see Chapter 4.1.12 and Figure 133), although these process are supposed to have already taken place in times before or with the emergence of writing (cf. Houston, Robertson and Stuart 2000: 331, Hruby and Child 2004: 670)[660].

[658] The passive statement is **K'AL=ja TUN**[ni] < *k'a<h>l-[a]j-Ø tun* on COL JM Plaque 4442, A11. The dating is done by the Calendar Round 3 *K'an?* 17 *Yax* in A9-A10 and what appears to be 3FC in A2, resulting in 8.11.13.11.4.

[659] The mediopassive form is **T'AB=yi** < *t'ab-[a]y-i-Ø* on TIK St. 39, Bp4a, recording the 8.17.0.0.0 period ending.

[660] This point of time remains vague and ongoing archaeological research was able to prepone the first writing into *Bak'tun* 7 (Houston 2006, Saturno, Stuart and Beltrán 2006). As language change is not the result of a sudden switch, certain forms would appear alongside for some time. But the main caveats made here are: (1) the

The finding of such forms in the epigraphic record would necessarily be a vernacular of an outdated form.

Three potential intransitive positional forms are attested in the epigraphic record, of which the innovated pCh *–*laj* and the original pCh *–*le* are of least concern, as they are securely indicated. This supports the reconstruction by Kaufman and Norman (1984: 106-107), but does not necessarily contradict the suffix shiftings (Houston, Robertson and Stuart 2000: fig. 4) if pGT had *<*h*>…-*aj* and *–*le* as its positional suffixes (see Chapter 3.1.1.2). In case the examples from Figure 66 are not a reflex of the pGT *<*h*>…-*aj*, there remains only one radical conclusion: pCh discontinued this form in favour of * –*le*, while pTz retained it. The spellings that support an Early Classic *<*h*>…-*aj* positional thus require an alternative explanation, especially when considering their rather late temporal setting. This would entail the cases of *met* and *pat* to be in fact passive forms (either of a root transitive or positional), while the examples of *chum* from TIK Hombre and UXL St. 6 could involve an underspelling (or are indeed cases of a positional used as a transitive verb). In the end, more Early Classic epigraphic evidence would be needed to shed more light on this issue.

In contrast, the epigraphic attestation of <*h*>…-*aj* as a pTz vernacular (Figure 68) is beyond doubt. It enters the script on TNA Mon. 168, one of the site's earliest monuments, dating to 577 AD (Mathews 2001a: tab. 2), and appears again on TNA Mon. 106 (Figure 68a), erected by the subsequent ruler in 593 AD[661]. Curiously, all examples of the Tzeltalan vernacular (Lacadena 2004b: fn. 90, Lacadena and Wichmann 2005a: 35) originate from Tonina and appear with the root *chum*.

The spellings are parallel to the supposed Early Classic examples with =**ja** / __# (Figures 68a-b) and =**jV** / … (Figures 68c-d), including =**ja-jV** / … overspellings (Figure 68e). In contrast to the inferences made for the ClM passive morphophonemics, the <*h*> infix is not altered in compliance with pTz , unless [h] > [Ø] / __j (Kaufman 1972: 32). The deletion of [h] in case the suffix syncopates is also unlikely, as it is a common Ch'olan feature (Kaufman and Norman 1984: 86), and does not contradict the phonological rules of pTz and TZE syllabification (cf. Kaufman 1971: 10, 23, 1972: 29-31). Hence, we can reconstruct **CHUM=ja** < *chu*<*h*>*m-aj-Ø* as *[t͡ʃuhm.ax] and **CHUM=ji=ya** < *chu*<*h*>*m-j-Ø=iy* as *[t͡ʃuhm.xij].

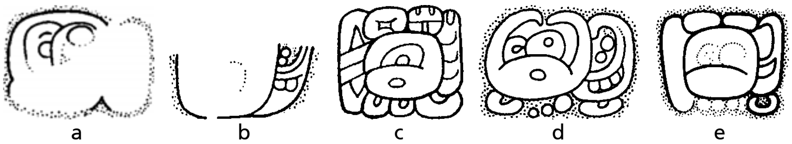


Figure 68: Examples of pTz intransitive positional forms. **a) CHUM^mu^=ja** (TNA Mon. 106, pC1), **b) CHUM=ja** (TNA Mon. 135, J1), **c) CHUM=ji=ya ta AJAW=le** (TNA Mon. 169, C4), **d) CHUM^mu^=ja=ya** (TNA Mon. 170, F1), **e) CHUM^mu^=ja-ji=ya ta AJAW** (TNA Mon. 111, O1).

epigraphic dating contradicting the linguistic reconstruction, and (2) the fact that a span of 80 to 120 years appears too long for such fundamental changes.

[661] While Tonina seems to favour the pTz positional inflection, examples of the regular ClM –*laj* appear at the same time, e.g. **CHUM=la-ja** (TNA Mon. 29, A2) or **WA'=la-ja** (TNA Mon. 30, A4).

To conclude showcase 1POS, it must be separated into two subtypes. While there are spellings that graphematically and morphologically support a pGT reflex in ClM, their time horizon is far too late to reflect spoken language. Based on the problematic correlation between historical linguistics and epigraphy, I tend to refuse its existence, demanding alternative explanations for the cases considered, such as a different derivation. The cases of =**la-ja** / __# < *–laj* and the later =**wa-ni** / __# < *–wan* that percolated from a WCh vernacular context into ClM are not considered, neither Yukatekan forms; as they are not applicable to the showcase (see Chapter 2.1.4). Other vernacular forms (see Chapter 4.1.16) have not been identified. The canonical spellings (Table 76) are in concurrence with the passive, although much more reduced in variability due to the lesser lexical range.

Type	Transcribed Paradigm	Canonical Spelling
<INTRS>-THEM CVC POS	CV_1*<h>C-aj-Ø* CV_1*<h>C-[a]j-Ø* CV_1*<Ø/h>C-j-Ø=iy*	**CV_1-Ca=ja / CV_1C-Ca=ja** **CV_1-CV_1=ja / CV_1-CV_2=ja / CV_1C(-CV_1)=ja** **CV_1-CV_1=ji=ya / CV_1C(-CV_1)=ji=ya** **CV_1-CV_1=ja-ji=ya / CV_1C(-CV_1)=ja-ji=ya**

Table 76: Morphological paradigms and canonical spellings of intransitive positionals.

4.1.3 – Inchoative Suffix *–aj ~ –Vj ~ –j*

The epigraphic evidence mainly supports the derivational pattern attested in CHR and CHL with *–aj* as the ClM paradigmatic pattern (Table 16) applicable to nouns and adjectives, as first proposed by Lacadena (2003: 848-849, 852-855), although other ~ *–Vj* alloforms seem possible. Besides this standard, several forms can potentially be identified as vernacular, at least when following the attestation in modern languages. It comprises examples of *–t-aj* for ECh and *–b-aj* ~ *–m-aj* and *–n-i* for WCh[662]. These cases provide an important contribution to trace the historical development within the Ch'olan branch and to trace isoglosses. Another point to review are the verbalisations of nominal compounds, which are also taken up in Chapters 4.1.9 and 4.1.14.

As the statistical analysis (Chapter 3.3.3.1.3) demonstrated, the inchoative showcase largely supports vowel-providing, integrative spellings (Figure 69), but still with a significant amount of non-integrative examples. Although mainly the abundance of samples based on the root *sih* is responsible, other roots are found that either follow a full syllabic pattern or are realised by a complemented morphograph. Most of the examples base on a synharmonic root whose original spelling is retained with a CaC root: **Ca-Ca / CaC^{Ca}** > **Ca-Ca=ja / CaC-Ca=ja**, or a spelling alteration with a CVC root takes place (including disharmonic spellings): **CV-CV / CVC^{CV}** > **CV-Ca=ja / CVC-Ca=ja**. All cases render a *CV(h)C-aj* form. These samples classify as spelling schemes 1.a.i and 1.b.i and consist the majority of samples. Only one sample (Figure 69c) uses a disharmonic suffix spelling with =**ji** / __#. Bisyllabic roots require alternative spellings, such as **V-CV-Ca=ja** or **CVCVC-Ca=ja / CVC-Ca=ja** spellings for any *C(h)VCC-aj* form. The consonant cluster results from the process reconstructed for pCh to

[662] The case of *–n-i* is discussed in Chapter 4.3.4.2, as it is not part of the showcase. All other potential vernacular inchoative forms are considered here, as they include the *–aj* suffix.

syncopate the second stem internal vowel to keep a derived verb bisyllabic (Kaufman and Norman 1984: 86), a rule also reconstructed for pTz (Kaufman 1972: 30)[663].

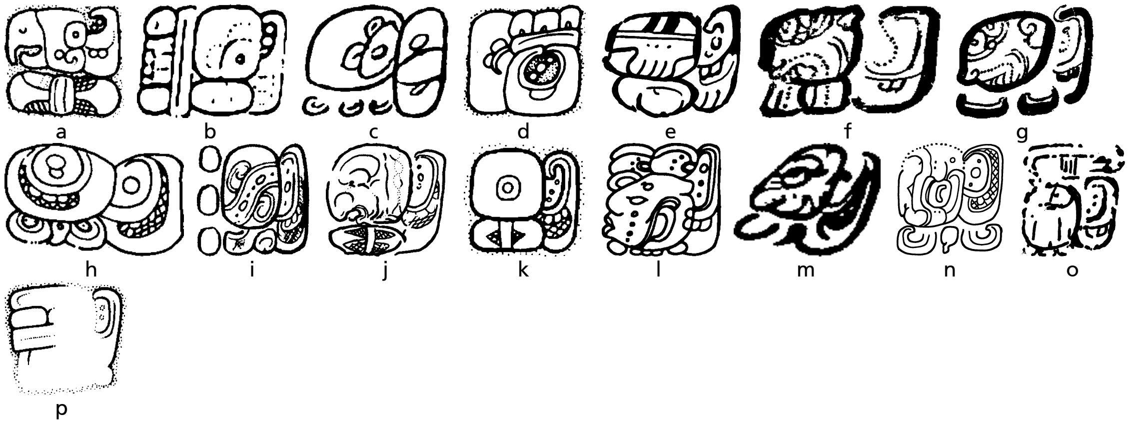


Figure 69: Examples of inchoatives with integrative spellings. a) ^{a}AK'-ta=ja (YAX Lnt. 53, B2)[664], b) ^{AJ}AK'-ta=ja (YAX St. 9, A2)[665], c) AK'-ta=ji (CPN K3296, A3), d) bu-tz'a=ja (PAL TC, R5)[666], e) CHAN-na=ja (COL K1991, B3), f) ch'o-ba=ja (C Dr. 39b)[667], g) ch'o-ya=ja (C Dr. 58, E3)[668], h) ja-ya=ja (CPN St. J, D3)[669], i) 3 PALAW-wa=ja (PAL T19B-S, F4)[670], j) pe-ta=ja (COL Shl. Taylor Limpet, G1), k) PET-ta=ja (CNC P. 1, M9), l) pi-tzi=la=ja (CRN HS. 2 IV, B1)[671], m) si-ya=ja (PAL SJPL, B1)[672], n) SIH-ya=ja (XUP Mon. 1, B1), o) tz'i-ba=ja (NTN Dwg. 23, C1), p) u-tza=ja (TNA Mon. 111, K1)[673].

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663 The same process is also observable among other examples, e.g. CHR *abich*, "urine" and the inchoative *abchih*, "urinate" (Wisdom 1950: 456). However, CHR apparently does not consequently exercise this rule, possibly because of impossible clustering (cf. Wichmann 1999: 19), e.g. compare *nichir*, "flower(s)" with *nichirih*, "come into flower" (Wisdom 1950: 541). Also see footnote 681.

664 See Grube (1992: tab. 1) for the lexical evidence and cognate sets. Although some languages have a transitive verb (e.g. CHN *ʔák'ot-in*, "to dance s.t." [Knowles 1984-88]), a passive can be excluded, as the *–C-aj* derivation is lacking. Several Greater Tzeltalan languages have *a(h)k'(o)taj* as an intransitive verb, which is assumed to be the inchoative of the corresponding noun. The reconstructed pCh form is **ahk-ot*, "baile // dance" (Kaufman and Norman 1984: 115). While ECh has /k/, WCh and pTz have /k'/, so I would rather assume a pCh **ahk'-ot*, as the ClM form also supports /k'/, with /h/ to be reconstructed. For the inchoative, no orthographic indication is found for the nucleus of the second syllable, as outlined by Lacadena (2003: 848-849, 2004b: 177-178), based on the syncopation rule. For ClM, the process of derivation and sound change is then determined **a[h]k'ot* as *[ʔah.k'ot] > *a[h]k't-aj* as *[ʔahk'.tax] (Mora-Marín 2010a: 122).

665 The reading of the sign 1G4 **AJ** in this spelling is not entirely clear. It definitely serves a phonemic complement to **AK'**, but especially in Late Classic Yaxchilan, the distinction between the allographs of **AJ** and **a** is often rather blurred (e.g. **a 20 BAK** < *a[j] k'al bak*, YAX Lnt. 1, A6). If not acrophonically used here as **a**, and assuming that /h/ ~ /j/, the writing with 1G4 may well be used to indicate the internal /h/.

666 This example is part of the name phrase of *Butz'aj Sak Chik* (PAL TC, R5-S5), the third ruler of Palenque. Boot (2009b: fn. 48) identifies *sak chik* as the name for a bird, either a lark or the Tropical Mocking bird (*Mimus gilvus*), based on YUK *sak chik*, "calandria de esta tierra, es algo blanquizca" (Barrera Vásquez 1993: 711). The *–aj* suffix cannot represent a passive thematic, as *butz'-a* is a derived transitive (Hull 2005: 14) to demand a *–C-aj* derivation. As an inchoative, the name would translate as "The Lark Became Smoking". A less likely possibility is an agentive suffix (see Chapter 4.1.5), in which the name would mean "The Smoke-One Lark". Also see Colas (2004: 113-141) for the methodological implications regarding nominal phrases containing intransitivised predicates (also see footnote 102).

667 No satisfactory translation can be given for *ch'ob*. YUK has two meanings for *ch'ob* as "agujero pequeña", "plato" and "almagre", "tierra roja utilizada para colorear a las vasijas de barre" (Barrera Vásquez 1993: 138). In view of the accompanying vignette showing Goddess O pouring water from a jar, the first meaning seems more fitting. David Stuart proposed the reading *bab-aj* (Christian Prager, written communication, June 20, 2013), but the rodent head is more similar to **ch'o** than to **ba**.

668 No satisfactory translation can be given for *ch'oy*. The only support is YUK *ch'oy*, "cubos para sacar agua de los pozos, hechos de cortezas de árboles" (Barrera Vásquez 1993: 141). The supposed inchoative follows *wa'-laj-Ø* and precedes *k'a[h]k'*, which leaves the possibility that *ch'oy-aj k'a[h]k'* is the subject that was posted and is best translated as "the fire that became bucketed". The meaning in the context of a pre-era 13 *Muluk* date (cf. Thompson 1972a: 21) connected by a ring number must remain unknown.

669 Proposed translation for *jay*: "thin". Compare to CHR *jayi*, "stretch out, spread out, slacken, widen" (Hull

Spellings where a morphograph is used as a phonographic sign to provide a full phonemic spelling (Figure 70) appear with a limited frequency among the inchoative. Especially *a[h]k'[o]t* is subject to scheme 1.e.iv, where **TAJ** (that itself sometimes gets complemented) is used to bridge the morpheme boundary by overspelling the final consonant of the nominal base. Other examples with **AJ** occasionally appear in compound expressions (see Figures 78d, g).

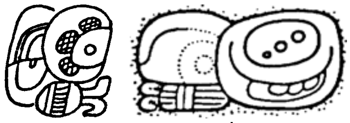
2005: 53) and CHN and CHL *jay*, "delgado" (Aulie and de Aulie 1978: 41, Keller and Luciano 1997: 128). As CHR has a root transitive lemma, a passive form might equally be possible.

[670] Stuart (2005b: 76) theorised on a meaning "thrice the blood flowed" (see footnotes 704 and 705 for additional possible inchoative expressions within the context of this example). The deciphering and reading of the WATER.BAND sign as **PALAW** ~ **POLAW** was compellingly demonstrated by Lopes (2004).

[671] I analyse this glyph block as *pitz-il-aj-Ø* to be the inchoative of *pitz-il*, "ballplayer" (cf. Houston, Robertson and Stuart 2001b: 36). This is alternative to Boot's (2009b: 149) positional *pitz-laj-Ø* (see footnote 611).

[672] For the **si** reading of the rodent head and the identification of this glyph block as the birth verb see Polyukhovich (2012). Lopes (2011) argued for a **si** reading for the similar sign APE in other contexts (see footnote 696), so the decipherment appears to be reliable. The identification of this syllabic spelling is proof for the pronunciation *siy-aj-Ø* of the birth verb which is otherwise only supported by the frequent complementation of the **SIH** morphograph with **ya** (Figure 69n), writing the nominal root *sih*, "gift" (cf. Kaufman and Norman 1984: 130). Barbara MacLeod (cf. Gronemeyer and MacLeod 2010: fn. 43) proposed that upon the inchoative derivation, the root coda is subject to a lenition process [h,x] > [j] / __VC, a phenomenon also observed in other surroundings (see footnote 695 and Figures 77c-d). This is at least the situation in Late Classic ClM, but several cases of 'underspellings' might provide evidence for the diachronic development of this sound change, also involving the morphophonemics when other suffixes follow the *–aj* inchoative. In some cases, the **ya** sign to indicate the lenition process of the root coda is absent (see Figures 75f-h) and the **jV** grapheme to indicate the inchoative suffix (frequently altered to **ji** to provide the vowel of the following morpheme) is directly attached to the root. This kind of spelling also frequently occurs, albeit the absence of any enclitics), when the birth verb is used as part of a nominal phrase. While underspellings are not uncommon in names, the cases of *Siyaj K'ahk'* and *Siyaj Chan K'awil* of Tikal and *Siyaj Chan Ahk* of Uaxactun are an interesting case. They are altogether written without a **ya** sign as either **SIH=ja** (Figure 73i) or just **SIH** (Figure 71f). For the line evidence, I will not account the examples of *Siyah Chan K'awil* with God K emerging from the split sign ZU7 conflated with the sky sign. Although it serves to spell **SIH** (Gronemeyer 2013: fn. 21) in a graphotactic parallel to the cleft sign **PA'** (Boot 2004b, Martin 2004), **ja** is always underspelled in these cases (e.g. TIK St. 31, B20). The only substitution with AL8 **SIH** comes from an unprovenanced vessel (Martin 2003: fig. 1.10) as **SIH=ja CHAN$^{\mathbf{na}}$ K'AWIL**. This is a clue that in the Early Classic (prior to *Bak'tun* 9), the lenition was uncommon, and the pronunciation of the inchoative was indeed generally *sih-aj-Ø*. With the notable exception on TIK St. 4, A7a (with **SIH-ya=ja K'AK'**, erected by *Yax Nun Ayin* to commemorate the 8.18 *K'atun* ending), the earliest occurrence of **SIH-ya=ja** < *siy-aj-Ø* to begin an almost constant spelling of this type is TIK St. 23, B4 that dates into the 9.3 *K'atun* interval. However, the earliest birth expression of this spelling comes from UAX St. 7, Cp3 to record the 8.19 period ending, but it remains temporally isolated and is considered a phonemic outlier. The absence of **ya** on monuments after 9.3 is rare and must be considered an underspelling, as such examples appear parallel to **SIH-ya=ja** in both time and space. Several border cases are ambiguous, such as **SIH=ji=ya** on TAM St. 5, Bp6 (Figure 74a). It could be an underspelling for *si[y]-[a]j-Ø=iy*, but its early date within 9.3 still allows to consider *sih-[a]j-Ø=iy*. The same is applicable to **SIH=ja=ji=ya** (RAZ Tmb. 1, A8, dating to 8.19) as either *sih-j-Ø=ij=iy* or *si[y]-[a]j-Ø=ij=iy*, or when transliterated as **SIJ-ja=ji=ya** as *sij-aj-Ø=iy*. There are some indications that in the Early Classic the word could have been *sij* (see Figure 77d with **si-ji**, dating to 9.0), while in the Late Classic it became *sih* (see Figure 80e with **si-hi**, dating to ~ 9.12). It is possible that the region around Tikal was the place where the lenition process first occurred. Regarding the transliteration of AL8, I strictly apply the value **SIH** in accordance with the pCh reconstruction and consider **ya** as a phonemic complement to transcribe *siy* (or *si[y]* in case of an underspelling).

[673] The reading of this block and its analysis as *utz-aj-Ø* is tentative, considering the degree of erosion. It follows what can be read as **K'AL=ja KUCH** < *k'a<h>l-aj-Ø kuch* (see footnote 693 regarding the reading of the sign 32B), which is a sentence by its own. The "becoming well" would also fit the context of the altar dedication.



a b

Figure 70: Examples of inchoatives with morphophonemic spellings. **a) i AK'=TAJ** (CRN P. 2, F4), **b) AK'=TAJ[ja]** (DPL HS. 2 W II, B2).

Two forms of underspellings (Figure 71) appear with the inchoative: (1) as a 1.g.i scheme only providing the suffix vowel (**CV-Ca=Ø / CV-Ca=a** / __# < *CVC-a[j]*, Figure 71a-d); and (2) as a complete underspelling among a morphographic root (**CVC=Ø** / __# < *CVC[-aj]*, Figure 71e-f), categorised as scheme 2.g.ii. Chapter 3.3.3.1.3 also raised the question whether underspellings of scheme 1.g.i may be regarded as an indicator for a sound change *–aj* / __# > *–a'* ~ *–a* / __#, as supposed for the passive. Although many modern Ch'olan languages (Table 16) follow such a vocalisation in the completive aspect, CHR lexical evidence frequently provides inchoative forms with *–aj* (see Chapter 3.1.1.3) that can be considered as a reflex of ECh and ClM[674]. WCh in contrast apparently underwent a lenition process that is not necessarily reflected among the underspellings (see the regional distribution in Figure 45b). The significance test conducted in Chapter 3.3.6.2 does not provide sufficient evidence for this assumption. As argued for the passive thematic (Chapter 4.1.1), only one example with =**a** / __# (Figure 71d) is insufficient. Examples of a non-syncopated inchoative suffix (Figure 74) provide support for *–aj* /…, but linguistic support is missing for them. Instead, the same line of argumentation applied for the passive thematic is used in order to support *–aj* / __# and *–aj* ~ *–j* /… to be the inchoative suffix alloforms.

a b c d e f

Figure 71: Examples of inchoatives with different underspellings. **a) [a]AK'-ta** (NAR Mace Head, D2), **b) PET-ta** (COL P. Maegli 3, B2a), **c) SIH-ya** (UCN St. 4, D1b), **d) SIH-ya=a** (DPL St. 8, F12), **e) ti [AJ]AK'** (MTL K1439, D1)[675], **f) SIH K'AK'** (TIK St. 31, C22).

Based on the paradigmatic =**ja** / __# suffixation among the inchoative, this showcase was initially considered to represent a fixed vowel *–aj* suffix (Chapter 2.1.1.1). Hence, **CV-CV / CVC[CV]** spellings (Figure 72) are strictly considered as non-integrative spellings of group 2. Among the examples Lacadena (2003: 852-854) brought forward in connection to the *–aj* verbaliser, some of the spellings terminate on a **Ci** syllable (Figures 72a-b, e, g). Despite the fact that these represent the original root harmony pattern, he concluded a vowel-providing alloform **Ci=ja** / __# < ***–iij*. While in relation to the passive, such root vowel harmonic spellings (Figure 55) must be non-integrative because of the

[674] This observation depends on the lexical source. While the more recent dictionary by Hull (2005) only provides examples of several *–C-a* derivations, the older materials compiled by Wisdom (1950) still indicate *–ah*. The data are insufficient to decide whether this is a recent sound shift or dialectal.

[675] This case is certainly not an indication for an underspelled noun ***a[h]k'[ot]*, "dance". Cases of prepositional phrases including **ti AK'=TAJ** (Figure 139a) demonstrate a nominalised inchoative (see Chapter 4.1.14), and let us classify this example as a 2.g.ii underspelling.

invariable *–a* thematic attested in modern Ch'olan languages (Table 6), it is worth to discuss the possibility of such vowel-providing spellings among the inchoative.

Chapter 3.1.1.3 provides linguistic evidence for ~ *–Vj* forms, complementing the one brought forward by Lacadena (2003: 857-859). Indeed, CHR exclusively uses *–aj* with colour terms. When checking the epigraphic examples in Figure 72, only *tak(in)* yields an attestation (footnote 680), which is also supportive for *–ij*. Although lexical evidence is missing for most of the hieroglyphic examples, a systematic survey of the CHR data can be used to better determine under which circumstances one of the ~ –Vj alloforms of the inchoative is used. Nevertheless, based on the statistical significance, *–aj* can be considered the ClM 'standard' allomorph based on the examples from Figures 69-71 (also compare *pet* in Figures 69j-k and 73d), hence it is not considered among the lexical review[676]. The data show that CHR prefers *–i*, and except with *CeC-e* forms, there is only little congruence between the suffix vowel and a specific CVC root. This so far is in congruence with the intransitive thematic suffixes (Table 46), except I propose they originally may have derived from an inchoative and before becoming lexicalised as intransitive verbs.

Based on the comparison with CHR, there is no way to proof that the **CV=ja** spellings in the epigraphic record are in fact spelling a ~ *–Vj* suffix, neither that it is a non-integrative *–[a]j* spelling. As with the cases of root-harmonic passive spellings, their low frequency would support the latter alternative. However, as there is linguistic evidence for alloforms, I tentatively suggest that these spellings, because of their deviant pattern, could have specifically been chosen to indicate one of the alloforms[677]. We may thus transcribe the examples in Figure 72 as *balun ip-ij-Ø*, *och-Ø+bih-ij-Ø*, *ok-ej-Ø*, *pet-ej-Ø*, *tak-ij-Ø*, *uxl-uj-Ø*, and *witz-ij-Ø*. To what extent such particular spelling might indicate a vernacular pronunciation must remain unanswered. All these examples necessarily feature a disharmonic suffix spelling[678].

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[676] A survey of CHR lexical evidence based on Wisdom (1950) yielded 106 intransitive verbs ending on /Vh/ that potentially reflect an original inchoative form, as they correspond to a nominal or adjectival root or stem. With *–eh*, there are 7 verbs, all except one of a CeC root: *ak'bareh*, *pereh*, *tzereh*, *tze'eh*, *tze'neh*, *we'eh*, *xe'eh*. A majority of 65 cases occurs with *–ih*, of which 9 are CiC root, 9 are non-CVC forms with /i/ nuclei, and 47 are other CVC roots and non-CVC stems: *ahnih*, *akirih*, *arakih*, *asarih*, *asih*, *atih*, *abchih*, *bihirih*, *buhkih*, *burchih*, *bu'urih*, *buhtzirih*, *chamarih*, *chamsanarih*, *chiirih*, *chuymaarih*, *ch'ahnarih*, *ch'i'ih*, *ha'xarih*, *ixih*, *iximih*, *ichih*, *ichirih*, *hihbih*, *hinih*, *kahih*, *karih*, *k'ahih*, *k'anirih*, *k'axih*, *k'axarih*, *k'inih*, *k'ixih*, *k'o'ih*, *k'oyih*, *luhk'ih*, *luhxih*, *maxa'anih*, *mechirih*, *nihkih*, *nichirih*, *nuhbih*, *nuk'ih*, *pitakih*, *pohowih*, *puhk'ih*, *sahpih*, *sakirih*, *sa'rih*, *sibih*, *sula'ih*, *takih*, *tarij*, *tehromih*, *tisih*, *tixinih*, *t'unih*, *tzunih*, *uk'ih*, *warih*, *wihrih*, *wi'irih*, *yoporih*, *yupayih*, *yutirih*. Wisdom also records several 'root intransitive' verbs ending in /V_1ih/, these represent the intransitives on *–V_1y*, e.g. *lok'oih*; some also end in /Vih/, e.g. *ek'maih*. Nevertheless, these verbs are related to a nominal root (*lok'* and *ek'em* in the cited cases), footnote 891 will further discuss these forms. With *–oh*, 22 cases are found, only 6 of them with a CoC root, the remainder with CVC and non-CVC roots and stems: *betoh*, *boroh*, *butz'ayoh*, *choroh*, *ch'amoh*, *hapoh*, *ha'atzoh*, *hok'oh*, *iroh*, *kanoh*, *k'ek'oh*, *k'inoh*, *k'o'oh*, *lotzoh*, *manoh*, *moroh*, *niroh*, *pahnoh*, *panoh*, *pach'oh*, *wahroh*, *xuxoh*. Among the 12 cases with *–uh*, only 4 appear with a CuC root: *bihnuh*, *chu'uh*, *huch'uh*, *kuruh*, *k'ayuh*, *lebuh*, *mak'uh*, *mesuh*, *niruh*, *pahruh*, *petz'uh*, *turuh*.

[677] The CHR evidence demonstrates that different *–Vj* forms might be possible with one root, see *k'in*, "day" > *k'inih* ~ *k'inoh*, "divine, predict" (Wisdom 1950: 504) or *nir*, "cure" > *niroh*, "act of curing" ~ *niruh*, "become cured" (Wisdom 1950: 540-541). It is possible that semantic nuances might be indicated. In a few cases, the use of a specific suffix might differentiate homophones, e.g. *k'o'*, "stink, foul odor" > *k'o'oh*, "stink" and *k'o'*, "fatigue" > *k'o'ih*, "be tired" (Wisdom 1950: 508-509, 615).

[678] I refuse Lacadena's (2003: 852) idea (based on the examples in Figures 72e and 72g) that this prompts the reconstruction of a long vowel suffix ****–iij*, based on harmony rule 1b (cf. Lacadena and Wichmann 2004: 109,

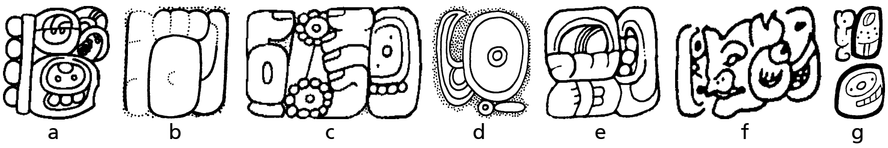

Figure 72: Examples of inchoatives with possible non-integrative spellings. **a) 9 i-pi=ja** (CPN St. A, C6a), **b) OCH=BIH-hi=ja** (PNG St. 8, F2), **c) o-ke=ja** (TNA Mon. 146, H1)[679], **d) PET-TE'=ja** (XCA Jmb. 1, Ap6), **e) ta-ki=ja** (PAL TI-M, G6)[680], **f) u-xu-lu=ja** (CRN P. 2, O7)[681], **g) wi-tzi=ja** (CML U. 26 Sp. 6, A2-A3).

Only a comparably small amount of samples is actually realised by just a morphographic root to which the syllabogram indicating the suffix is attached (Figure 73), to which also may compound examples (Figure 78) can be accounted. These cases at any rate require a reconstruction of the suffix vowel. As Lacadena (2003: 854-855) already pointed out, such spellings are ambiguous in terms of the correct pronunciation. As the examples from Figure 72 show, the range of choices may even be beyond just /a/ and /i/, but covers the entire range of vowels.

I assume these cases are less indistinct than previously thought. When the spellings group 1 examples support *–aj* as the 'standard' ClM allomorph, it is reasonable to assume that all cases with a mere morphographic spelling that do not provide the suffix vowel by a **Ca** or any **CV** sign were intended to provide *–[a]j*. This assumption is also strengthened by comparison with the suffixation patterns for the *–Vb* instrumental (Chapter 4.1.17) and the *–Vl* nominaliser (Chapter 4.1.18) as the showcases for variable vowel suffixes. As the statistical analyses for both cases (Chapters 3.3.3.5 and 3.3.3.6) indicate, a majority of spellings provides the suffix vowel or otherwise by the type of the suffixation pattern applied. In case the no supply or indication of the vowel is given by the spelling, at least the lexical class of the derivational base or its position in the syntagma determines the vowel on the linguistic level.

2005b: tab. 3). A consequent application of the harmony rules would also prompt a spelling like **o-ke=ja** < ***ok-e'j*, as per harmony rule 3 (Lacadena and Wichmann 2004: 111). This would ultimately contradict the assumption that different harmony patterns in the suffix domain form minimal pairs not only on the phonemic, but also the functional level (Lacadena and Wichmann 2005b: 36-37). Also refer to footnotes 311 for $–V_1$ transitive suffixes and 762 for different *–Vl* suffixes.

[679] The reading of the root as *ok*, "foot" is based on the parallel example **o-ke** on CPN Alt. Q, D2. The inchoative "it became footed" is also contextually supported as part of a dedication phrase concerning a pedestal by the preceding *i['] t'ab-[a]y-i-Ø y-uxul k'an tun ba[h]lam lem?* (TNA Mon. 146, D1-G1).

[680] See Lacadena (2003: 852-853, 2006: 210-211) for a discussion of the adjectival base and inchoative derivation. However, the adjective is typically bisyllabic, compare to CHR *takin*, "dry, thin, slender, skinny, bony, anemic, puny, […], withered, empty" (Wisdom 1950: 660), CHN *tiquin*, "seco" (Keller and Luciano 1997: 238), and CHL *tʌquin*, "seco" (Aulie and de Aulie 1978: 87). It is also attested in ClM with **TAK-na** < *tak[i]n* (PAL T19B-W, N1) in the name phrase of *Yax Takin* (Wald 2007: 137). CHR has evidence for the inchoative *takih*, "be dry, dry up", based on the noun *tak* "dry, dryness" (Wisdom 1950: 660). There are also corresponding verbs, the CHR intransitive *taki*, "dry up wither" (Hull 2005: 103), and the CHN transitive *tik-i(n)*, "to dry s.t." (Knowles 1984-88). Instead of a straight-forward *tak-ij-Ø*, it is possible that the example could also be an underspelling for *taki[n]-[a]j-Ø*, compare to the **TAK**$^{\mathbf{ki}}$ < *taki[n]* ~ **TAK-na** < *tak[i]n* spellings on CNC P. 1 (see footnote 15).

[681] Based on the rule for the second vowel syncope, the underlying form should be *uxl-Vj-Ø*, the use of syllabograms requires an overspelling in any case, if the syncopation indeed took place (see footnote 663). For the resulting consonant cluster, a synharmonic spelling would be expected (given by the second /u/ vowel anyway), but if the suffix would be *–aj* in this case, a spelling ****u-xu-la=ja** would seem far more logical. The given spelling is therefore more in favour of a ~ *–Vj* suffix.

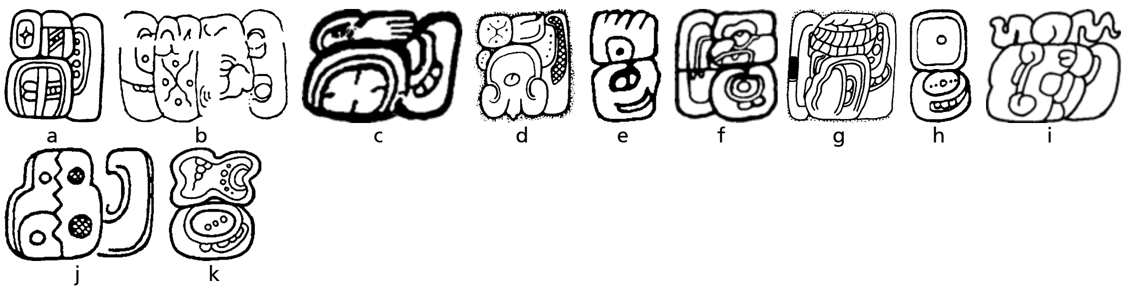

Figure 73: Examples of inchoatives with morphographic spellings. **a) AJAW=ja** (QRG Mon. 26, C7), **b) u=CHIT=ja** (CPN T. 11 WDSP, B5)[682], **c) [k'i]K'IN=ja** (COL K504, H1)[683], **d) NAB=ja CH'ICH'** (TRT Mon. 6, G6), **e) OCH=ja** (PAL PMI1, F7a)[684], **f) i OK=ja** (PAL TS, Q13), **g) NAH OTOT=ja** (PAL NGJ2, H4)[685], **h) PET=ja** (CHN ADZ-LF, B1a), **i) SIH=ja K'AK'** (TIK Marcador, D4), **j) WAY=ja** (COL Msc. Covarrubias, A1), **k) WITZ=ja** (DPL HS. 2 W III, C1a).

All examples discussed so far in Figures 69-73 testify a bisyllabic pattern of the inchoative derivation, even with non-CVC roots and stems that are subject to a vowel syncope. With a CVC root, the inchoative verb always segments into a canonical *[CV(h).Cax] or *[CV(h)C.Cax] form. A different syllabic pattern comes along with further derivations or inflections with =**jV** / … where the inchoative suffix is not syncopated (Figure 74). Only one example with **Ca**=**ja**=**ka** < *–aj-ak* (Figure 74e) to spell a subjunctive status verb is known, all other examples are exclusively with *sih* and the suffixation of *–aj=iy* for the temporal deictic enclitic.

The spelling patterns are sometimes rather complex and individual graphotactics sometimes leave doubt whether the amount of syllabograms and their position in the block are an overspelling or otherwise determine the reading order and thus the transcription (see Chapter 4.2.1.1). A comparison of root transitive passivations involving a regular *–aj* / … (Figure 61a-i) or a syncopated *–j* / … suffix (Figure 62) as well as a correlation analysis among the inchoative spellings reveals that there is indeed a pattern, where the inchoative suffix does not syncopate (Figure 74a-d). On the other hand, there are

[682] For the deciphering of AP7 as **CHIT** see Stuart, Houston and Robertson (1999, II: 56), and for the interpretation as "companion, co-…" see Gronemeyer and MacLeod (Gronemeyer and MacLeod 2010: fns. 13, 42). The example occupies the predicative position following a Calendar Round, and apparently the names of supernatural entities follow. The inchoative is even more plausible, as the enumeration ends with *ha[']-ob-Ø kok-n-om ux witik*, "they are the guardians of *Ux Witik*" (CPN T. 11 WDSP, C4-C6).

[683] The correct meaning of this inchoative form is hard to determine in the context of the PSS where it appears. In CHR, *k'inih ~ k'inoh* means "divine, predict" (Wisdom 1950: 504).

[684] This example has been categorised as 4.a.i spelling. It is problematic, as *och* is already an intransitive verb, the only solution is the morphological segmentation as *och-Ø-[a]j-Ø*, with an inchoative directly binding to a nominalised root, as a noun to form a compound is missing. Its inchoative derivation is attested by the predicate position following a Calendar Round and preceding a nominal phrase. When compared to the examples in Figure 78j-n, it is certainly a death phrase. It could be an abbreviated form (with an ellipsis or underspelling of any noun known from the composite examples, also see the hardly readable **OCH-?-?** on the same object, E2b), but with the same anticausative meaning "he became entering" implied, as with one of the composite examples.

[685] The expression is predicative, as is follows a Calendar Round. The spelling must not be confused with the absolutive suffix that occasionally is used with *nah* (see Figure 80c-d). Interesting is the inchoative with *otot* instead of *nah* (see Figure 78m for another example). While some modern Maya languages require *–otot* to be possessed (e.g. KCH [Sachse and Siis Ib'ooy 1997: 9] contrasting the subletive *jaa'*), this was not required in ClM, following the general Ch'olan pattern. If it would not be able to be possessed (e.g. *u-pib-nah-Ø* on TRT Mon. 6, M4), *nah* could also not be used with an absolutive suffix. The choice for *otot* in this and other examples is more subject to emphasise the semantics of 'someone's home' in contrast to a 'building in general' carried by *nah* (cf. Stuart 1998: 376).

cases where it does (Figure 75c-i), and the inchoative is therefore subject to the same phonemic process as noted among the passive spellings.

When comparing the examples of *sih*, it is apparent that for the examples with *–aj(=ij)=iy*, two graphotactic requirements are fulfilled: (1) the complementation of **SIH** with a **ya** sign which (2) is followed by =**ji** or a =**ja**=**ji** sequence (compare Figure 74c-d with Figure 61d-i). As discussed in footnote 672, Figure 74a is a border case, as the absence of **ya** may simply signal the Early Classic pronunciation rather than being considered as the spelling for a syncopated ***si[y]-j-Ø=iy* form. The numerical proportion of the respective spelling patterns is much different to the passive thematic (compare to footnote 636)[686]. The cases shown in Figure 74a-b therefore provide a suffixation with *sih-[a]j-Ø=iy* and *siy-aj-Ø=iy*, whereas the spellings in Figure 74c-d indicate *siy-aj-Ø=[i]j=i[y]* and *siy-aj-Ø=[i]j=iy*. In the first case, the result is a canonical trisyllabic form *[si.ja.xij], the latter a quadripartite form *[si.ja.xi.xij]. As no infixation takes place as with the passive, the syncopation of the *–aj* suffix is not required to maintain a (CV).CV.CV.CVC syllabification and *=iy* ~ *=ij=iy* can freely alternate (Wald 2004b: 243), although the latter alternant is preferred.

Figure 74: Examples of inchoatives with a non-syncopated suffix in non-final position. **a)** **SIH=ji=ya** (TAM St. 5, Bp6), **b)** **SIH-ya=ji=ya** (PNG St. 9, Cp6), **c)** **SIH-ya=ja=ji** (TIK St. 24, E16), **d)** **SIH-ya=ja=ji=ya** (ALC St. 1, B5), **e)** **tu-na=ja=ka** (CHN MON-L7, C2)[687].

However, a suffix vowel syncope is also attested with the inchoative suffix (Figure 75). Continuing with the cases of *sih*, the spelling patterns change in these cases, most notably is the absence of the **ya** syllabogram complementing **SIH** (Figure 75g-i)[688]. In the case of any given CVC root, a spelling with =**ji**=**ya** represents an underlying bisyllabic canonical *[CVC.xij] form, such as *pet-j-Ø=iy* (Figure 75e) as *[pet.xij]. A spelling with =**ja**=**ji**=**ya** (Figure 75i) would result in a **[CVC.xi.xij] form, which is not canonical. As this kind of suffix string is only attested with *sih*, there is a phonological solution to

[686] Of the 45 spellings that include a **ji** and/or a **ya** / __# sign that signal the presence of the temporal deictic enclitic, 11 spell with a **SIH-ya** sequence, of which 1 follows with =**ji**=**ya** (Figure 74b), 9 continue with =**ja**=**ji** (Figure 74c), and 1 with =**ja**=**ji**=**ya** (Figure 74d). As it is explained in footnotes 672 and 695, the **ya** sign specifically serves to indicate a lenition process before a vowel and which is not necessary in case of a vowel syncope. Even if the sound change would be maintained before a syncopated suffix, other examples (see footnotes 621, 637 and 641) have shown that the syllabogram corresponding to write the root coda becomes synharmonic, hence we would expect ****SIH**[yi] in these cases. The amount of 10 spellings with a **ja**=**ji** sequence is also good indication that it is not a mere overspelling, but both graphemes indeed serve a purpose.

[687] This case is classified as a problematic 4.a.i example, as the context is not entirely clear to support the reading and whether the main sign is in fact a conflation of **na** and **ja**, as other examples suggest (see Figure 58h), for the head variant of **ja** rather takes a different outline. The spelling can thus be analysed as *tun-aj-ak-Ø*, the subjunctive inchoative of *tun*, "stone".

[688] Of the 45 samples of *sih* involving a temporal deictic enclitic, 13 examples follow with a =**ji**=**ya** sequence (Figure 75g), 1 with =**ji**=**ya** (Figure 75h), and 19 with a =**ja**=**ji**=**ya** (Figure 75i) sequence. Other bases than *sih* are rare, but show a similar pattern (Figure 75e). Again, the number of cases with a **ja**=**ji** sequence is too high to be disposed as overspellings.

arrive at a regular *[CV.xi.xij] form, when the root coda /h/ is deleted next to the /j/ of the suffix[689]. The spelling **SIH=ja=ji=ya** is therefore analytical in terms of the underlying morphology as ***sih-j-Ø=[i]j=iy*, but phonologically, the word segments as *[si.xi.xij]. Similar is the **OCH=BIH=ji=ya** (Figure 75c) with an underlying ***och-Ø+bih-j-Ø=iy*, but pronounced as *[ʔot͡ʃ.b'i.xij]. A suffixation with **=jV=ji=ya** < ~ *=ij=iy* would likely not be possible with roots other than *CVh* or *CVj*.

Another important group with a syncopated suffix are re-adjectivised inchoatives (Figure 75a-b, d, l-m), especially those of colour terms first discussed by Houston, Robertson and Stuart (2001b: 39-42). The suffix sequence **=ja=la** together with any adjectival CVC root thus spells a canonical CVC.CVC form, such as *k'an-j-al* (Figure 75b) as *[k'an.xal]. Note that different syllabifications, as with intensified adjectives (Figure 75m), may appear (see footnote 271). Identical in their orthography and syllabification, but functionally different are the abstractive nominalisations of inchoatives (Figure 75j-k) by the ~ *–al* suffix (Houston, Robertson and Stuart 2001b: 7-8, 25-26)[690]. An example of good support is *tz'i[h]b-j-al* (Figure 75j), literally the "what became writing" in semantic substitution with *u-tz'i[h]b-al* (see footnote 83) and *u-tz'i[h]b-n-aj-al* (see Chapter 4.1.1) in PSS dedication statements.

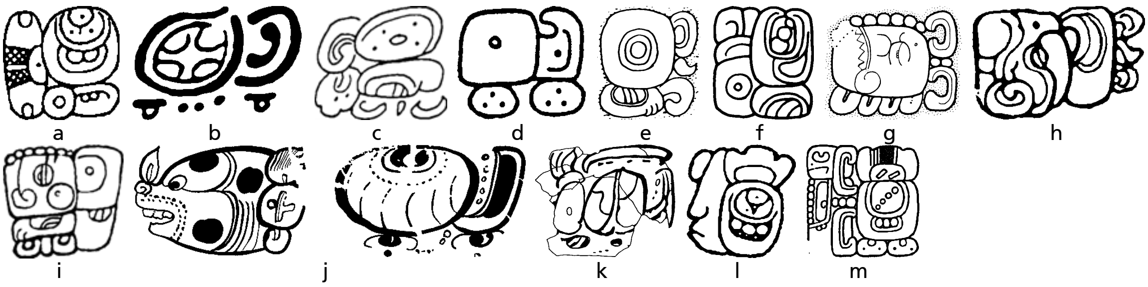

Figure 75: Examples of inchoatives with a syncopated suffix in non-final position. **a) CHAK=ja=la TE'** (YAX Lnt. 45, D5), **b) K'AN=ja=la** (COL K5509, T1)[691], **c) OCH=BIH=ji=ya** (CRN P. 2, I3), **d) PET=ja=la** (CHN T4L-L2, C3), **e) PET=ji=ya** (PAL TS, C9), **f) SAK=ja=li** (PAL HCEF, I1), **g) SIH=ji=ya** (CNC P. 2, B3), **h) SIH=ja=ya** (CPN St. 7, F8), **i) SIH=ja=ji=ya** (ZPT Alt. 1, E1), **j) tz'i-ba=ja=la** (AGT Grieta Bowl 805284, pB1-pC1), **k) ti u-tzu=ja=la** (CLK Bur. 4 Stucco Text, pD1), **l) IX YAX=ja=la** (YAX Lnt. 14, C1), **m) a ya=YAX=ja=la** (IXZ St. 4, A3).

[689] This assumption is justified by the regular process of C_1 > [Ø] / __C_1 in modern Ch'olan languages (cf. Knowles [1984: 58-61] for CHN, and Wichmann [1999: 20] for CHR).

[690] The authors analyse with a morphosyllable ****IL** in these cases, as they consider the abstractive suffix to be a variable *–Vl* suffix, with ~ *–il* as the major allomorph to express some 'X-ness'. In their view, this is contrasted by **=la** (or ****AL**) < *–al* (Houston, Robertson and Stuart 2001b: 36, fn. 12) as an agentive nominaliser, as for example in *pitz-al* and *saj-al*, and potentially in emblem glyphs (instead of a locative function [Gronemeyer 2012: 15]). The context of the cited nominalised inchoatives demonstrates that the situation is more diverse. These represent more a collective abstraction (cf. Stuart 1998: 380) instead of a qualitative feature. To what extent these two levels are graphematically distinguished by a preponderant **=li** and **=la** suffixation pattern is not subject of the showcases and requires further investigation. In any case, it shows that the analysis with a morphosyllable is generalised and not exhaustive enough to explain all cases of abstractive derivation, questioning at least the analysis by means of the ****IL** morphosyllable. In the three attested cases of a nominalised inchoative, the spelling indicates **=la** < *–al* by a preceding **=Ca** sign instead of **=li** < *–il*.

[691] Boot (2006b) discusses some contexts where he considers **ja-la** as a syllabic substitution for the signs ZS9 and 33C, proposed to read **JAL** < *jal*, "reed", when preceded by a colour term. While I agree that e.g. TRT Mon. 6, M3-N3 names the structure (cf. Gronemeyer and MacLeod 2010: fn. 6), I consider the sign sequence **=ja=la** < *–j-al* as a nominalised inchoative, rather than the proper name being "First Yellow Reed". The same applies for morphographic substitutions, such as **NAH K'AN**[na]**=JAL** < *nah k'an-j-al* (CPN T. 11 SDWP, A3). A re-adjectivised inchoative may not apply in all cases, e.g. **YAX JAL**[la] **NAH** < *yax jal nah*, "green reed house" (RAZ Bur. 6, East). The Early Classic dating would make such morphophonemic spelling unlikely, but not impossible.

A small group of 13 samples feature an inchoative following a *–C-aj* pattern. Based on their current distribution in modern Ch'olan languages (Table 16), the different alloforms are distinguished between supposed ECh *–t-aj* and WCh *–b-aj* ~ *–m-aj* vernacular forms. The temporal and geographic setting of some of these examples questions this distinction at least for earlier ClM stages with implications to the historical development, as discussed below[692].

The situation is different in ClM. The first alloform *–t-aj* (Figure 76) is attested thrice in Tikal and once in Caracol, La Corona and Tonina. Five samples (Figure 76a-b) appear with the 'palanquin event', one with the HEADLESS.BODY sign (also see footnote 694 and Figure 77f-g). Although some forms with *–t* are described among CHN and CHL as well, the grammatical evidence is more coherent in ECh, where it is also described as an innovated mediopassive suffix (see Chapter 3.1.4.1 and Table 46) that developed out of a celeritive. And despite the limited application range, all examples except the one from Tonina originate from the central and eastern lowlands from 9.13 onwards. As explained in footnotes 694 and 695, the basis for the derivation with =**ta**=**ja** is not verbal, excluding the possibility of a mediopassive derivation (to which the *–t* suffix might have shifted in later times with respect to the similar semantics from an 'anticausative' perspective), but testifying an inchoative state of change based on a nominal basis.

Although the quantity and lexical range is not representative, the epigraphic evidence supports the assumption of an eastern innovation that became reflected in ECh languages. It developed in Tikal and spread to the periphery of the Peten lowlands, reaching as far as Chiapas in an isolated case.

a b c

Figure 76: Examples of inchoatives following a supposed ECh *–C-aj* vernacular pattern. **a)** **KUCH**[chi]**=ta=ja** (CRC Alt. 12, 3)[693], **b)** **KUCH=ta=ja** (TIK T. 1 Lnt. 3, C2), **c)** **HEADLESS.BODY=ta=ja** (TNA Mon. 161, L1)[694].

[692] It must also be noted that the derivational process is different in modern languages. In ECh, *–C* is the proper derivational suffix, while *–a* is the thematic of derived intransitives. Although a concise grammatical treatment is missing for WCh languages, the data indicate that the forms are not only semi-productive, but also predominantly used with adjectivised verbs. Hereby, *–C* derives an intermediate participial form, while *–a(n)* is the proper inchoative suffix.

[693] The reading of the sign 32B as **KUCH** originates from Barbara MacLeod, the arguments are discussed by Looper (2002: 186), also explaining the frequent affixation with **ya** in case of possession. While there is a verb *kuch*, "to carry" (see Figure 51g) attested in Ch'olan (cf. Kaufman and Norman 1984: 123), a nominal root necessary to derive an inchoative is only attested in Yukatekan, e.g. YUK *kuch*, "carga que el hombre o la bestia llevan a cuestas" and "carga que trae el oficio y el mismo cargo y oficio" (Barrera Vásquez 1993: 342). The **KUCH** reading is supported by phonemic complementation with **chi** in several cases (Figure 76a). From a semantic perspective, the reading is also supported by its use in Tikal among the 'palanquin events' (cf. Martin 1996: 228-229), related to the parading of (captured) litters. Although the underlying noun is only attested in Yukatekan and Colonial YUK has a *–t-ah(-i)* inchoative (Table 17), a Ch'olan morphology is more likely considering the provenance of the examples. Note that in Tikal, *kuch* in one instance is also verbalised with an *–iy* versive (see Chapter 4.1.15 and Figure 143a).

[694] See footnote 223 for a brief explanation on the HEADLESS.BODY sign HT2, which Barbara MacLeod identified as the base for an inchoative with *–m-aj* (Figure 77g). Its derivation here with *–t-aj*, but also with *–b-aj* (Figure 77f) is proof for an inchoative derived by a set of different, but related suffixes.

The supposed WCh inchoative vernaculars with *–b-aj* ~ *–m-aj* (Figure 77) feature a more diverse distribution. Both appear with genuine nominal and adjectival roots in the epigraphic records. The ClM counterpart =**ma**=**ja** < *–m-aj* of a WCh **–m-a*, as first discussed in connection with the **HEADLESS.BODY**=**ma**=**ja** spelling indeed appears twice as early as 9.0 on celts most likely from Rio Azul (Figure 77d, see footnote 696), then again with two examples (Figure 77c, g) in Tortuguero, dating to 9.10. In all cases, the derived basis is either substantival or adjectival.

The ClM =**ba**=**ja** < *–b-aj* of a WCh **–b-a* (Figure 77a-b, e-f) is exclusively attested in the region in and around Palenque from 9.11 on. Although the sample size is small, two groups can be separated. The earlier examples that date between 9.11 and 9.12 (Figure 77e-f) derive from a nominal base, similar as the examples with *–m-aj* do. The two later examples (Figure 77a-b) date to 9.14-9.15 and are based on the transitive verbs *k'al* and *mak'*. This complies with MacLeod's (1987: fig. 15) data of WCh *–C-a* [+COM] inchoatives of transitives via an intermediate participle, and to which the ClM *–C-aj* forms (Table 20) are predecessor. The meaning of such forms is similar to the Spanish 'root+se' anticausatives, such as the transitive "tostar" versus the intransitive "tostarse", therefore similar to mediopassives (see footnote 157). But the underlying meaning of such forms, though originally verbal, is inchoative. Hence, a case like the Palenque *k'al-b-aj-Ø te'* can be translated as "the tree (was) becoming bound", from the transitive "to bind" via an intermediate participle "to be bound". The spelling of a reflexive *–ba* can be excluded for semantic reasons (as a tree will not bind itself) and by graphematics (not explaining the =**ja** suffixation).

As additional evidence from CHN (cf. Keller and Luciano 1997: 458) suggests, suffixes of the shape *–C-an* [+INC] / *–C-a* [+COM] can be used with both transitive verbs and adjectives, thus acting as hybrid intransitivisers between the mediopassive and the inchoative. This distinction is only technical by the different lexical classes used as the derivational basis, but both functions can be subsumed under the broader typological term 'anticausative'.

The epigraphic distribution pattern of the supposed WCh *–C-aj* inchoatives require some alignment of the historical development of the linguistic data. As the case of the Rio Azul celts argues against a vernacular feature, it is possible that both allomorphs (but certainly at least *–m-aj*) are a genuine ClM derivational scheme that itself may originate from a general pCh intransitiviser. Parallel to the ClM passive and mediopassive paradigm (see Chapter 4.1.1), *–C* represents the intransitivising morpheme, while *–aj* is the thematic suffix. This scheme must exhibit a specific (celeritive?) semantic emphasis expressed when the *–C* morpheme was used instead of the regular *–aj* scheme. The middle Late Classic evidence from Palenque supports the functional shift to a derivational scheme of transitive verbs (with *–C* deriving a participle) that is attested in modern WCh language descriptions, and therefore is evidence of a true WCh vernacular form in these cases (see Chapter 4.3.6).

Regarding the syllabification pattern, both the innovated ECh *–t-aj* as well as the ClM and later WCh vernacular *–m-aj* ~ *–b-aj* schemes result in a canonical bisyllabic CVC.CVC form, such as *kuch-t-aj-Ø* as *[kuʧ.tax] or *mak'-b-aj-Ø* as *[mak'.b'ax]. One interesting observation concerns the lenition process of the thematic suffix in case the inchoative is further derived into a causative (Figure 77c-d, see footnote 695) by the change from a =**Ca**=**ja** / __# to a =**Ca**=**yV** / … spelling. This form syllabifies in a non-canonical CV.CVC.CV.CVC form, for example *u-sij-m-ay-es-Ø* as *[ʔu.six.ma.jes].

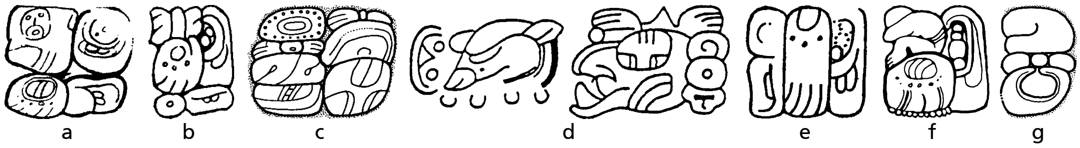

Figure 77: Examples of inchoatives following a supposed WCh *–C-aj* vernacular pattern. **a) k'a-la=ba=ja TE'** (PAL T19B-S, A'1), **b) ma-k'a=ba=ja TE'** (PAL PMI1, D4b), **c) mo-tzo=ma-ye=se** (TRT Mon. 8, A19)[695], **d) u=si-ji=ma-ye=se** (RAZ Jd. Celt 2, B4-A5)[696], **e) TE'=ba=ja** (COL Bx. Tabasco, pO1), **f) HEADLESS.BODY=ba=ja** (PAL TI-M, H9), **g) HEADLESS.BODY=ma=ja** (TRT Mon. 8, A5b).

The morphology of verbal compounds (Figure 78) has only recently been touched in previous epigraphic studies. Regarding VER+NOUN compounds with a =**ja** marking, Lacadena (2003: 855-857) was the first to discuss them in contrast to passive forms. He correctly assumed a distinct intransitive form involving a compounded patient and an agent, but without any further functional determination. Subsequently, Helmke (2012: fn. 12) considered a denominalisation process (see footnote 96), but without detailing the morphological processes any further.

The identification and morphological analysis as an intransitivised compound has to rely on graphotactics (see Chapter 4.2.1.1), as well as the syntagma. I will detail the complex of problems by Lacadena's (2003: 857) *k'al+hun-aj* example (Figure 78e), where the **HUN** sign is frequently written as a superfix to **K'AL**, and **ja** appears as a postfix. A block of such composition can either be considered as a passive form or compound inchoative, when followed by a prepositional phrase[697]. In case the headband is referred to by its generic or a proper name (cf. Stuart 2012c), the construction has to be passive; in case the coronated king is mentioned, we have to deal with an inchoative[698].

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[695] For a discussion of the meaning of the root *motz* as "root" see Gronemeyer (2011a: fn. 16). The noun is derived by the *–m-aj* / __# inchoative, and transitivised by the *–es* causative. As no ergative pronoun is written, the construction likely works with ergative extraction (see footnote 290 for another causative form), as Barbara MacLeod (written communication, October 4, 2011) proposed. Interesting is the sound shift [x] > [j] / __V that resembles the same process as with *sih* (see footnote 672). The spelling can therefore be analysed as *motz-m-ay-es-Ø* and be translated as "they caused him get rooted", likely a reference to the aforementioned supernaturals related to the lineage of Tortuguero ruler *Bahlam Ajaw*.

[696] This hieroglyph was first discussed by Lopes (2011) to propose the reading **si** for the rodent head sign APE (also see Figure 69m for another supposed allograph). The first block was first viewed as the possessed noun *u-sih*, "the gift of …" (Lopes 2011: 3), with a nominal phrase *Masey Chan Yopat* following. With the identification of the *–m-ay-es* causative inchoative (Figure 77c), the same segmentation can also be applied here as *u-sij-m-ay-es-Ø*, making this part of the nominal phrase that in total would mean something like "The Heaven-Yopat Caused Him to Become Gifted". See footnote 672 for the pronunciation of *sih ~ sij*.

[697] For example on PAL HCHS, A11 as (1) **K'AL=ja HUN tu-u=BAH** < *k'a<h>l-[a]j-Ø hun t-u-bah*, "it was bound the headband onto his head", or (2) **K'AL=HUN=ja tu-u=BAH** < *k'al-Ø-hun-[a]j-Ø t-u-bah*, "it became headband-bound onto his head". In the first case, *hun* is the syntactic agent of the passivised verb, in the second instance, we find an ellipsis of the agent.

[698] For example with **K'AL=ja=ya 9 TZAK=ja K'AK' XOK**^{ki} **HUN tu=BAH**^{hi} **K'AK' TIL-li=wi CHAN**^{na} **YOP=AT**^{ti} **ch'a-ho=ma K'UH=UN=AJAW**^{wa} < *k'a<Ø>l-j-Ø=[i]y balun tza<h>k-aj-Ø k'a[h]k' xok hun t-u-bah k'a[h]k' til-iw chan yop+at ch'ah-om k'uh un ajaw*, "after *Balun Tzahkaj K'ahk' Xok* was bound to the head of *K'ahk' Tiliw Chan Yopat*, the Scatterer, the Quirigua God-King" on QRG St. J, F4-F8. The proper name of the headband is likely a passive sentence name, and referential name phrases cannot be compounded or incorporated (Wichmann 2004a: fn. 225). Alternatively, the proper name of the headband could involve an agentive expression, see Chapter 4.1.5 for details. The full context of Figure 78e (TIK St. 31, H8-G9) is **K'AL=HUN=ja SIYAJ**

The internal morphology of these compounds has already been tangled in various places (see footnotes 96 and 357). In contrast for example to Yukatekan languages, no Ch'olan language descriptions specifically mentions a verb being able to compound with a noun. The necessary nominalisation of the verb with the proposed *–Ø* morpheme can also be explained in parallel to the well attested nominal CHL 'incorporating antipassive' (see footnotes 323 and 324 and Chapter 4.1.9). The further intransitivation by *–aj* emphasises the action versus a more descriptive stative expression, while both possibilities enable the reference to a syntactic agent[699].

Less problematic in their morphology are pure nominal compounds (Figure 78a-b), which are less accentuated in the epigraphic record. The case of *jun+ixim-aj* is insofar an interesting case, as the compound is by itself a referential nominal phrase, but morphologically a legitimate basis for a verbalisation.

The cases of inchoative compounds generally appear as group 2 spellings, and there is no reason to doubt that the suffix was generally *–aj* as well, unless there is an indication to infer a ~ *–Vj* vocalisation (see Figure 72b). The syllabification depends on the shape of the compound constituents, but regularly a non-canonical **[CVC.CV.Cax] form is considered to apply[700].

CHAN K'AWIL < *k'al-Ø+hun-aj-Ø siyaj chan k'awil*, "*Siyaj Chan K'awil* became headband-bound". A passive is impossible, as only the Tikal king can be the syntactic agent in an intransitive phrase. A clear indication of a passive form are examples, where both constituents of the phrase are graphotactically separated into two blocks, e.g. **K'AL=ja HUN**[na] **tu=BAH** < *k'a<h>l-[a]j-Ø hun t-u-bah* (BPK ScS. 5, A2-C1) or **2 K'AL=ji SAK HUN**[na] < *cha' k'a<h>l-[a]j-Ø sak hun* (PAL TI-M, I2-J2). Note that in these contexts the 'mirror' element on the FLAT.HAND sign serves as a placeholder without any phonemic value. The examples suggest that despite the compacted nature of many *k'al* expressions, the majority is a passive form. But it always needs to be an inchoative compound, when the subject is specified by an anthroponym. Another prime example is the 'house censing' expression with the intransitive verb *el* (Stuart 1998: 389-390), that only can be an inchoative compound (Figure 78c) with the name or type of the structure following, but can otherwise also be taken as a simple intransitive (see Chapter 4.2.1.1) with *nah(-aj)* as the intransitive agent (Figure 80c). The same applies for the *na[h]b-aj-Ø ch'ich'* and *witz-aj-Ø jol* expressions, when not separated into two blocks (Figure 73k), but condensed in one (Figure 73d). The latter example from TRT Mon. 6, G6 might as well allow an alternate compound reading *ch'ich'+na[h]b-[a]j-Ø*, "it became blood-pooled" instead of *na[h]b-aj-Ø ch'ich'*, "it became pooled the blood". Note that in the compounded alternative, **NAB** then needs to be read second as the visible part of a superimposed, complex grapheme.

699 Compare the full example from Figure 78f (CPN Peccary Skull, A2-B2) **K'AL=TUN**[ni]**=ja FOLIATED.AJAW** < *k'al-Ø+tun-[a]j-Ø FOLIATED.AJAW*, "*Foliated Ajaw* was stone-binding" with a nominal 'antipassive' such as **u=K'AL=TUN**[ni] **K'INICH AK=la MO' NAB** < *u-k'al-Ø+tun-Ø k'inich a[h]k-[u]l mo' na[h]b*, "it is the stone-binding of *K'inich Ahkul Mo' Nahb*" (PAL T19B-W, D1-C2). The choice for an inchoative or a nominal form seems to be dependent from the verb and therefore the preferred style. While the inchoative of *k'al-Ø+*NOUN*-aj-Ø* is only recorded with two samples (Figure 78e-f), the nominal (*u-*)(ADJ+)*k'al-Ø+*(ADJ+)NOUN*-Ø* is represented by 118 samples. On the other hand, while an inchoative *och-Ø+*NOUN*-aj-Ø* frequently occurs (although not as often as an intransitive form, see Chapter 4.1.14), no possible case of ***y-och-Ø+noun-Ø* has been found.

700 To what extent other phonological phenomena occur, must remain unanswered by the morphographic spellings. This concerns lenition process such as [h,x] > [j] / __V, or the syncope of the second stem internal vowel of a bisyllabic noun. Hence, **[ʔo͡tʃ.b'i.jax] for *och-Ø+bih-aj-Ø* or **[xun.iʃ.max] for *jun+ixim-aj-Ø* must remain tentative pronunciations.

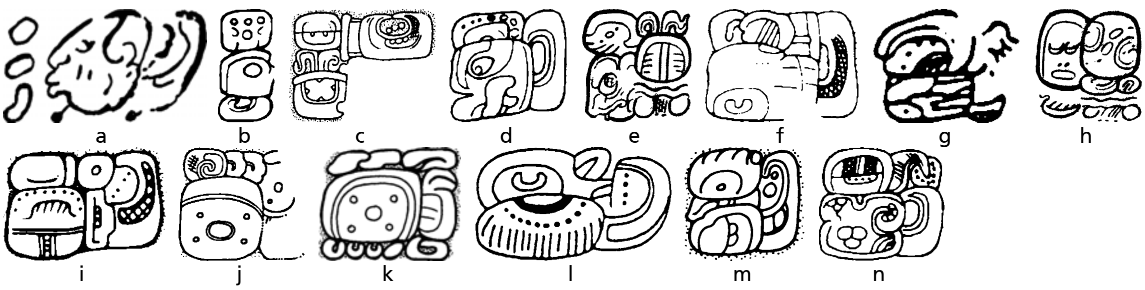

Figure 78: Examples of inchoatives in a nominal compound. **a) 1=IXIM=ja** (COL K2912, G)[701], **b) CH'ICH'=CH'EN=ja** (DPL St. 16, D4a)[702], **c) i EL=NAH=ja** (TNA Mon. 141, D3), **d) HUL=OK=ja** (TIK St. 31, C21)[703], **e) jo-ch'o=K'AK'=AJ** (PAL T19B-S, E6)[704], **f) K'AL=HUN=ja** (TIK St. 31, H8), **g) K'AL=TUN=ja** (CPN Peccary Skull, A2), **h) na-ka=PALAW**[wa]**=AJ** (PAL T19B-S, F5)[705], **i) nu-pu=TE'=ja** (TRT Mon. 6, F10)[706], **j) OCH=BIH=ja** (PMT Alt. 3, pA2)[707], **k) OCH=BIH=ji=ji=ya** (TRT Bx.

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[701] This example was pointed out by Erik Boot (personal communication, December 2009). Several ceramic vessels (e.g. K2912, K5206, K5376, K6055) feature the motif of ballplayers personifying the Maize God, occasionally identified by the headdress and the facial markings (for a Pre-Classic example, compare to the imagery on the San Bartolo North Wall [Saturno 2009: 16], for Post-Classic examples, compare to Taube [1992: fig. 17]). Sometimes, the impersonator is placed inside a quatrefoil. Note the leftmost person on K2912 that features such a Maize God imagery on his garment. The Maize God is glyphically identified as *Jun Ixim* (cf. Martin 2006: 166), and three ballplayers on K2912 are associated with the inchoative derivation of his name. While the expression *u-bah-il a[h]n*, usually associated with deity impersonators (cf. Nehammer-Knub, Thun and Helmke 2009, Stuart, Houston and Robertson 1999, II: 54), describes the actual state of being, the inchoative used here emphasises the ongoing transformation process. Also see CHR *iximih*, "yield maize or maize-like fruit" (Wisdom 1950: 486).

[702] The drawing of the respective block is not overly accurate, the given reading was proposed by Elisabeth Wagner (written communication, March 23, 2013) based on photos of the fibre glass replica erected on the main plaza of Dos Pilas. The expression is followed by **u=TOK'=PAKAL**. Wagner understands the phrase as the defeat of troops as a symbolic blood sacrifice. In this sense, the kenning *tok'-pakal* can be considered as a metaphor for 'warrior', as it was suggested by Simon Martin (cf. Boot 2002: 15, Guenter 2003a: 27), although it might very well carry a dual meaning including 'armament', as other contexts suggest (cf. Gronemeyer 2013: 24). In CHR, *ch'en* has the lexical range "opening, hole, perforation, cave, grave, ditch, vat, well, tank, canyon, arroyo, hollow, valley, cavity" (Wisdom 1950: 718). The inchoative compound can thus translate as "it became a blood-perforation" or "it became a blood-stream". Also compare to the more common *na[h]b-aj-Ø ch'ich'* expression (Figure 73d).

[703] This compound bases on the intransitive verb *hul*, "to arrive", and is associated with the date 8.17.1.4.12, the famous *entrada* date of *Siyaj K'ahk'* in Tikal (cf. Martin 2003: 12) and eight days earlier in El Peru - always recorded with *hul* on other monuments (see PRU St. 15, D1, UAX St. 5, B8, UAX St. 22, B9, TIK Marcador, B7). The compound can be translated as "he became foot-arriving" and may detail more the circumstances of the 'arrival' (i.e. by foot) than the actual event. It reminds of the *u-hil-i-Ø ok* expression (see Figure 103g).

[704] This example forms a couplet together with the preceding spelling **na-ka=PALAW**[wa]**=AJ** (Figure 78h, see below). Its context and morphology is not beyond doubt. The aforesaid narrative in blocks E3-E5 (Stuart 2005b: 68-77, fig. 39) refers to the beheading of the 'Starry Deer Crocodile'. Then, blood is made into a lake (*ux palaw-aj-Ø u-ch'ich'-el*, see Figures 69i and 86e) for three times. It is unclear whether the blood-pooling refers to the decapitated 'Starry Deer Crocodile' or to the following two blocks, which are considered as compound inchoatives here. The use of 1G4 **AJ** to spell the suffix could also contend an agentive use (see Chapter 4.1.5), as discussed by some authors (Lopes 2004: 4, Stuart 2005b: 76), particularly as we have an agentive **jo-ch'o=ma K'AK'** < *joch'-om k'a[h]k'*, "fire-driller" on TNA Mon. 149, M1. A verbal predicate seems more likely though, describing preparatory actions, as the story continues in blocks F6-H1 with *i['] pat-laj y-e[h]t-ej-0 jun ye[']-nal cha[h]k*, "then it was formed, it has been the doing of *Jun Ye'nal Chahk*.

[705] Crucial for the understanding is the meaning of *nak*. Stuart (2005b: 76) relates it to the transitive verb "to conquer", attested by the **u=na-ka=wa** spelling on DPL HS. 2 E II, C1 (Figure 99g), while Lopes (2004: 4) bases his interpretation to the YUK verb *nak*, "subir" (Barrera Vásquez 1993: 553). This makes good sense in combination with *palaw* as "it became a flood-rising" – and hereby there is further support to consider the sign 1G4 to mark the inchoative instead of an agentive in both expressions on the hieroglyphic bench. There are also examples in Palenque, where 1G4 appears in other contexts, e.g. **pi-bi-na-AJ** < *pib-nah*, "sweat-bath" (PAL TFC, F1). In this sense, the case of **OCH=HA'=AJ** < *och-Ø+ha'-aj-Ø* (MTL K1004, T3) is also an interesting example. While considered an inchoative in comparison to similar examples (Figures 78i-l), a stative agentive "he is the water-entering-person" cannot be eliminated with certainty.

[706] The morphology of this example has sparked the interest of several epigraphers (Bíró 2011b: fn. 3, Gronemeyer and MacLeod 2010: 47). With the analysis as the inchoative of a compound, I elaborate Bíró's idea and translate as "it became spear-joined", if *te'* is viewed here as a metaphor for "spear". The idea is supported by the

1, F2), l) OCH=HA'=ja (RAZ Jd. Celt 1, B9), m) OCH=OTOT=ja (PAL TFCB, G1), n) i OCH=WITZ=ja (TIK St. 31, C26).

Morphologically and phonologically, the epigraphic evidence is in accordance with the linguistic data. For the general *–aj* ~ *–Vj* inchoative derivation, ClM features a pattern best reflected in ECh (where the suffix underwent a sound change *–aj* > *–a*). It is attested as early as 8.17 in the name of *Sihaj K'ahk'* and from 8.19 on in regular predicative position. The spellings show only little evidence for the regular use of ~ *–Vj* in contrast to the standard allomorph *–aj*, and suggestive spellings appear only after 9.12. Compound forms appear as early as 9.0, but disappear after 9.18, they are discontinued in the scribal tradition of Yucatan and find no reflex in modern Ch'olan languages. Alternative Ch'olan pattern with *–C-aj* are attested within a limited range and contribute to the development of vernacular forms. Additional Ch'olan inchoative forms that are not part of the showcase are recorded as well (see Chapter 4.3.4.2). Because of the phonological similarity, Yukatekan vernacular forms cannot be distinguished with certainty from the ClM form, patterns exclusive to this branch (such as *–ch-aj* ~ *–p-aj*, see Table 17) are not yet attested. Distinctive Tzeltalan or Greater Q'anjobalan forms are likewise absent in the inscriptions. Although epigraphic evidence comes only with the spellings for *a[h]k't-aj*, we can assume the regular application of vowel syncope either with stems or the derivational suffix to arrive at canonical syllabification.

The definition of inchoative forms, as demonstrated by the individual samples, has been applied in a broad sense. It is based on the presence of the graphematic =**ja** / __# and =**jV** / … marker with

bah te' title as "warrior" (Closs 1984) or possibly "captain". The expression refers to a battle at a place called *Ahin* (Gronemeyer 2006b: 40, 56). Interestingly, Old Norse also uses similar kennings for 'battle', such as *vápna þing* ~ *vápnþing*, "assembly of weapons" or *vápna mót*, "meeting of weapons", or more specific as *fleinþing*, "shaft-assembly" or *geirþing*, "spear-assembly" (Meissner 1921: 193-194). Hereby, *þing* originally referred to a moot in Germanic societies (Kluge 1899: 78), in which young men were also initiated to adulthood by equipping them with weapons: "tum in ipsio concilio vel principium aliquis vel pater vel propinqui scuto frameaque iuvenem ornate" (Tacitus Ger.: 13, 1).

[707] The identification of *och-bih* as a death expression has long been noticed (Mathews and Schele 1974) and was first discussed on a linguistic basis by David Stuart's decipherment of ACN as **OCH** (cf. Freidel, Schele and Parker 1993: 76). Eberl (1999: 21-23) discussed other substitutions with *ha'* and *witz* and considered *och-bih* to refer to the "Todesweg in die Unterwelt" ('path of death into the underworld'), also compare to the CHR inchoative *bihirih*, "go by trail, take the trail or road" (Wisdom 1950: 585). Based on this idea, it is tempting to consider that all *och*-NOUN expressions are *pars pro toto* snapshots of the entire process of death and mortuary treatment. Fitzsimmons (2002: 47) highlights the transformational aspect in this expression, also noting that the **OCH=BIH-hi=ja** event on PNG St. 8, F2 (Figure 72b) occurs several days after the actual death of Ruler 2 (2002: 49). Although it does not immediately support a reference to the actual exitus, as a *pars pro toto* expression it could well be used for the final entombment. If *och-bih* refers to the moment of death, *och-ha'* could be associated with the entering of the watery underworld to which the path leads. This might have allusions to the journey of the Maize God (Carl Callaway, personal communication, July 8, 2013) and the resurrection iconography (also compare to the iconography of the 'Transfiguration Tripod' COL Berlin IV Ca 49845 [Grube and Gaida 2006: #12]). As a final step, *och-witz* describes the arrival in the burial chamber of the funerary temple, which nevertheless is an otherworldly place, as e.g. visible in the iconography of RAZ Tmb. 1 (Hellmuth 1987: fig. 594). A good case is the example of *och[-i]-Ø (ta) witz* (Figure 141g), taking place 260 days after the 9.3.0.0.0 period ending. This may be due to an untimely death before the funerary monument was finished, but note the lapse of exactly one *Tzolk'in* round and its symbolic load regarding rebirth. Regarding *och-witz*, also see Hull (2003: 513-514) for a folkloristic explanatory approach. The case of *och-otot* (Figure 78m) is instead connected to the dedication of the Temple of the Foliated Cross and may refer to the entering of the effigies of the patron gods of *K'inich Kan Bahlam*, as implied later in the text.

nominal roots and stems in a predicative position. Semantically, it reaches beyond a simple 'change of state' definition applied in grammatical studies (Chapter 3.1.1.3), as supported by the CHR linguistic evidence (see footnote 676). The principal sense is the narrow 'to become X' with constituents or qualities of the natural world, as recognisable with *pet-aj* or *chan-aj*. But the application of the inchoative in ClM emphasises more a broader typological 'anticausative' perspective (cf. Haspelmath 1987: 9), although not derived from a transitive transition expression (also see Chapter 4.1.15). It focuses on the starting point of ongoing transitional process that has a definitive end point, hence it is telic. Even more, the inscriptions attest a fair use of inchoatives with objects from the material and actions of the immaterial culture, such as *tz'i[h]b-aj* or *a[h]k't-aj*.

It may be an assumption going too far when especially considering ritual activities, but at least some of the inchoatives, especially those of a compound with a nominalised verb, are kennings for a *rite de passage* (van Gennep 1909). Such forms, such as *k'al-Ø+hun-aj* for accession (cf. Eberl and Graña-Behrens 2004: 104-105, Le Fort 2000) or *och-Ø+bih-aj* for death (cf. Eberl 1999: 21-22, fig. 2.5) are thus less descriptive, but emphasise a point in the transitional process in one of the three phases. Such examples are very specific, and gradual generalisation is possible, such as with *ajaw-aj*. The use of inchoatives forms in expressions like *a[h]k't-aj*, *ch'ob-aj*, *na[h]b-aj*, *pitz-aj*, *siy-aj*, and *way-aj* therefore may also provide an important insight into the emic perception of what might be a 'ritual(istic)' action[708] someone or something undergoes to change into whatever state (physical or social).

The canonical spellings (Table 77) for the inchoative reflect those for other test group 1 cases, although it must again be stressed that *–aj* is the derivational suffix with the regular inchoative, but a thematic with *–C-aj* forms. If ~ *–Vj* allomorphs are considered, they are at best indicated by alternative spellings that are part of spelling group 1.

[708] This relates to David Stuart's assumption (cf. Houston 2000: 169) that historic and dynastic accounts as well as socio-political interactions are embedded into religious concepts and associated ritual activities, such as period endings or dedication ceremonies. Stuart therefore challenged the view of the mere historiographic purpose of monumental texts (in the Western sense), drawing attention to their religious nature (see Chapter 3.3.2). A deeper discussion of this aspect based on linguistics is beyond the scope of this study.

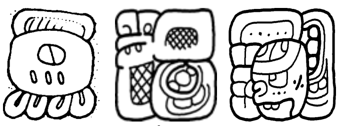
Type	Transcribed Paradigm	Canonical Spelling
-INCH CVC ADJ, NOUN	*CV_1(h)C-aj-Ø* *CV_1(h)C-a[j]-Ø* *CV_1(h)C-[a]j-Ø* *CV_1(h)C-V_sj-Ø* *CV_1(h)C-aj-Ø(=[i]j)=iy* *CV_1(h)C-j-Ø=iy* *CV_1(h)C-j-V_2C*	**CV_1-Ca=ja / CV_1C-Ca=ja** **CV_1-Ca / CV_1C-Ca** **CV_1-CV_1=ja / CV_1-CV_2=ja / CV_1C(-CV_1)=ja** **CV_1-CV_s=ja / CV_1C-CV_s=ja** **CV_1-Ca(=ja)=ji=ya / CV_1C-Ca=ji=ya** **CV_1-CV_1=ji=ya / CV_1C(-CV_1)=ji=ya** **CV_1-CV_1=jV_2=CV / CV_1C(-CV_1)=jV_2=CV**
-INCH CVCVC NOUN	*CV_1(h)CC-aj-Ø* *CV_1(h)CC-a[j]-Ø* *CV_1(h)CC-[a]j-Ø*	**$CV_1$$CV_2$C-Ca=ja / CV_1C=CAJ** **$CV_1$$CV_2$C-Ca / CV_1C-Ca** **CV_1-CV_2-CV_2=ja / $CV_1$$CV_2$C=ja**
-INCH-THEM CVC ADJ, NOUN	*CV_1(h)C-C_d-aj-Ø* *CV_1(h)C-C_d-ay-V_2C-Ø*	**CV_1-CV_1=C_da=ja / CV_1C=C_da=ja** **CV_1-CV_1=C_da=yV_2=CV / CV_1C=C_da=yV_2=CV**

Table 77: Morphological paradigms and canonical spellings of inchoative verbs (V_s = suffix vowel alternant, C_d = consonant of the derivational morpheme).

4.1.4 – Absolutive Noun Marker *–aj*

Attestations of the absolutive noun status are only very sparse in the epigraphic record, as the general rhetorics prefer factual third person statements (Hull, Carrasco and Wald 2009: 36) with an ergative inflection. The statistical analysis revealed that integrative spellings do not provide the majority of cases, and patterns to testify a certain vocalisation of the absolutive noun marker need to be found. Zender (2004b: 197-198) already testified the relation to the fixed-vowel suffix *–aj* cognates from EM languages, also visible in the pQa **–ej* form.

All supposed integrative spellings (Figure 79) retain their original harmony pattern with a root final **Ca** syllable, when compared to possessed examples (cf. **u=tu-pa** < *u-tup*, PAL TI-M, K7 and **yu=ha** < *y-uh*, COL Shl. Trumpet, A1 [Grube and Martin 2001: 35]). Such **CV-Ca=ja / V-Ca=ja** spellings of scheme 1.c.i for a *(C)VC-aj* form are a clear minority among the attested cases (see Chapter 3.3.3.1.4).



a b c

Figure 79: Examples of absolutive nouns with integrative spellings. **a) ka-ba=ji** (CRC St. 17, B2)[709], **b) tu-pa=ja** (PAL TI-M, A9), **c) u-ha=ja** (PAL TI-M, B8).

[709] The identification of this form as an absolutive is based on its syntactic position, occupying the patient position following the transitive predicate *u-pat-a* and preceding a place name formula. Two features are notable in comparison to the other samples (with the possible exception of *nah*, see footnote 712): (1) *kab*, "earth, land" is not described as a word to take the absolutive in any grammar, and (2) it is the only example that does not feature a suffixation pattern with **=ja**. One tentative explanation is the view of an abstract concept of 'territory', instead of being the domain someone is ruling over.

The few examples supposed to represent integrative spellings are all fully syllabic, in contrast the majority of non-integrative spellings are morphographic with a phonemic complement (Figure 80). The reason to believe these are non-integrative spellings rather than indications for an ~ **–*ij* absolutive is the fact that the respective lexemes regularly appear with a root-final **Ci** syllabogram when possessed[710].

It is hence possible that, besides the constant =**ja** suffixation pattern, another orthographic preference of absolutive forms is the retention of the original harmony pattern, especially with phonemically complemented spellings. But as **BAH**^{hi}=**ja** examples are prevalent, it is hard to generalise this to a rule $\mathbf{CV_1\text{-}CV_1{=}ja\ /\ CV_1C^{CV_1}{=}ja}$ or $\mathbf{CV_1\text{-}CV_2{=}ja\ /\ CV_1C^{CV_2}{=}ja}$ for a *CV$_1$C-[a]j*. All samples of this category classify as schemes 2.a.i or 2.c.i.

Figure 80: Examples of absolutive nouns with non-integrative spellings. **a) BAH^{hi}=ja** (TAM HS. 3 III, E1), **b) BAH^{hi}=ja=la** (CRC St. 3, D12b)[711], **c) NAH^{hi}=ja** (TRT Mon. 6, J6)[712], **d) na=ja** (CPN T. 11 SDWP, A2-B2)[713], **e) si-hi=ja** (TAM HS. 3 V, E1), **f) AJ SIH^{ji}=ja** (COL K2206, L1).

Spellings of a simple morphographic root (Figure 81) are relatively rare compared to those with a phonemic complement, all involving **BAH**. These all require likewise the reconstruction of the suffix vowel with *CVC-[a]j* < **CVC**=**ja**, as per scheme 2.e.i.

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[710] Compare for example to *u-bah* spellings with **u**=**BAH**^{hi} on YAX Lnt. 33, C1 ~ **u**=**BAH**^{ji} on YAX Lnt. 26, S1 ~ **u**=**ba-hi** on YAX Lnt. 2, F1, and *u-sih* spellings with **u**=**si-ji** on MQL St. 11, A6a, PUS St. E, Cp8.

[711] This example shows further unexpected suffixation, as the absolutive is described as marking a juncture in all grammars. The expression follows the arrival of a supernatural (cf. Grube and Martin 2004: 31), witnessed by Lady *Batz' Ek'* (CRC St. 3, C11b-D12a). The new clause features the illustrated block as the predicative statement, followed by an obliterated glyph in C13a and the nominal phrase of *K'an* II in C13b-D13a. The =**ja**=**la** suffixation can also be considered typical of an adjectivised (Figure 75a-b, d) or abstractive (Figure 75j-k) inchoative. But is contextually more plausible that *K'an* II is the abstractive image of the aforementioned supernaturals.

[712] The example follows **EL**=**le** in block I6. While parallel examples that also may appear split in two blocks (Figure 78c) are considered as an inchoative compound (see footnote 698), I amend such analysis of this expression presented by Gronemeyer and MacLeod (2010: fn. 26). As no proper name of the structure is included, *nah-[a]j* (see footnote 226 for a justification of the absolutive) can act as the subject to the intransitive *el-e-Ø* (hereby, =**le** functions not as a phonemic complement, but to indicate the WCh *–e* intransitive marker, see Table 46). The majority of the inchoative compounds examples in Figure 78 have the subject expressed, as these are deliberate single argument constructions to also include an object. Also see Chapter 4.2.1.1 for a broader graphematic discussion.

[713] This sample is classified as a 4.a.iv case, as the spelling cannot entirely be secured as an absolutive. It is part of the proper name (blocks A1-B4) of Temple 11 (Schele, Stuart and Grube 1989: 9), following an *i['] och[-i]-Ø k'a[h]k'* statement (blocks A1-B1). The question is whether **ja** serves within as a late synharmonic syllabic spelling **na-ja** < *nah* (as proposed by Schele, Stuart and Grube [1989: 9], also with /h/ ~ /j/), or is indeed used to indicate the absolutive status within an underspelling **na**=**ja** < *na[h]-[a]j*, as favoured here in comparison to the Tortuguero example (Figure 80c).

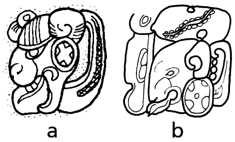

Figure 81: Examples of absolutive nouns with morphographic spellings. **a) BAH=ja** (TIK St. 39, Ap3a), **b) TE'=TOK'=BAH=ja** (CRN HS. 2 XI, A1).

Absolutive forms may appear in all positions of the syntagma a noun may occupy: (1) as a stative predicate (Figures 80a-b, e, 81a); (2) a patient (Figure 79a); and (3) as a subject (Figures 79b-c, 80c-d, 81b), also specifically as part of a nominal phrase (Figures 80a, f). The necessity for an absolutive is therefore not conditioned by the syntactic role, but solely whether the respective noun is possessed or not.

The epigraphic evidence regularly demonstrates a *CVC-aj* pattern that syllabifies in a bisyllabic *[CV.Cax] form. No *CVC(V)C-aj* forms are attested, but may be assumed, either resulting in a *[CVC.Cax] or *[CV.CV.Cax], depending on the second root vowel syncope (see footnote 663). Therefore, no morphophonemic alteration of the absolutive suffix is generally to be expected. However, there are three exceptions: (1) *bah-[a]j-al* (Figure 80b) as a possible abstraction, where the absolutive is not morpheme-final; (2) *aj sih-[a]j* (Figure 80f), where an absolutive receives an agentive prefix as a title within a nominal phrase; and (3) *te'-tok'-bah-[a]j*, where the proper unpossessed noun becomes part of a compound.

Not only do these examples add complexity to the morphology of absolutive marking, others diversify the range of noun classes (see Chapter 3.1.1.4) usually assigned with absolutive marking. There are some 'unexpected' attestations, as these nouns are not readily attributed to one of the semantic domains described in the grammars, such as *kab* (Figure 79a) and *nah* (Figure 80c-d). On the other hand, while some nouns of personal property/clothing (Figure 79b-c) appear with the absolutive suffix, others do not[714]. Despite Zender's (2004b) initial investigations, these examples make absolutive marking still poorly understood for ClM, as also a comparison with the *–Ø* / *–el* paradigm (see Chapter 4.1.6) shows. Not only did ClM retain a morpheme now extinct in Ch'olan, the semantic domains to which *–aj* is applicable have already shifted during the Classic (cf. Boot 2009b: fn. 260) and also do not seem to be entirely congruent with the modern Ch'olan languages. This may be a result of the possible functional alteration of the *–Vl* abstraction suffix, as proposed in Chapter 3.1.1.4. A more thorough comparison with the semantic categories to which EM languages bind the absolutive might therefore be more supportive for the ClM case.

While the discussion operates with *–aj* as the sole absolutive suffix in ClM, the orthographic patterns are not decisive. No minimal pairs of changing harmony patterns upon suffixation actually support the vocalisation, and the graphematic line of evidence has to be based on inference and compari-

[714] For example, compare **ko-o-ha-wa** < *ko'ohaw*, "helmet" (as a patient on PNG P. 2, X4-W5) with the possessed **u=ko-o-ha-wa** < *u-ko'ohaw-Ø* (as a stative predicate on CRN HS. 2 XIV, C2). Also see the unpossessed **pi-xo-ma** < *pixom*, "hat" (as a stative predicate on PAL TI-M, I6), for which no possessed example is known, but compare to the CHL example in footnote 231.

son. The disharmonic syllabic renderings for *uh*, "bead, jewel" (Figure 79c) can still be seen in favour of a vowel-providing spelling, as the graphemic lexicon features a morphograph (cf. **yu=UH=li** < *y-uh-[i]l*, COL Shl. BM 1952.AM 11-2, A1 [Mayer 1997: fig. 24]). As the other showcases from test group 1 veritably also indicate an *–aj* suffix by the use of the sign ZU1, it is a viable deduction to take the **=ja** spelling as support for the pronunciation for the absolutive suffix. Historical and comparative linguistics further support the idea.

No examples of an **–al* ~ **–il* absolutive suffix were found in the inscriptions that may point to a Ch'olan vernacular influence[715]. Only the pM **–aj* reflex is attested in ClM, although it is sparsely distributed. The absence of the typical Ch'olan absolutive in the epigraphic record allows diametrically opposed implications with impact on the historical configuration of pCh. With the few instances of absolutive forms, an existing vernacular Ch'olan suffix (which then may date back to pCh) was possibly (or deliberately) not recorded. Alternatively, an innovated or functionally shifted *–Vl* suffix post-dates ClM (where the latest occurrences of *–aj* date to 9.17 (Figure 80d) and 10.1 (Figure 79a), thus providing a *terminus post quem* of about 850 AD. No attestation of the ECh *–bil* suffix with kinship terms was found either, nor evidence for other vernacular absolutive patterns from other language branches.

Type	Transcribed Paradigm	Canonical Spelling
-ABSL CVC NOUN	*CVC-aj* *CVC-[a]j* *CV[C]-[a]j*	**CV_1-Ca=ja** **CV_1-CV_1=ja / CV_1C(-CV_1)=ja** **CV_1=ja**
-ABSL-ABSTR CVC NOUN	*CVC-aj-al*	**CV_1C(-CV_1)=ja=la**

Table 78: Morphological paradigms and canonical spellings of absolutive nouns.

4.1.5 – Agentive Suffix *–aj*

The *–Vj* ~ *–aj* nominaliser discussed by several scholars (Lacadena 2004b: 178, MacLeod 2004: 317-322, Robertson, Houston and Stuart 2004: 284-287, Tokovinine 2007: 18-19) is not part of the showcase definition (see Chapter 2.1.1.1). Nevertheless, the sampling process for the showcases revealed some patterns worth of discussion, although no linguistic review of the phonemics and function of this suffix is part of Chapter 3. As some of the researchers consider examples that this study includes among the showcases of test group 1, it is still appropriate to take up some arguments presented. The evidence not only rectifies the attribution of samples to a showcase, but also aides further research beyond the scope of this study on the cases illustrated here.

Tokovinine (2007: 19) concludes with reference to CHR, CHN and CHL linguistic evidence cited by Lacadena (2004b: fn. 104) that several transitive roots suffixed by *–aj* may in fact be nominali-

[715] Zender (2004b: 207, fig. 8.5a) offers a potential late example in the name if *Ix K'abal Xok* of Yaxchilan, whereas this study interprets the case (Figure 90i) as the *–V_1l* attributive suffix. An absolutive of *k'ab*, "hand" does not make sense in the syntagma of the nominal phrase.

sations, especially when occurring in nominal phrases. Such instances are taken here as passive forms, such as with *chek* (Figure 52a), *k'ux* (Figure 51i), *pas*, (Figure 50k), and *tek'* (Figure 51r). Tokovinine (2007: 19) commits himself to the statement that such forms "[do] not have to stand for a verb in this context. There is no proof that it does." There is likewise no proof that the cited instances are nominalisations. The fact of sentence names with verbal predicates is not considered, especially those with a passive form (cf. Colas 2004: 113-141)[716], as I understand e.g. the names of *Yax Pahsaj Chan Yopat* of Copan or *Chehkaj K'inich* of Caracol. Furthermore, all cases Lacadena (2004b: fn. 104) brings forward are nominalisations of causative verbs, to which the *–a(j)* nominaliser may be restricted, pending further confirmation of the suffix's conditions[717]. The consideration of the nominaliser also neglects graphematic aspects, on which the focus is put here.

As it is not part of the showcase investigation, it still remains opaque whether the *–ya(j)* nominaliser of transitive verbs (see footnote 441 and Table 56 for evidence) is ~ *–a(j)*, or restricted to certain types of transitive verbs. As the data from Chapters 3.1.5 and 3.1.6 indicate, Ch'olan usually requires prior intransitivation of transitive verbs for nominalisations, hence this nominaliser is possibly analysable as **–y-aj* with an intermediate syncopated *–y* detransitiviser (see footnotes 326, 392, 404, and 437). The *–yaj* suffix is usually spelled with =**ya-ja**, sometimes with =**ya** (Figure 82)[718]. Cases of a potential =**ji** ~ =**hi** < *–i(j)* nominaliser are discussed in Chapter 4.1.9, which may yet be different to the propositions brought forward to *–a(j)*, as it is not realised by a =**ja** suffixation pattern.

[716] It must be noted that Colas subsumed different functions of *–(C)-aj* suffixation in his chapter on passive and affective names, on the background of then current state of research. Affective verb derivation by *–l-aj* was still under discussion (Colas 2004: 128-130), before Zender (2010: 8-13) presented the line evidence. Other cases of *–aj* with the root *sih* (Colas 2004: 120-122) are considered by other authors as a passive (e.g. Wald 2000: 130), later proposed by MacLeod (cf. Gronemeyer and MacLeod 2010: fn. 43) to be an inchoative (see Chapter 4.1.3). Suffixation by *–yaj* (Colas 2004: 118-120) is also not intransitive, but a nominalisation (cf. MacLeod 2004: 322-324, Robertson, Houston and Stuart 2004: 285-286), as touched in this chapter.

[717] This condition is specifically emphasised with *–a(j)* ~ *–ya(j)* in CHR (Oakley 1966: 245), in CHR and CHN (Knowles 1984: 187-188, MacLeod 1987: figs. 14, 18), while MacLeod (1987: figs. 9, 14, 18) broadens the applicability to derived transitives in general for CHT, CHR, and CHL. Therefore, there is a strong linguistic rectification for not to consider ClM nominalisations with **–(y)aj* among roots like *chek* or *pas*, as previous authors have done.

[718] These spelling alterations can be explained in two ways: (1) =**ya** < *–ya[j]*, representing an underspelling of the final spirant; and (2) =**ya** < *–ay(a)*, as a possible allomorph, as attested in WCh (see Table 56). Considering that =**ya** spellings also occur in the central and eastern lowlands, the first option is more viable.

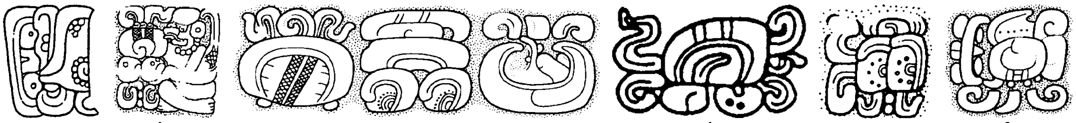

Figure 82: Possible examples of nominalisations with the *–yaj* suffix. **a) u=chu-ku=ya** (PNG Trn. 1, A'1)[719], **b) K'AK' yi=pi=ya-ja** (CPN Str. 10L-16 1st, h5)[720], **c) K'AK' yi=pi=ja=ja** (YAX Lnt. 47, A6-A7), **d) K'AK' yi=pi=ya** (LMN St. 9, C2), **d) K'AK' yi=pi=ya** (NAR St. 20, B1), **f) u=WE'=ji-ya** (YAX Lnt. 35, D7)[721].

More concrete evidence for a nominal *–aj* suffix arouses with the suffixation by =**AJ**, supposed to act as an agentive in certain surroundings (Figure 83). The use of the sign 1G4 **AJ** and its rarer **FLAMING.AK'BAL** allograph (Zender 2005a) in preposed position as a habituative agentive or demonymic marker is long acknowledged (Bricker 1986: 87, Jackson and Stuart 2001: 218-219, 222, Justeson 1984: 316, Kelley 1976: 293, 296, Knorozov 1955: 31, Lacadena 2000a: 121, Stuart and Houston 1994: 7-18). Infrequently, there are cases of underspellings with =**a** (Figure 83h), a substitution pattern also recognised with the prefix (cf. Wichmann 2002b: 100-101)[722].

The *aj* prefix seemingly is restricted to nouns or nominal compounds[723]. The suffix first appears with several expressions in Boot (2009b: 12, 25, 85, 102, 118)[724], translated as the 'X-one' or 'X-person'. In comparison to samples of inchoative derivation (Figure 78e, h) and perfect marking (Figure 168h) with =**AJ**, some cases not only appear with nouns, but positional roots. Moreover, these not only appear in a predicative position, but also among nominal phrases. But more importantly with respect to the objectives of this study, is the distinct orthographic pattern of this *–aj* suffix in contrast to those that are included in the showcase, and possibly other *–aj* nominalisers. The intersection with the suffixation patterns in test group 1, also with =**a** (e.g. Figures 60h, 71d) or =**ji** (Figure 59), is small. The supposed agentive does not even appear with =**ja** in the cases recognised.

719 This and another example (Figure 167a) are classified as 4TEMP samples, transcribing as *u-chuk[-j]-Ø=[i]y*. Such cases of underspelling frequently occur of perfect status verbs (see Chapter 4.1.19 for further discussion). The example is only included for reasons of completeness, as it was discussed by several authors in relation to a nominalised antipassive (MacLeod 2004: 323, Robertson, Houston and Stuart 2004: 285), an analysis not followed here (also see footnote 441). Furthermore, if the functional restriction applies, *chuk* cannot be nominalised this way as a root transitive verb.

720 All clear examples for *–yaj* are with the derived transitive verb *ip-a* (see Figure 58g for a passive example). Except a further derivation by *–yaj-el* (see footnote 441), all instances stem from nominal phrases of the structure *k'a[h]k' y-ip-yaj-Ø chan GOD* (Figure 82b-e).

721 This example and another from PAL TI-W, M11 are of unclear morphological segmentation, only included as a faintly possible case of nominalisation (cf. Stuart, Houston and Robertson 1999, II: 36). It is otherwise also interpreted as a perfect form (see footnote 939). The main argument to refute a nominalisation is the intransitive verb *we'* that rather requests an *–el* suffix (Figure 158e).

722 I do not follow the consideration that 1G4 is solely vocalic **a** or even ****aa** (Wichmann 2002b: 98), and the occurrence in examples such as **u=TZ'AK=AJ** is a rebus for ****u=TZ'AK=a**. The opinion to rebut a morphographic **AJ** in such environments abstains any morphological discussion and is based on graphematic considerations that are opposite to the viewpoints in this study.

723 Compare to the entries compiled by Boot (2009b: 17-19) which include nominalised verbs, e.g. **a pa-ya=la** < *a[j] pay-al*, "guide". Immediate agentive nominalisation of verbs is achieved by the *–om* suffix, but with the different semantics of a current (not habituative) execution or the potential to do so (Gronemeyer 2006b: 156).

724 There is one interesting spelling of the third person singular independent pronoun *ha'* with 1G4 on CRC BcM. 3, C4 as either **ha-a** < *ha'-Ø* or **ha=AJ** < *ha['\]-aj-Ø*, being "it is the he-person…" in the latter case. Note that Boot's agentive **jo-ch'o=K'AK'=AJ** is here taken as an inchoative (see footnote 704).

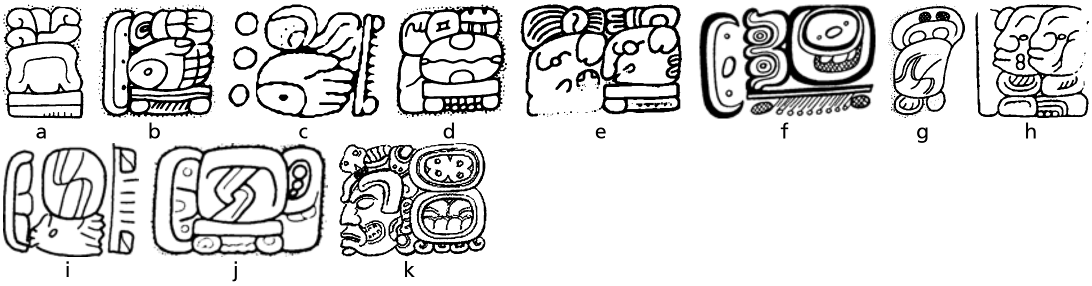

Figure 83: Examples of the putative agentive *–aj* suffix. **a) ya=TE'=AJ** (TZB Mon. 10, B3)[725], **b) u=K'AL=HUN=AJ** (PAL TFC, M12)[726], **c) 3=K'AL-TUN[ni]=AJ** (NAR St. 38, B6)[727], **d) K'UH=BAK=AJAW=AJ** (PAL TC, Q3)[728], **e) ba-hi si-hi=AJ** (YAX Lnt. 10, D1)[729], **f) u=TZ'AK=AJ** (PAL 96G, E7)[730], **g) u=TZ'AK-ka** (YAX Lnt. 23, M1a), **h) u=TZ'AK=a** (YAX HS. 5 II, 164), **h) u=TZ'AK[ka]=AJ** (COB P. D, 25), **i) u=TZ'AK=AJ[ja]** (SBL Str. A-14, T7, K'1), **j) u=TZ'AK=ji** (CPN St. 2, D9).

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725 Boot (2009b: 25) bases the agentive form on *atej*, "companion" (cf. **ya=TE'-je**, TZB Mon. 5, B2), supposed to base on the derived transitive verb **at-i*, "to accompany". It is not attested otherwise, but the onset is clearly indicated by the **ya=** sign for the ergative pronoun. The main sign ZZ5 also appears in the hieroglyph Riese (1982: 281-283) interpreted as "Sieger" (victor) to relate captive and captor. Based on the frequent affixation with **ye=**, Stephen Houston (cf. Stuart 1998: fn. 5) proposed the sign to read **TE'** ~ **ET** for the nominal root *e[h]t*, "companion, friend, work, likeness". This may be the result of a sound shift, as there are other examples of Early Classic [a] sounds changing in later times, e.g. compare to **ya=ATOT[ti]** (RAZ Bur. 6 East, B2). The phonology and derivations of *e[h]t*, especially their morphosyntax, remain poorly understood. For a more extensive discussion, see footnote 942, and footnote 734 for other examples.

726 This example is embedded in the context of conjuring a deity (PAL TFC, M10-12), being the *u-k'uh-il* of *K'inich Kan Bahlam* II. As an agentive compound, the aforementioned supernatural would be *u-k'al-Ø+hun-aj-Ø*, "he is the headband-binder-one of" the Palenque patron gods. The associated 9.12.18.5.17 date marks a dedication in the Cross Group (Houston 1996: 136), and the gods are enthroned as the owners. In this ritual context, the king is interestingly referred to with the mythological *k'uh mat[wil] ajaw* emblem glyph (Gronemeyer 2012: 32).

727 Parallel to the example in Figure 83b, the expression can be analysed as *ux k'al-Ø+tun-aj*, "triple stone-binder-one", as part of the nominal phrase of *Aj Wosal*. The preceding narrative mentions three subsequent K'atun endings celebrated by the Naranjo ruler whose titles are introduced with the agentive title. This is suggestive for the *ux winikha'ab ajaw* title directly following, as it may signal that Maya rulers acquire the *K'atun* count by their ritual action. But this only a deception, as *Aj Wosal* acceded to power on 9.5.12.04, while on NAR St. 27, Ap1 he is referred to as a 5-*K'atun* lord, if counted from the first *K'atun* ending since his accession, he must have been in power for already 106 years. Comparison to other sites and *K'atun* titles demonstrates, that the *ajaw* reference connects to the biological age, unlike the ritually conditioned *ch'ahom* count (Mathews 2011).

728 This expression initiates the king list of historical rulers on the Palenque Temple of the Cross Tablet, starting with the birth of *K'uk' Bahlam* I. The use of *tz'ak* within the numbered successor count is well established (Mathews 1975, Riese 1984). The use of **=AJ** with the Palenque emblem glyph is less an indicator to mentally replace with *tz'ak* here to read "it is the ordering of the divine Palenque kings". With the *–aj* suffix as an agentive, then the reading of the block can be resolved as *k'uh-bak[-al]-ajaw-aj-Ø*, "they are the divine Palenque king ones" that serves as an enumerator for the king list.

729 The expression stands in predicative position of a sentence naming *K'inich Tatbu Jolom* III as the subject. The syntagma does not allow an inchoative or absolutive interpretation of **=AJ**, hence we can analyse the block as *bah sih-aj-Ø*, "he is the head gifter-one" (with *bah* in the sense of "first, principal").

730 It is my proposition that the so-called DNIG or Distance Number Introductory Glyph (Riese 1984: 283-285, Thompson 1950: 160-162) with the abundant **u=TZ'AK=AJ** spellings and variants (Figures 83g-k) is also an agentive form. Previous discussions have to be separated in terms of the lexical class and meaning of *tz'ak* as well as the nature of the suffix. Kaufman and Norman (1984: 134) reconstruct the pCh **tz'äk* as a positional and transitive verb "complete // complete, whole; suficiente // enough". This meaning is for example taken by David Stuart to explain that "elapsed time of the Distance Number establishes a temporal whole" (Stuart 2003: 3-4) or 'completeness'. I rather follow Wald (2007: 144-145), who defines a semantic area of "to sequentially put in order", a meaning also successfully applied by Callaway (2011: 176-177) to the ordering of gods during the era day events. Transitive / intransitivised forms of *tz'ak* (see Figures 50r and 99l-m) result from the blur of positional roots (Wichmann 2002a: 7-8) with root transitives. Causative derivations of *tz'ak* (e.g. **u=TZ'AK=bu=li**, CRC BcM. 3, B3) prove the positional root class. If the **=AJ** suffix is agentive, it can thus derive positionals as well. The **=AJ** has been taken to spell the enclitic *=a'* (Knowlton 2002: 11), because of the example in Figure 83h. The idea is refused here because of the infrequent substitution pattern. Of the 216 samples of *u-tz'ak-aj* that were collected, only 6 do not apply **=AJ**. No author specifically discusses the potential ~ *–aj* nominaliser in connection

Besides the graphematic line of evidence, the agentive proposal for *–aj* also makes sense inasmuch it is semantically and functionally different from the abundant *–Ø* (and possibly –i, see Chapter 4.1.9) nominalisers. When the ‘intransitive compounds’ are in fact regular intransitive verbs with an often underspelled prepositional phrase (see Chapter 4.1.14), these nominalisers are reserved for transitives. Particularly, they form ‘transitive compounds’ that may be used for further derivation, such as the inchoative (Chapter 4.1.3), or these nominal constructions mirror the structure and function of the modern CHL ‘incorporating antipassive’ (see footnote 315).

The evidence for a ClM *–Vj* ~ *–aj* < =**ja** nominaliser remains faint, especially when compared to the linguistic evidence. Each example brought forward in favour of it can be interpreted a different way[731] as well. The only evidence for an *–aj* nominaliser is the one of agentive function, although it is not necessarily derivational. Most of the cases in Figure 83 are noun stems or nominalised compounds, although it is still to question whether *–aj* directly nominalises the positional root *tz'ak* (or an intermediate *–Ø* suffix is in place).

4.1.6 – Part/Whole Possession Marker *–el*

As the justification of the showcase definition in Chapter 2.1.1.2 shows, the sample attribution is largely connected to the delimitation to other possessive as well as abstractive and attributive suffixes. As the linguistic evidence in Chapter 3.1.2.1 shows, this is irrespective of the presence of a proper ergative pronoun to constitute a possessive phrase. Intimate or part/whole relationships can well be established by compounding.

Although the samples predominantly feature non-integrative spellings (Chapter 3.3.3.2.1), there is no reason to doubt a fixed-vowel *–el* suffix in ClM. None of the integrative spellings indicates a different vocalisation, and non-integrative syllabic spellings or those with a non-supportive phonemic complement are absent. Further support comes from the constant suffixation pattern (Table 73).

The few vowel-providing spellings among the part/whole possession marker feature a **CV-Ce=le** or **CVC=e-le** pattern for a *CVC-el* form, where we also can observe the final syllabogram alteration of a disharmonic **CV$_1$-CV$_2$** root spelling (Figures 84a, 85a). The affixation with =**le** mirrors the suffix vowel.

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with *tz'ak*, but Boot (2009b: 176) itemises *tz'akaj* as a noun for “count, accumulation”, making the DNIG a stative predicate. The syntactic role would remain the same with the agentive interpretation of =**AJ** that is preferred because of the graphematics with the sign 1G4. In that case, the DNIG might translate as “it is the order-putter-one”, referring to time as an animated concept. That makes the Distance Number, embodying the lapse, the agent not only to order time, but also to put history in sequential order.

[731] Lacadena (2004b: 178, fn. 107) quotes the name of Ruler 16 of Copan, where **pa-sa=ja** ~ **PAS=ja** is to make use of a nominalisation of *pas*, “to open, to uncover”. In his opinion, a passive “would fail to make any sense in the context of the theonym”, hence he understands the name as “*Yop-At* is the First Opening (‘dawn’) in the Sky.” I see no reason not to consider a passive analysis that likewise results in a valid syntagma: *yax pa<h>s-aj-Ø chan yop+at*, ‘ADV uncover<PASS>-THEM-3SG.ABS heaven *yop-at*’ to translate as “Firstly was Uncovered the Heaven-*Yopat*” (see footnote 696, where *chan yopat* also appears as the agent of a sentence name).

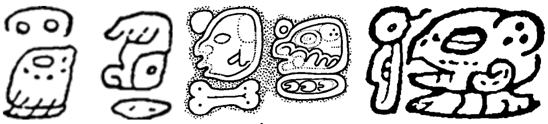
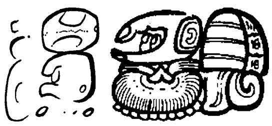


Figure 84: Examples of inherent possession with integrative standard suffixation spellings. **a) u=ba-ke=le** (YAX Bur. 2 85, A1-A2), **b) IX BAK=e-le** (XLM Jmb. 8, Ap2-Ap3), **c) TE'=e-le** (TIK MT. 176, D1)[732].

A disharmonic spelling pattern among the suffix is only attested with two samples of a vowel-providing spelling (Figure 85). Otherwise, a spelling with a root final **Ce** sign ensures a fully phonemic rendition. The example in Figure 85a is therefore especially important (see Chapter 2.2.1), as the usual **BAK**[ki] complementation pattern is altered to **BAK-ke**, a graphotactic choice that also argues against morphosyllables (Gronemeyer 2011b: 331-332).

[732] As indicated in Chapter 2.1.1.2, one question critical with regard to the showcases of control group 2 is the attribution of the abundant *te'-el*. I consider it to be in an inherent possession with *kakaw* in the PSS, as it is often qualified or specified by a preceding noun or adjective. Common is *tzih-il (te'-el) kakaw*, e.g. K4542, C-E, K4991, B-C) to indicate "fresh" as an attributive (Grube 1990b: 326), commonly spelled **tzi-hi=lV** (Figure 90u). Lacadena (cf. Beliaev, Davletshin and Tokovinine 2009: 257) tried to connect the so-called "gogo tree" (see below) with a segmentation of *ixte'[el] kakaw* (e.g. on K4689, G-H). But the interpretation is based on the confusion between the signs PE8(2) and PC1 with the latter's **IX** reading (cf. García Campillo 1994b). The reading for PE8(2) was later changed by Stuart (2006a: 197-198) to **IXIM**. Still, no consensus on the meaning of *ixim te'-el+kakaw* is found (Beliaev, Davletshin and Tokovinine 2009: 197-198, Hull 2009b: 248), as it may either designate a specific species or relate to maize mythology. In this context, **ta IXIM ya=TE' ka-wa** < *ta ixim y-ate[j] ka[ka]w* (K558, K2206, K2352, F1-H1; all part of the 'Fenton school' group [de Castro 2005]) is highly interesting. In the position where *te'-el* would normally stand, the word "companion" (see footnote 725) is used, showing that *ixim* is probably some ingredient mixed with the cacao, and *te'-el* otherwise pertains to cacao and not to *ixim*. The assumption is also supported by the couplet *ixim+ka[ka]w te'-[e]l ka[ka]w* on K5857, F1-I1. Otherwise, Boot (2009b: 174) reads the female head sign as **tzi** and assumes an EM vernacular ***tziy*, "nixtamal" because of the provenance of the vessels from the Alta Verapaz region. Likewise, the basic meaning of *te'-el kakaw* is not clarified (cf. Boot 2009b: fn. 119, Hull 2009b: 240). On the one hand, *te'-el* in a PSS context could just be a collective abstractive by *–Vl*, as already supposed by Stuart (1998: fn. 3); cf. CHR *te'eh*, "trees, grove, forest" (Wisdom 1950: 670), CHN *te'e*, "montaña, selva, bosque" (Keller and Luciano 1997: 235), and CHL *te'el*, "bosque" (Aulie and de Aulie 1978: 88). Many expressions (Keller and Luciano 1997: 235) with *te'el* pertain to forestal flora and fauna; i.e. anything wild and uncultivated, such as *te'el ajmis*, "gato de monte" or *te'el chab*, "miel de monte". Most notable is CHN *te'el cäcäw*, "gogo", defined as "[…] una clase de árbol que crece en la montaña; da fruto redondo como si fuera verdadero de cacao. La semilla es dulce y se chupa, pero no sirve para otra cosa." This has to be a folk taxonomy based on the fruit shape. Although no correlation to a species is given, a hint comes from a missionary report from the Philippines (Villacorta 1833: 81), where among agricultural products "la enredadera llamada gogo" is described. The only climbing plant from the circum-Caribbean area with cacao-like fruits is *Sechium edule* (Browne 1756: 355) of the family of *Cucurbitaceae*; known as *chayote*, *pataste*, or *güisquil* in Central America. CHR also provides *te'er*, "tree-like, growing like a tree" and *te'erar* "the 'tree' part of any fruit" (Wisdom 1950: 670). This qualitative specifier can also form other compound names, such as CHN *te'el chij*, "guarapo" (Keller and Luciano 1997: 236). In CHN, the proper *Theobroma cacao* tree is named *te' cäcaw* instead, as other tree species are simply *te'* plus another noun (Keller and Luciano 1997: 234-235). In relation to the CHN *te'el cäcäw*, this suggests a qualitative description, that the fruits are only like the husk yielded from the true cacao tree (and possibly converging with the 'wild' semantics). As residue analyses (e.g. Hall et al. 1990) attest the proper use of *Theobroma*, the mention of *te'el kakaw* in the PSS cannot indicate any other species, such as gogo. In comparison with the lexical evidence it seems unlikely that the *–el* suffix is abstractive or attributive, but rather indicates some intrinsic quality of *te'* in an inherent relationship. It may refer to the fact that the cacao husks directly grow from the trunk. The part/whole relation is also supported in comparison with other 'ingredients' that are not appearing with the attributive $-V_1l$ suffix: foodstuffs like *ixim*, "maize" (e.g. K5857, F1), or *ul*, "atole" (e.g. K6617, F1) never appear with a corresponding attributive **=lV** suffixation, refer to the discussion of the semantics of attributive nouns in Chapter 4.1.7. There are only two exceptions: an example of **ka-wa=la** < *ka[ka]w-al* (K2777, G1, see Figure 90h) and with two examples of *sa'-[a]l* < **SA'=la** (TIK MT. 3, B1 and K6813, D1, see Figure 95h).

Interesting are the cases of *bak-el* in Figures 84b and 85 that appear in a nominal and a prepositional phrase, respectively. No ergative pronoun relates to another noun, nor seems the intimate possessor expressed at all. There are similar examples from CHL (see footnote 251), when implicitly referring to a person's body part, although the reference remains mysterious in the given examples[733].



a b

Figure 85: Examples of inherent possession with integrative other suffixation spellings. **a) ti BAK-ke=la** (CML U. 26 Pdt. 15, A6), **b) ye-tz'e=li** (TIK MT. 9, C1)[734].

In the majority of examples (Figure 86), the root is simply represented by a morphographic spelling **CVC=le** with a *CVC-[e]l* transliteration, where the suffix spelling is synharmonic to the suffix vowel in a 2.e.i scheme. It is again important to consider the context in case the possessor is oblique (see the individual footnotes for Figure 86) to determine the paradigms under which part/whole suffixation takes place.

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733 However, Zender (2004c: 259-260) relates the nominal phrase of *K'inich K'an Tok Mo' K'uh Bakal Ajaw* (CML U. 26 Pdt. 15, A8-A10) to follow as the possessor, hence on this pendant *Aj Pakal Tahn* would commence bloodletting with the king's bones. However, on CML U. 26 Pdt. 16, A6 this is said to happen *y-ich-nal*, "in the presence of" the same person. Zender considers him to be a deceased ancestor, as there are also no other historic record. On CML U. 26 Pdt. 15, block A7 with **?-HAB=la** directly following *ti bak-el* remains unexplained in Zender's analysis and may rather introduce a new sentence. If the bones would belong to *K'inich K'an Tok Mo'*, the prepositional phrase would necessarily be **tu-bak-el*.

734 Proposed translation for *yetz'*: "reflection". Compare to the singular CHN *yetz'*, "reflection in water" (Knowles 1984-88). For the decipherment proposal of the sign ZD6 as **li** see footnote 101. Albert Davletshin (written communication, June 11, 2011) proposed the collocation spells *yatz' ~ yätz'*, "squeezed", and it is possible that a **Ce** sign was chosen to approximate the [ə] sound of the schwa vowel in the pCh and WCh sound system, but sufficient other examples prove, that if it was present in ClM, **Ca** signs were rather used to represent it (see footnote 169). Therefore, an inherent possession of *yetz'*, "reflection" with the following *k'an na[h]b-nal*, "yellow/precious lake-place" is likely, as a water surface usually reflects. However, there are instances, where /a/ and /e/ interchange, as proven by syllabic spellings or complements (see footnote 725). The contexts are quite restricted, but not limited to the cases of *ebet ~ abat* (e.g. **ye=EBET**[ta] on K5453, R1 and **ya=ba-ta** on PNG P. US Collection, B6). See footnote 459 for a discussion of the reading of the sign BM5 and note that in the context of K5453, Zender (2005b: 13) proposes the syllabic value **be** instead. Another instance may be the 'stinger' glyph (Lopes 2005c) supposedly representing a (shark) tooth, often prefixed by a **ya** sign in Early Classic inscriptions (e.g. YAX Lnt. 37, D5). On CML U. 26 Pdt. 17, A4, we find a full syllabic spelling for "tooth" with **ti 1 ye=je XOK**[ki] < *ti jun y-ej xok*, "with a shark tooth." Hence, the 'stinger' glyph may be morphographic **AJ ~ EJ**.

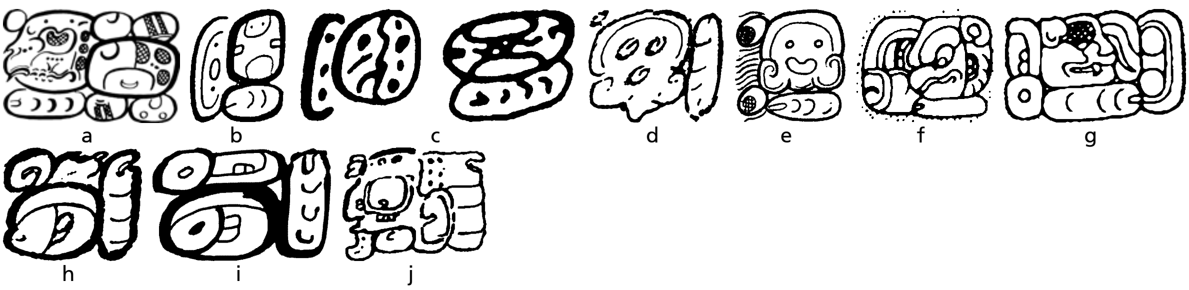

Figure 86: Examples of inherent possession with non-integrative standard suffixation spellings. **a) BAK=le** **waWAY=wa=la** (PAL 96G, I2)[735], **b) u=BAK=le** (CML U. 26 Sp. 6, A4), **c) u=WAY BAK=le** (COL K1256, Q3-Q4)[736], **d) CH'ICH'=le** (COL K1457, G4)[737], **e) u=CH'ICH'=le** (PAL T19B-S, E5), **f) ta OK=le** (PAL TFC, G2)[738], **g) u=yo=OK=le TE'** (YAX Lnt. 25, I2)[739], **h) TE'=le** (RAZ K1383, A7), **i) TE'=le** (MTL K1004, M1), **j) TE'=le** (COL K7912, G3).

Four of the five examples that feature a **CVC=lV** realisation with a scheme 2.e.ii spelling disharmonic to the suffix vowel are shown in Figure 87. They are functional equivalent substitutions to the standard pattern.

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735 The drawing by Robertson (1991: fig. 265) is deficient as it does not appropriately render the **WAY** sign, accordingly corrected in the illustration. See Figures 87a and 88a for spelling variations. The *bak-el way-w-al* is used as a title by *K'inich Bahlam* II, see footnote 64 on previous interpretations. For *way-w-al*, I add another one by assuming a hypothetic derived transitive verb from the noun *way*, "co-essence" (Houston and Stuart 1989). It helps to explain the suffixation with *–w* either as the passive of derived transitives or as an antipassive. One caveat against a passive is the nominalisation, that would be expected as *–w-aj-al*, see Chapter 4.1.1 and Figure 61j-n. The *–w-al* may also relate to the TZE *–w-il* agentive suffix that involves an intermediate antipassive (see footnote 459) and can be used to explain certain ClM nominalisations. The exact meaning of *way-w-al* of course depends on the correct morphological analysis, but "bone-transformer" may come close.

736 The phrase *u-way-Ø bak-el* specifies the possessor relation of the *way* named the *Sak Bak Naj Chapaht* (Grube and Nahm 1994: 702). Hereby, the *bak-el* is suspected to refer to Palenque, but its emblem is usually spelled with **=la** to mark the suffix (e.g. PAL OVAL, D3), and not **=le**. When *way* figures are connected with emblems, these are usually given as the full emblem glyph (cf. Calvin 1997), connecting this *way* to the social role of a ruler (cf. Gronemeyer 2012: 32) in his polity. The use of *bak-el* as the possessor implies that body parts can have their own *way*, as further supported by the *Poopol Wuuj* episode with the mosquito (see footnote 65). The absolutive cases of *way-as* (Zender 2004b: 200-204, fig. 8.2a) vice versa support evidence for a bodily connection of 'alter ego' figures.

737 The **CH'ICH'** ~ **K'IK'** reading was made by David Stuart, based on unpublished evidence (cf. Stuart 2005b: 76). For a syllabic spelling that (dialectally?) indicates *k'ik'*, see Figure 143b. The 'whole' to which *ch'ich'* relates is spelled in the following block as **mi-ya-tzi** < *miyatz*, referred to by several as a "wise man" (2009b: 129, Houston, Stuart and Robertson 1998: 280, Lacadena and Wichmann 2004: 149).

738 The context for this example is *u-bah ta ok-el ba[h] ch'ok* (PAL TFC, G1-G3). Together with the example in Figure 86g, it seems unlikely that *ok* is used in its anatomical meaning "foot". In comparison with *k'ab-as* < **k'a-ba=si** (TIK MT. 48, A7a) and the related *–Ø* possessive paradigm (Zender 2004b: 200-204), one would not expect an *–el* suffix. A different suffixation may hence indicate a polysemic meaning, a 'grounding' or 'standing'.

739 The example of *u-y-ok-[e]l te'* is interesting for a couple of reasons. The relation between *ok* and *te'* seems to be the same 'impersonal possession' of construction parts described in Chapter 3.1.2.1. Hereby, *ok* is likely not to be understood in its anatomical sense (see footnote 738). It follows an impersonation statement (cf. Nehammer-Knub, Thun and Helmke 2009) of *Ix K'abal Xok* (*u-bah-il a[h]n ix o[h]l wi[l]-te' nah*, G1-G2) in the founder shrine (cf. Davletshin [2010: 16-20] for etymological considerations). As local 'copies' of the original Teotihuacan shrine (possibly the Adosada platform of the Sun Pyramid [cf. Fash, Tokovinine and Fash 2009: 213-214]) are mentioned in the text of several Maya sites, *y-ok-el te'* may therefore relate to a base/pedestal for *te'*, best understood as a metaphor for 'lineage' (cf. Martin and Grube 2000: 88), or a physical icon. This happened *ta[h]n ha' pa'-chan* (I3), "in the centre plaza of Yaxchilan." The expression is again possessed by *Ix K'abal Xok*, hence the second 3SG.ERG *u–* prefixed to it.

a b c d

Figure 87: Examples of inherent possession with non-integrative other suffixation spellings. **a) BAK=la WAY=wa=la** (PAL T14T, D10), **b) CH'ICH'=la** (SUF M. 7, C9), **c) IXIM TE'=la** (COL K3699, H1), **d) TE'=li** (COL K511, C1).

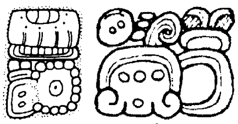
There are only a few cases of underspellings of just a morphographic root with a scheme 2.g.ii in formulaic expressions (Figure 88), resulting in **CVC=Ø** for a *CVC[-el]* form. These especially occur in compacted texts, as the example in Figure 88b for *te'[-el] ka[kaw]* shows. The *bak-el way-w-al* title can even be written by simply **BAK WAY** (e.g. PAL TC, K3).

a b

Figure 88: Examples of inherent possession with underspellings. **a) BAK WAY=wa=la** (PAL TFC, O3), **b) TE' ka** (BPT Bur. 2 Msc. 2, E1).

As Chapters 3.1.1.4 and 3.1.2.1 elaborated in conjunction with the previous epigraphic discussion by Zender (2004b), two absolutive/possessive patterns are part of the showcase: (1) *–Ø* [-POSS] vs. *–el* [+POSS], and (2) *–aj* / *–is* [-POSS] vs. *–Ø* [+POSS]. As the paradigms are mutually exclusive also in terms of their semantics, no word of one of the two classes is expected to appear with one or the other pattern.

There are two examples (Figure 89) that appear as a direct violation, as the noun appear with an *–is* suffix instead of *–Ø*. While the case with *ti'* and *ch'ich'* may have an easy solution (footnote 741), the case of *bak-Vs* is less obvious (footnote 740).



a b

Figure 89: Examples of deviant absolutive spellings of part/whole possession nouns. **a) ba-ka=si MO'** (PUS St. E, Dp9)[740], **b) TI' CH'ICH'=si** (SCU St. 1, A7)[741].

[740] The transcription can be suggested as *bak-as* because of the altered root spelling from **ba-ki**. This may support ~ *–as*, instead of only *–is*, as suggested by Zender (2004b: 200-204). Spellings such as **WAY-ya=si** < *way-as* (K2777, J1) or **o-la=si** < *o[h]l-as* (COL Shl. YUAG 1973.88.34j, A1) provide support, if they are considered in favour of vowel-providing spellings in contrast to group 2 spellings, such as **WAY**^{ya}**=si** < *way-[i]s*. Linguistic evidence is provided by PQM *–is* ~ *–es* (Santos Nicolas et al. 1997: 68-69), a survey of body parts (Cú Cab' et al. 2003: 76-95) does not reveal alternate vocalisations. It is possibly, though, that the same orthographic principle as suggested for the *–aj* absolutive (Chapter 4.1.4) applies: besides a constant =**si** suffixation pattern for a fixed-vowel suffix, the original harmony pattern is retained and is not integrative (as e.g. with **BAH**^{hi}**=ja** < *bah-[a]j*, Figure 80a). In any case, there is no reason to doubt that **ba-ka** spells *bak*, "bone" instead of a different noun that may come along with *–is*, so the use of this absolutive suffix must remain mysterious.

[741] The suffix seems to be attached to *ch'ich'* because of graphotactic reasons, but it is more likely to be suffixed to *ti'*. Zender (2004b: fig. 8.2d) has *ti'-[i]s* (K1440, E1) attested. Compare to *ch'ich'er uta'* [sic!], "gum or mouth bleeding" (Wisdom 1950: 720), where *–er* is used to indicate the body's own exsanguination (similar

There is little doubt imposed by the epigraphic evidence that part/whole possession generally follows a *(u-)CVC-el* ~ *(y-)VC-el* pattern. It can phonetically be analysed as a canonical bi- or trisyllabic form, depending on the presence of the ergative pronoun or a glottal onset, i.e. *[CV.Cel] and *[ʔV.Cel] or *[ʔu.CV.Cel] and *[jV.Cel].

More complex are the morphosyntactic paradigms of a noun suffixed with *–el* in relation to the role of the suffixed noun in the syntagma. There are three environments: (1) the single argument (3SG.ERG-)NOUN$_{\text{PATIENT/AGENT}}$, (2) the possessive phrase 3SG.ERG-NOUN-POSS-3SG.ABS$_{\text{PRED}}$ NOUN$_{\text{AGENT}}$, and (3) the compound NOUN-POSS(+NOUN). In the first case, the noun has a facultative ergative pronoun (compare Figure 86b with 86g) in case of an implicit part/whole relation, but is always an argument to a predicate, which can be stative. In the second paradigm, the noun is obligatory possessed as the stative predicate in a possessive phrase. In the last case, the ergative is always absent and the second noun is oblique when the possessor is implicit. This construction can appear anywhere in the syntagma, such as in a nominal phrase (e.g. Figures 84b, 86a, d), or a prepositional phrase (e.g. Figures 85a and 86f), for which the 'ingredient list' with *te-el+kakaw* is the prime example.

The paradigms make it apparent that the application of *–el* is more diverse than a comparison with grammars suggests. This also concerns the range of nouns. Although not a body part, Zender (2004c: 204) discusses the case of **^{2}k'a=si** < *k'a[h]k'-[i]s* and considers the fire to be understood as a symbolic extension of the ruler's body. The same fuzziness is attested with polysemic meanings of body parts (Figure 86g-h).

Otherwise, the different noun classes and semantic nuances visible by *–el* contrasted with *–il* for other body parts can be demonstrated by pairings and their comparison. The example from Figure 86b is embedded in a larger phrase: **wi-tzi=ja u=BAK=le u=JOL=li** < *witz-aj-Ø u-bak-[e]l u-jol-[i]l*, "made to mountains were their bones and skulls." Although an empirical survey as done for the *–el* suffix is pending for other *–Vl* possessive markers (Houston, Robertson and Stuart 2001b: 26-30), they are definitely not realised by **=le**, showing an orthographic distinction of the suffix function[742].

In summary, the canonical spellings for the part/whole possession are provided in Table 79. Because of the very uniform pattern attested in Table 73, the results from the sampling largely match the expected forms of the hypotheses (Table 30), although with less complexity.

constructions appear with other body parts as well). With an unpossessed *ti'* in the glyphic example, **=si** should belong to it and one might suspect an underspelled **=le** for *ch'ich'*.

[742] Such distinction also makes sense from a semantic point of view. Body parts of part/whole possession can take an *–il* suffix instead, when they are dismembered (see footnotes 250 and 253 for examples). The different meaning can thus easily be expressed by a single grapheme, i.e. the syllabogram indicating the suffix. If *–Vl* possessive suffixes where all indicated by the same **lV** sign, phonemic and semantic ambiguities would arise, unless clarity is provided by an altered syllabic spelling or an additional syllabogram in case of a morphographic root. Besides the visual guide, this is also a question of 'writing economy' (see Chapter 4.2.2.2).

Type	Transcribed Paradigm	Canonical Spelling
-POSS CVC NOUN	*CVC-el*	**CV_1-Ce=le / CV_1C-Ce=le / CV_1C=e-le**
		CV_1-Ce=lV / CV_1C-Ce=lV
	CVC-[e]l	**CV_1C=le**
		CV_1C=lV
	CVC[-el]	**CV_1C=Ø**

Table 79: Morphological paradigms and canonical spellings of inherently possessed nouns.

4.1.7 – Attributive Nominal Suffix *–V_1l ~ –el*

Although the sampling has not attested firm evidence for the ~ *–el* allomorph of CeC roots, other *–V_1l* samples have nevertheless been collected for comparative purposes. Likewise, the purpose for *–V_1l* patterns collected in Chapter 3.1.2.2 was to cross-check the validity of the proper control group 1 ~ *–el* alloforms and its semantics. All *–V_1l* forms must now serve as the evidence for discussion, also providing a broader perspective. As its own showcase, the attribute *–V_1l* would rather have been a control group 2 case.

Although the statistical analysis (Chapter 3.3.3.2.2) fully supports the preference of vowel-providing spellings, the significance is still weak. Furthermore, no consistent suffixation pattern can be determined (Chapter 3.4.2), but a rather high orthographic diversity with a considerable evenness (Table 73).

It is also important to pursue the question with which nominal roots the *–V_1l* suffix appears and in which semantic contexts (discussed in the footnotes accompanying the figures). The question how often suffixation occurs under such conditions must be answered with less precision. Even in equivalent substitutions, the problem remains whether the absence of any graphemic suffix marking is the result of an underspelling, simply a facultative omittance, or a different semantic emphasis. This question is more important for the grammar, but less for the focus laid here on the orthographic principles for the attributive suffix.

The disambiguation of the attributive from other *–Vl* suffixes has to rely on the context, as well as the etymology and lexical class of the base[743]. It must be distinguished from participles, although these can function as attributive adjectives with a homophonous *–V_1l* suffix[744].

[743] One example is *y-ut-al*, analysable as '3SG.ERG-fruit-POSS' and usually translated as "fruity" in an adjectival manner (cf. Beliaev, Davletshin and Tokovinine [2009: 258-260] for a discussion of "fruit(y) cacao"). It cannot be attributive for two reasons: (1) the suffix is vowel-disharmonic, although such cases are known (Figure 94), and (2) although the attributive can be part of a possessive phrase (e.g. Figure 90l), *(h)ut* (note the /h/ elision upon possession, see footnote 431) stands in relation to *kakaw*. I partly base my argument on **u=yu=ta=la** < *u-y-ut-al* on COL Berlin IV Ca 50113, H1 (Grube and Gaida 2006: fig. 33.1) that features a double possession. The possessor is a *kelem* person, to which *u–* refers to, while *y–* relates the fruit to *kakaw*, which is not explicitly written in this PSS. It may refer to the addition or sole use of the fermented cacao fruit pulp (cf. McNeil [2006: 345-346] for modern use). Middle Formative vessels from Puerto Escondido were positively tested on cacao residues, but their use for an alcoholic pulp beverage solely relies on the vessel shape (Henderson et al. 2007).

[744] Therefore, **pi-tzi=li** < *pitz-il*, "ballplaying" (e.g. K7050, O1), is excluded from the showcase, while Houston, Robertson and Stuart (2001b: tab. 9) discuss it, see footnotes 611 and 671 for the consideration of a transitive root. Other examples are **CHAM=la HAB** < *cham-[a]l hab* (PAL TI-M, H5) as "deadly year" (cf. Lacadena [2006: 210, fn. 8] who parallels the texts from the Temple of the Inscriptions to prophecies in the *Chilam Balam* books), **9 tz'a-pa=la K'UH** < *balun tz'ap-al k'uh*, "nine planted gods" (K2914, M1), and the more lexicalised **nu-**

Synharmonically spelled roots with a synharmonic suffix spelling (Figure 90) comprise the qualitative majority of samples, not requiring spelling alterations: **CV$_1$-CV$_1$=lV$_1$ / CV$_1$C-CV$_1$=lV$_1$** for *CV$_1$C-V$_1$l* forms. These cases classify as a 1.a.i scheme. A few cases following a 1.e.i scheme take a morphographic root with a synharmonic suffix spelling of the pattern **CV$_1$'=V$_1$-lV$_1$** to provide a fully phonemic rendition (Figure 90m).

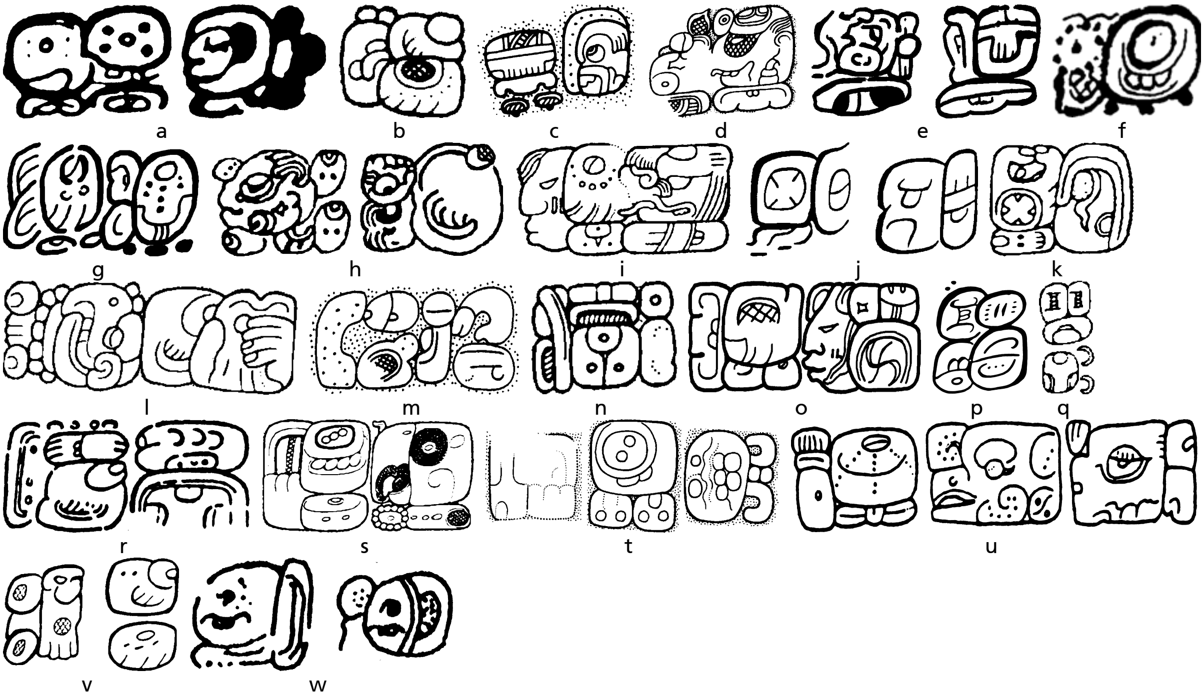


Figure 90: Examples of attributive nominal suffixes with integrative harmonic spellings. **a) TAN^{na} bi-hi=li CHAM^{mi}** (MTL K791, I'1-J'1)[745], **b) AJ ^{2}bu=lu HA'** (PNG P. 2, J'2)[746], **c) CHAN-na=la K'UH** (COL Yax Wayib, A6-B6), **d) ^{chi}CHIH-hi=li AKAN** (TRT Mon. 6, E1-F1)[747], **e) chi-hi=li ? CHAN^{na}** (COL K1901, R1-R2)[748], **f) ch'a-ja=la** (COL K1339, B1), **g) ka-ba=la pi-tzi=la** (COL K7749, I1-J1), **h) ka-wa=la u-lu** (COL K2777, G1-H1), **i) IX k'a-ba=la XOK^{ki}** (YAX Lnt. 25, R2-S2), **j) K'IN-ni=li cha-ki** (CML U. 26, Sp. 5, A4-A5)[749], **k) K'IN-chi=li KAB** (NAR St. 22, E14), **l) u=K'UH-hu=lu TZAK** (YAX Lnt. 42, E3-F3), **m) K'U'=u-lu ^{a}AT^{ta}** (YUL Lnt. 1, C5-D5)[750], **n) CH'AK=ma-ka=la TE'** (CRC Alt. 13, 21)[751], **o) na-k'a=la IX TZ'AK AJAW** (PAL TI-W, Q5-R5)[752], **p) ^{2}po=lo tz'i-i** (COL Shl. Berlin, F1), **q) po-po=lo cha-ya** (YAX HS. 3 I, E1-E2), **r) u=^{2}su=lu me-se** (CRC BcM. 3, D5-C6)[753], **s) ta-ja=la MO'^{o}** (MQL Str. 4 Frg. V, 2-3)[754], **t) CHAK ta-ja=la WAY** (OXP St. 10, B4-B6), **u) ti tzi-hi=li ka-wa** (COL Berlin IV Ca 44347, H1-J1)[755], **v) u-tzu=lu ba** (CML U. 26, Sp. 5, A8-A9), **w) xi-ni=li CHAM** (NAR K927, S2-S3)[756].

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pu=la < *nup-ul*, "counterpart" (from *nup*, "to join") used in the name of a *way* figure (cf. Grube and Nahm 1994: 692). Equally excluded are adjectivised inchoatives (Chapter 4.1.3) in attributive position such as **CHAK=ja=la TE'** < *chak-j-al te'* (DCB St. 1, J2b), as they account as participles as well.

[745] It is the name of an avian *way* (Grube and Nahm 1994: 704), clearly marked as a predator by the beak form, swooping down. The preposition *ta[h]n* and the attributive use of *bih*, "road, path" characterise the "amidst the road death", a fatality that happens en route, evoking the cross-roads mentioned in the *Chilam Balam* books (Helmke and Nielsen 2009: 62). This makes *bih-il* to qualify *cham* as the circumstance of death that e.g. does not happen at home, ultimately imposing the concept of *kàaj* and *k'áax* described in Yucatan (cf. Le Guen 2005, Stone 1994: 15-18, Taube 2003). This example is also good evidence that the attributive does not necessarily impose an adjectival use, as a "roady death" is of little sense in a prepositional phrase.

[746] No satisfactory translation can be given for *bub*, as the range of meanings is broad. Boot (2009b: 38) offers *bub*, "cylinder, column" and *bubul*, "cylindrical", based on YUK evidence (cf. Barrera Vásquez 1993: 67), as the root is attested on columnar objects; but also "conch" as the possible basis. Another explanation for bub could be "pollywog", based on CHR "tadpole" (Wisdom 1950: 591) and YUK "renacuajo". YUK also has *bubulha'* as "insecto acuatico, como escarabajo", "animalillo del agua de los estanques que forma burbujas". Also attested is YUK "vela de navegar" and "pabellón de cama", but the use of sailing ships is not attested for the Classic period;

contrary to the rowing of canoes by archaeology (McKillop 2005: 5632-5633), iconography (as e.g. by the identification of the 'Paddler Gods' [cf. Mathews 2001b: 399]), ethnohistory (e.g. Landa 1959: 8, 10), and ethnography (Hopkins, Josserand and Cruz Guzmán 1985). As *bub-ul ha'* is a toponym (see the gentilic use in Figure 97a), it less likely refers to some lacustrine species as the YUK example, but to a specific body of water that is qualified as the biotope of such species. The interpretation "Water Where the Tadpole Abounds" (Lacadena and Wichmann 2005b: fn. 3) arrives at a similar conclusion, but by considering the *–ul* suffix to originate from the authors ***–u'l* toponymic suffix (see footnote 762).

[747] This reference may relate to a possible aspect of God A' (Grube 2004a), as a god for *pulque*. In this relation Grube (2004a: 62-63) refers to an impersonation statement: **u=BAH=AN[nu] 3=PIK AKAN[na] ti [u]UK'=CHIH[hi]** < *u-bah[-il]-a[h]n-Ø ux pik akan ti uk'-Ø+chih*, "it is the image of *Ux Pik Akan* in *pulque*-drinking" (CPN Alt. U, J5-L2). Besides a "*pulque*-like *Akan*" (Gronemeyer and MacLeod 2010: 45), this attributive may also highlight God A' as the personification of *magey* leaves as the basis for *pulque* (cf. de Smet 1985: 55-69).

[748] It is the name of a *way* (Grube and Nahm 1994: 693) merging features of a snake and a deer, discussed by Helmke (2013: 9, tab. 1) as part of calques along other serpent names. Kettunen (2006: 100) cites an interesting TZE folk taxonomy with *chihil chan* for the chicken snake *Spilotes pullatus*, as well as the Nahuatl loan *masakwáto* for *Boa constrictor*, cf. the Nahuatl *mazācōā-tl*, "a type of horned caterpillar or a type of large, nonvenomous snake, a boa" (Karttunen 1983: 142). The attributive use of *chij* is less for the appearance of the snake (although the *way* combines the physiognomies), but possibly for behavioural reasons, as Sahagún (Anderson and Dibble 1950-82, XI: 79) explicates: <*Maçacoooatl:* [...] *In jquac omacic, ça onoc acampa vtlatoca: in qujqua tochin, maçatl, tototl çan qujhioantoc.*> – "When mature, it only lies somewhere, where they travel the road. When it eats the rabbit, the deer, the bird, it just lies attracting them with its breath." Karttunen (1983: 142) further explains on the Nahuatl etymology: "[t]he literal sense of the name 'deer snake' probably refers to its alleged diet rather than to any aspect of its appearance." That *chijil* is not used in an adjectival manner is further testified by **ta SAK[ki] chi-ji=li WAJ[ji]** < *ta sak chij-il waj*, "for white venison tamale" (K6080, K1-O1) and **ta SAK chi-hi=li WE'** < *ta sak chi[j]-il we'*, "for white venison food" on K5460, P1-R1 (Zender 2000: 1044-1045). Hereby, *sak* qualifies *chijil*, and *sak chijil* as a whole likely refers to the filling of a *tamale*. It is uncertain, whether *sak chij* is a folk taxonomy among the genus *Odocoileus* or a specific type of meat, either by the cut or the preparation method. Another unresolved issue is **chi-ji** ~ **chi-hi** upon suffixation that may simply result from the loss of orthographic distinction (Grube 2004d) or indicate a lenition process (see footnote 523) of the root coda spirant.

[749] The analysis assumes *k'in-il cha[h]k*, "sunny *Chahk*", but is known that *k'inich* can seldom be underspelled this way, e.g. in the *taj-al chan k'inich* epithet of *Yax Nun Ahin* I (Figure 92d). Hence, *k'in[ich]-il cha[h]k* may likewise be an option, but with less probability.

[750] For the discussion why to assume a Yukatekan **K'U'** value in contrast to **K'UH** based on Ch'olan languages, see Gronemeyer (2011b: 327). This possibility was first brought forward by Boot (Boot 2009b: 118). The argument that **=u-lu** supports the Yukatekan pronunciation finds support in comparison with other 1.e.i or 1.e.ii spelling schemes that occur with **CV'** roots (see Figures 84c, 127e, 145m). If the cases of **K'U'** are included there are 11 against 4 samples (two each with *bak* [Figure 84b] and *il-a*).

[751] This example can be analyses as *ch'ak-Ø+mak-al te'*, where the nominalised transitive root forms a compound with *mak*. The attributive is likely not be understood as a participle of *mak*, "to cover", but as the corresponding noun, "covering, enclosure", cf. CHR *mahk*, "anything enclosed or stopped up, congested, congestion", *mak*, "an enclosing, a covering, a stopping-up, a plugging, obstruction, [...]" (Wisdom 1950: 521). It can be used in compound expressions, notably *mak te'*, "fence (of limbs or growing spiny plants)" (Wisdom 1950: 522), also attested as CHN *mäcte'*, "cerca (de palos)" (Keller and Luciano 1997: 157). Similar is YUK *mak*, "cepo para coger venados o tigres" (Barrera Vásquez 1993: 479) and *makche'*, "cepo de madera" and for *Ximenia spp.* (Barrera Vásquez 1993: 482). Grube and Martin (Grube and Martin 2004: 85) believe that the expression refers to the "'axing' of Makalte", identified with the kneeling captive presented to *K'inich Tobil Yopat* by the Ucanal ruler *Papamalil*. But the context is more complex, the expression follows an eroded transitive verb **u=ma-?=wa** and precedes a likewise weathered prepositional phrase. On the basis of the lexical evidence, a war action seems likely that either refers to the attack against a place called *makal te'*, or specifically to the destruction of fortifications. The caption accompanying *Papamalil* reads **u=BAH ti ?[na] CH'AB=li ma-ka=la TE' pa-pa-ma-li-li** (CRC Alt. 13, F1-F4), it is introduced by a formula similar to those used for bloodletting (Gronemeyer 2003: 12, fn. 4, Proskouriakoff 1973: 172), the meaning of *makal te'* must remain opaque here.

[752] Proposed translation for *nak'*: "belly, stomach". See CHN *näk*, "groin, belly", *näk'-a(n)*, "to become big in the stomach" (Knowles 1984-88), CHL *ñʌc'*, "estómago" (Aulie and de Aulie 1978: 63), and CHR *nak* [sic!], "stomach, stomach region, abdomen, womb, bowels, interior, [...]" (Wisdom 1950: 536) and notably *ajmornak'*, "midwife" (Hull 2005: 3). The word is attributed to *Ix Tz'akbu Ajaw* and the meanings of *nak'* suggest that she is described as pregnant (although pregnancy is described by different sets of words). The associated date 9.9.13.0.17 is more than nine years before the birth of *K'inich Kan Bahlam* II on 9.10.2.6.6, the oldest son to become king (Martin and Grube 2000: 168). Guenter (2007: 52) relates to marriage because of the *chum-il-Ø=iy ta ho' yaj* as "seating as queen" in the next phrase (PAL TI-W, R8-Q9) that leads over to her death. I see little evi-

Only a few synharmonic roots indicate the suffix by a disharmonic spelling (Figure 91) with **CV_1-CV_1=lV_2 / CV_1C-CV_1=lV_2** for CV_1C-V_1l forms. These cases classify as 1.a.ii schemes. With one exception, =**la** is used in these instances.

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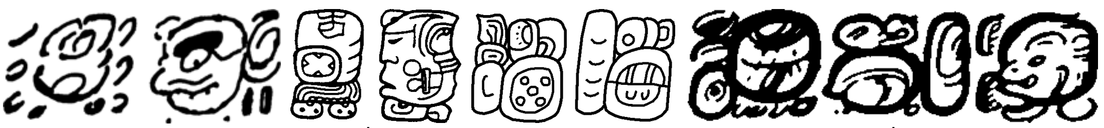
dence for this, and the interpretation has to rely more on the meaning of the 'five *yaj*' that were seated as/with/into. The word can take a considerable range of meanings, cf. CHL *yaj*, "trampa", "rendija", "hermano" (Aulie and de Aulie 1978: 121), CHN *yah*, "pain, sickness, love, anger, suffering" (Knowles 1984-88), CHR *yah*, "sore, sore spot, soreness, poison, poisoning, complaint, disease" (Wisdom 1950: 764). If the pregnancy interpretation holds true, seating expression may possibly refer to a birth complication that resulted in a dead born, as the CHN and CHR lexical evidence suggests.

[753] Previous authors (Chase, Grube and Chase 1991: 6-7) analysed the first part as **u=2=su-lu** < *u-cha' sul*. In mere speculation, I suggest that the two dots may be an aberrant rendering of the doubler, therefore an attributive form of *sus*, "a peeling off, a paring down" (Wisdom 1950: 642) that relates to *mes*, "a cleaning" (Wisdom 1950: 527a). If it would be the second *sul*, no reference to the first is made in the narrative, in contrast to other examples (e.g. the subsequent *chum+tun* events on PAL TS).

[754] The exact meaning of *taj(-al) mo'* is not secure. As it appears in several sites and at different times, Lacadena (2011: 240) considers it to be a generic term for captives rather than a personal name. Note that *taj* is not only torch, but also any bosky vegetation, cf. CHR *tah*, "forest, wooded area", and specifically *tah te'*, "pine tree (generic), any forest tree, pine torch" (Wisdom 1950: 659). The expression *tajal mo'* might therefore relate to a "forest macaw", considering that most macaws prefer tropical forests as their habitat. Another interpretation grounds on the transitive verb *taj*, "to strike", epigraphically known from the agentive form *taj-om* in the name of several Calakmul kings (cf. Martin 1997: 860), e.g. **TAJ-jo=ma u=K'AB=K'AK'** < *taj-om-Ø u-k'ab k'a[h]k'*, "a striker is the hand of the fire" (K6751, J5b-I6). In this case, *taj-al* would be a participle and the expression not account to the showcase. An interpretation of "striking macaw" might be an allusion to a captive as difficult to strike and catch like a bird. Also see the connection of *k'inich taj way-ib* with GIII (Stuart 2005b: 176) and similarly *chak taj-al way* (Figure 90t) as the name of an Oxpemul ruler (Grube 2008: 206). In Yaxchilan, there is a female called **IX ta-ja=la TUN**^{ni} < *ix taj-al tun* (YAX Lnt. 23, J2-K1a). These contexts rather seem to suggest an attribution of the nominal meaning with *mo'*. But as the transitive is homophonous, it cannot be excluded with certainty, and possible both meanings converge. Mora-Marín (2010a: 133-134) considers the cases with a syllabic **ta-ja** spelling as evidence for suffix consonant deletion related to his 'affixation conventionalization hypothesis'. Hereby, he neglects the cases with a morphographic **TAJ** spelling (Figure 92d) or a complete underspelling (Figure 97g) that cannot provide the suffix vowel.

[755] Boot (2009b: 174) itemises *tzihil* as "fresh(?)", although the root class is not secure. The pCh reconstruction is **tzih*, "crudo // raw" (Kaufman and Norman 1984: 133), CHR provides *tzih*, "rawness, crudeness, newness" and the adjective *tzihtzih*, "raw, crude, new, uncooked" (Wisdom 1950: 728-729), CHL has *tsij*, "crudo" (Aulie and de Aulie 1978: 97), and CHN *tzijib*, "nuevo" (Keller and Luciano 1997: 257). For pTz, Kaufman (1972: 97) reconstructed **¢eh: ¢eh-el*, "crudo, verde". Based on this evidence, the ClM root can be considered as *tzih* and adjectival, with $-V_1l$ added in attributive function, possibly as a facultative suffix. Suffixation with =**lV** is found with these expressions following in a clause: *ch'ok* (K4550), *kelem* (K4477), *(te'el) kakaw* (K578, K1728, K4542, K4988, COL Berlin IV Ca 44347), and none in a truncated PSS (K4684). A total of 8 samples provide the suffix, the remaining 48 simply spell **tzi-hi** or just **tzi** with *kakaw* following in many instances (Figures 93e, 97h). The contexts are functionally equivalent, and the epigraphic evidence suggests that these forms are more the result of underspellings in a highly formulaic context than being orthographically distinctive for an optional $-V_1l$ suffix. – In connection with terms referring to adolescent persons (Houston 2009), *tzih* may refer to a specific age at the lower range and after childhood. The relation to *kakaw* has been widely discussed by several authors (Beliaev, Davletshin and Tokovinine 2009: 257, Grube 1990b: 326), but without necessarily providing implications for the recipe (e.g. the use of the beans after fermentation but before roasting).

[756] It is part of the name of a *way* (Grube and Nahm 1994: 707) and another instance of death attributed with a certain characteristic (see footnote 745). While from the Ch'olan languages only CHL provides the adverb *xinil*, "en medio" (Aulie and de Aulie 1978: 115), Grube and Nahm already not the stronger evidence from Tzeltalan. For pTz, Kaufman (1972: 117) reconstructed **šihn: šihn-al*, "rancio", related to TZE *xihinal*, "hedor" (Ara 1986: f. 123r), *xihinil*, "olor desagradable" (Slocum and Gerdel 1971: 202) and TZO *šin ~ šinal*, "rancid, smelly (body odor), […]" and *šinal*, "rancidness, body odor" (Laughlin 1975: 322). The evidence suggests the ClM adjectival root *xin*, "stinking" rather than a substantival "stench", as other authors assume (Boot 2009b: 203, Sheseña 2010: 14). These attributed death *way* figures contrast others without an overt =**lV** marking, such as *sitz' winik ~ cham* (e.g. K2286, C1-C2 [Grube and Nahm 1994: 709-710]).



a b c d

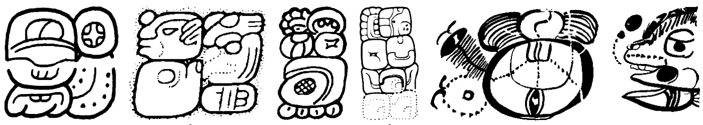
Figure 91: Examples of attributive nominal suffixes with integrative disharmonic spellings. **a) chi-ji=la CHAN^{nu}** (COL K2572, E2-F1), **b) K'IN-ni-chi=la AJAW** (QRG St. F, D17b-C18a), **c) ti pi-bi=le ti-i** (COL K1250, A3-A4), **d) ti tzi-ji=la TE'=le ka-ka-wa** (MTL K1728, I1-K1).

A restricted set of samples uses a morphograph to overspell the suffix (Figure 92) with a morphographic root to provide a full phonemic spelling. Hereby, the onset of the second sign mirrors the coda of the root morphograph: $\mathbf{C_1V_1C_2{=}C_2V_1l}$ for a $C_1V_1C_2$-V_1l form. All cases except two concern the roots *chan* and *k'uh*[757] (see footnote 565).

a b c d

Figure 92: Examples of attributive nominals with integrative morphophonemic spellings. **a) CHAN^{na}=NAL K'UH** (CPN St. B, A10), **b) K'UH=HUL SEIBAL AJAW** (SBL St. 8, C2), **c) K'UH=JUL^{lu} KIP AJAW^{wa}** (CPN Alt. U, U3-V3), **d) TAJ=AL^{la} CHAN^{na} K'IN^{ni}** (TIK Hombre, C2-D2)[758].

Underspellings that still provide the suffix vowel (Figure 93) appear in two different types, although both are classified as scheme 1.g.i. The majority provides a root synharmonic spelling of the form $\mathbf{CV_1\text{-}CV_1{=}Ø}$ / $\mathbf{CV_1C\text{-}CV_1{=}Ø}$ for a CV_1C-$V_1[l]$ form. Only one example (Figure 93c) is a morphographic root with $\mathbf{CV_1'{=}V_1}$, almost as a truncated 1.e.i scheme (see Figure 90m).



a b c d e

Figure 93: Examples of attributive nominals with underspellings. **a) CHAN-na K'UH** (PAL TI-W, J10)[759], **b) IX k'a-ba XOK^{ki}** (YAX Lnt. 28, X2), **c) K'UH=u KAJ^{ji} AJAW** (DCB St. 2, L1b), **d) K'UH-hu SEIBAL AJAW** (ANL P. 1, B3), **e) ta tzi-hi ka-wa** (AGT IDAEH Ceramoteca 805.284, pD1-pE1).

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[757] The suffixation frequently testifies the loss of the orthographic distinction between /h/ and /j/ by the use of **JUL** (Figure 92c) instead of **HUL** (Figure 92b). From the 9 samples, 4 originate from Copan alone, 2 from Nim Li Punit, and singular attestations from Piedras Negras, Sacul, and Caracol, all close to 9.15.0.0.0 and later.

[758] In addition to the examples provided in footnote 754, the epigraphic record provides several names following the format *taj(-al) chan NOUN* with varying spelling patterns for *taj*. *Tajal Chan K'inich* is attested as an epithet for *Yax Nun Ahin* I on TIK Hombre and as the personal name of a king in Tres Islas (**TAJ=AL CHAN K'INICH**, TRS St. 1, B5-A6 [Tomasic, Quintanilla and Barrios 2005: fig. 5]). Without suffixation, we find the spelling **TAJ CHAN^{na} AK** (CNC P. 1, M4, O9, CNC P. 3, C4) ~ **TAJ CHAN^{na} ^{a}AK** (CNC P. 2, A4) ~ **TAJ^{ja} CHAN a-ku** (CNC BcM 2, C3-D4). Especially the last spelling with the phonemic complementation imposes the name of the Cancuen ruler to be simply *Taj Chan A[h]k*, as an alternative to the reading by Lacadena (2011).

[759] This is an example from the couplet spelling *chan-al k'uh kab-al k'uh* (MacLeod 1991: 10, Schele 1992: 127) that in Late Classic texts usually appear with the $-V_1l$ suffix, hence this case is considered as a clear underspelling. As a stand-alone expression, three examples originate from Post-Classic Yucatan, relating to supernatural actors engaged in dedication ceremonies; also interpreted as *chan[-al] k'uh* by Prager (2013: 514-515, tab. 78), or *kan[-al] k'uh* by Boot (2005a: 297-299) with a Yukatekan pronunciation. As for the different context, it is to question if these examples have to understood as **CHAN^{na} K'UH** (as assumed here) or as an underspelled **CHAN-na K'UH**. Overall, 1.g.i schemes are not overly frequent in Early Post-Classic Yucatan (see Chapter 3.3.6.2), and in Colonial YUK (cf. Smailus 1989: 126), the attributive suffix is optional. It seems more likely to consider a sim-

One somewhat problematic case (Figure 94) suggests an integrative spelling of a *–Vl* suffix not harmonic to the root vowel. The question whether the sample in question supports *lum-il* or *lum-[u]l* has implications beyond, even to the extent of the sampling for this showcase.

The litmus test is how to deal with the *a[h]k-Vl* case in this connection which deliberately has been excluded from the sampling. It is often spelled **a-ku=la** (e.g. PAL 96G, I6) ~ **AK=la** (e.g. PAL T19B-W, C2) in the first or second position of a tripartite name phrase of anthroponyms or toponyms[760]. The suffix has previously been considered as (1) adjectival[761], (2) locative[762], (3) an 'animal suffix'[763].

In case of the first interpretation, the **=la** would be synharmonic to the root vowel, only the root spelling would regularly be disharmonic, either imposing a disharmonic *–ul* suffix or an underspelled *–[a]l* suffix. If the mentioned spellings for *a[h]k* were attributive, this lexeme would constantly deviate from the majority of $\mathbf{CV_1\text{-}CV_1{=}lV_1}$ spellings proven to be statistically significant (by the sampling premises). But the spelling scheme figures and even more the harmonic suffixation pattern for the showcase justify the refusal of **a-ku=la** ~ **AK=la** to be adjectival.

ple nominal compound *chan+k'u'*, "sky-god" for these cases, also in comparison with the deliberate *k'u'-ul* spellings (Figure 90m) significant for Yucatan (see Figure 98). In contrast, the Early Classic **CHAN K'UH** and **KAB K'UH** spellings (Figure 97d-e) found in several inscriptions qualify as 2.g.ii underspellings, as they have equivalent full substitutions (e.g. **CHAN-na=la K'UH KAB K'UH**, COL Yax Wayib, A6-D1).

760 It is always *a[h]k* without overt suffixation when it appears as the final constituent in any name phrase, regardless its complexity (cf. Colas 2004: 82). In the other positions, it may appear underspelled when compared to functional equivalent substitutions, e.g. compare with **K'INICH AK MO' NAB** on PAL T19B-W, G8.

761 In this context, Houston, Robertson and Stuart (2001b: tab. 9) claim a putative morphosyllable ****LA** in the toponym **YAX a-ku=la HA'** (CAY Alt. 4, J'3-I'4) to refer to an adjectival *a[h]k-[a]l*, "turtle-y".

762 See Colas (2004: 84-85, 87) for tripartite names with an animal name in first or second position. He assumes that the second-position animal name together with the first part in the name (often a colour adjective) functions to qualify the third part (another animal name or object). For instance, Colas translates *Ahkul Mo' Nahb* as "Schildkrötenort(?)-Papagei-artige Wasserlilie" ('Turtle-Place(?)-Macaw-like Waterlily'), interpreting the **=la** suffix as a locative (2004: 231-232), as it is common along emblems glyphs. Other authors support a similar interpretation, specifically backing up their line of evidence with graphematic arguments. Houston, Robertson and Stuart (2001b: fn. 12) claim the ****AL** morphosyllable to denote a locative *–al* suffix, although without specifically referring to *a[h]k*. Lacadena and Wichmann (2005b: 21-28) in length discuss their ***–u'ul* toponymic or patronymic marker. Because of the frequent **=la** ~ **Cu=la** suffixation patterns, applying their harmony rule 3b (Lacadena and Wichmann 2004: 111), it is supposed to graphematically and thus phonetically contrast with ~ *–ul* < **=lu** for the attributive and ~ ***–uul* < **=li** possessive allomorph. In the light of the constant suffixation patterns quantified for the showcases (Table 73), this study supports that different syllabograms are used in suprasegmental graphematics to distinguish homophonous suffixes in writing. But to develop this principle into a rule that not only signals, but rather reconstructs a different vocalisation of the suffix appears to be an attempt of 'over-reconstruction' (see footnote 35). This appears to be a methodological problem by 'cherry-picking' supportive examples rather than clear line of evidence for the existence of complex vowels in ClM. As the above three examples are allomorphs, a consequent application of the suffixation pattern harmony rules with the root vowel must result in suffixes with different complex vowels. As the vowel quantity is considered to functionally distinguish suffixes on the phonemic level, the whole argument breaks down (see footnote 311 for analogue case). At least the suffix domain is not applicable to whatever disharmony indicates.

763 Boot (2009b: fn. 15) assumes certain animal names to be *CVCul* in the Early Classic that were later shortened to regular *CVC* roots, e.g. *batz'* < **ba-tz'u**. But orthographically, the original morphological shape was retained by **CV-Cu** spellings that occasionally became synharmonic in the Late Classic. This reminds of the *–Vm* 'animal suffix' proposed by Fox (1978: 163) among lexicalised animal names, e.g. *ba[h]lam* < **ba-la-ma**.

No cases of ****a-ka=la** are known, thus suggesting an integrative spelling with an *–ul* suffix. But unclear integrative spellings have been pointed out in connection with *pitz* (see footnotes 611 and 764), and there may be an orthographic rule to retain the original harmony pattern, even this results in a non-integrative spelling (see Chapter 4.1.4). In addition to the two remaining interpretations, I would like to add two other tentative options for consideration: the suffix is an abstraction, or the same nominaliser that appears in words like *pitzil* or *sajal*, leaving a *–Vl* or *–al* suffix for discussion.

The discussion of these cases leaves the example in Figure 94 dubious. It is included because of a functional parallel in the text, but its spelling completely deviates from other cases. If one compares to the CHN *–al* ~ *–il* attributive pattern, the example could also be interpreted in favour of a WCh vernacular spelling (unfortunately, the provenance is unknown).

a

Figure 94: Examples of attributive nominals with integrative harmonic spellings of *–Vl* suffixes. a) lu-mi=li pi-tzi=la (COL K7749, B1-C1)[764].

In case the root is simply realised by a morphograph without any phonemic complementation (Figure 95), most samples are suffixed with a syllabogram that mirrors the root vowel. These 2.e.i schemes require a harmonic suffix vowel has to be reconstructed: **CV_1C=lV_1** for a CV_1C-$[V_1]l$ form. Several examples have spelling group 1 substitutions (partly in parallel contexts) that support the vocalisation (e.g. compare Figure 95a with 92a).

[764] Compare to the expression in Figure 90g that follows later in the dedicatory text of the vessel (cf. Zender 2001). Both are likewise realised by a full syllabic spelling. The assessment regarding a full phonemic or only a vowel suggesting spelling in both cases is connected to the interpretation of **pi-tzi=la**. Houston, Robertson and Stuart (2001b: 36) cite this case of a nominalisation to form an orthographic and functional minimal pair with **pi-tzi=li** as the participial derivation (see footnote 744). The question remains if the **=la** suffix is indication of an *–[a]l* suffix, or disharmonically spells an *–il* suffix that may be an allomorph of a *–Vl* suffix. Compare to spellings for the subordinate **sa-ja=la** < *saj-al* title. The choice throughout the text of K7749 to either use vowel-providing or just vowel-indicating spellings that retain their root harmony pattern may provide an answer regarding the suffix vocalisation of the sample in question. The spelling for *kab-al* necessarily cannot provide a clue as *kab* is always synharmonic. To my knowledge, no ****pi-tza=la** spelling is known, and as the statistical analyses in Chapter 3.3.3 show, syllabic spellings do not tend to adhere to spelling group 2. But **pi-tzi** has been proven problematic in other instances (see footnote 611). While Boot (2009b: 125) provides **lu-ma** as the spelling for *lum*, "earth, soil" (which would support the change to **lu-mi** as integrative), there is also an example of **lu-mi** on CNC P. 1, K5b. This example clearly evidences that the spelling scheme attribution is sometimes far from being clear, as also evaluated in Chapter 3.3.1.

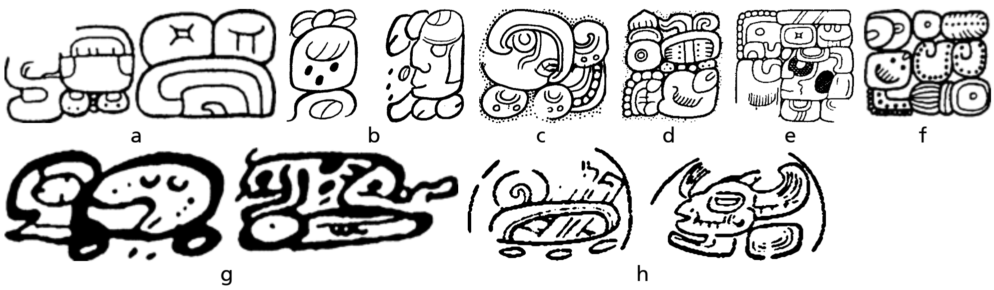


Figure 95: Examples of attributive nominals with morphographic roots and synharmonic spellings. **a)** SQUARE-NOSED.BEAST **CHAN=la AJAW** (QRG Alt. P', S1), **b)** ^{hi}**HIX=li** ^{a}**AJAW** (CML U. 26 Sp. 3, A1-A2), **c) KAB=la K'UH** (CPN St. B, A12), **d) ti K'AK'=la ju-lu** (YAX Lnt. 24, D1), **e) K'UH=lu 5=KAB AJAW**^{wa} (IXZ St. 4, B4), **f) u=K'U'=lu o-to-ti** (CHN ADZ-LF, E2), **g) K'IN=TAN=la ?-la-bu?** (COL K531, F1-G1)[765], **h) SA'=la ka-wa** (TIK MT. 3, B1-C1)[766].

Only three samples with a morphographic root spelling are actually suffixed by a =**la** sign disharmonic to the root vowel (Figure 96), classifying as scheme 2.e.ii. The use of =**la** is therefore consistent with group 1 samples (Figure 91) and substitution patterns (compare Figure 96a with 90e and 91a) prove the suffix vowel to be reconstructed as root harmonic.

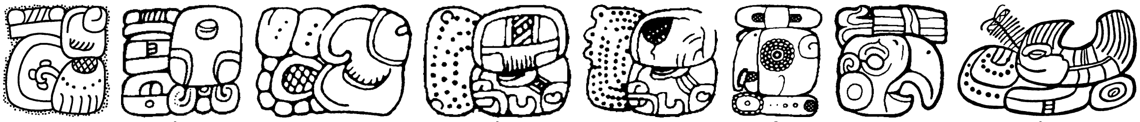
Figure 96: Examples of attributive nominals with morphographic roots and disharmonic spellings. **a)** ^{chi}**CHIJ=la CHAN**^{nu} (COL K531, I1-J1)[767], **b) IX K'UH=la EMACH** (PUS St. N, A9-B9).

Underspellings of the suffix vowel can also appear by a partial underspelling of the root or complete absence of the syllabogram indicating the suffix (Figure 97), classified as schemes 2.g.i and 2.g.ii. Although the examples in Figure 97a-c feature a syllabogram for the suffix, they are still unsimilar to those in Figures 93 and 95, as the root is underspelled by one syllabic sign: $\mathbf{CV_1{=}lV_1}$ < $CV_1[C]\text{-}[V_1]l$. The remaining examples apply a 'zero grapheme' with a morphographic root for an anticipated suffix: $\mathbf{CV_1C{=}Ø}$ < $CV_1C[\text{-}V_1l]$. Figure 97g is the outmost abbreviatory spelling with just a syllabogram: $\mathbf{CV_1{=}Ø}$ < $CV_1[C\text{-}V_1l]$.

[765] It is the name of a *way* (Grube and Nahm 1994: 687). This feline creature features a large sun symbol covering the ventral side. Because of the =**la** suffix, *ta[h]n* is to be understood here as "chest" and must be compounded with *k'in*, because otherwise the suffix cannot be explained with the preposition *ta[h]n*, "amidst" that is derived from the noun. The name can be analysed as *k'in+ta[h]n-[a]l bolay?*, "sun-chested feline". See Grube and Nahm (1994: 688) for the rationale to read *bolay* and Helmke and Nielsen (2009: fig. 2) who propose the value **BOL** to the HEADLESS.JAGUAR grapheme AT6. Other attestations similarly spell **K'IN**^{ni} **TAN**^{na} **JAGUAR.BODY-la-bu/yu** (cf. TIK St. 3, C3-D3, YAX Lnt. 47, C3-D3, YAX St. 18, C1-B2, PAL TS, C2-D2), but without a =**la** suffixation of *ta[h]n*. It is either an underspelling, or a different analysis of the name with a stative predicate and a prepositional phrase as *k'in-Ø ta[h]n bolay?*, "it is the sun amidst the feline".

[766] This may not be a true morphographic spelling, but a **CV** syllabogram could be used to underspell a *CV'* root. It is not uncommon that a single syllabogram can spell a lexeme (see footnote 25). Although substitutions with other **sa** signs occur, the sign 32R may primarily serve as the morphograph **SA'**, as recently proposed by Tokovinine (cf. Tokovinine and Fialko 2007: fn. 1).

[767] Five examples of the name of this *way* (see footnote 748) have been sampled, of which three use =**la** instead of =**li**. This proportion should not be overestimated with respect to the discussion of *a[h]k-Vl*, as the group 1 samples comply with the regular $-V_1l$ suffix, as do the other samples outside this nominal phrase.



a b c d e f g h

Figure 97: Examples of attributive nominals with underspellings of the suffix. **a) AJ bu=lu HA'** (OAG Alt. 1, H1), **b) AJ po=lo cha-ya** (YAX St. 18, A5), **c) k'u=lu** (CRC Alt. 12, 23), **d) CHAN K'UH** (TIK St. 31, F25), **e) KAB K'UH** (TIK St. 31, E26), **f) ta MO'**^{o} (MQL Str. 4 Frg. F, 1b)[768], **g) TAJ MO'** (LTI P. 1, G1), **h) ta tzi ka-wa** (UAX Canberra Tripod, B4).

All lexemes attested in attributive function are of a CVC shape. The epigraphic evidence, supported by the strong statistical figures fully supports the morphology and phonology of $CV_1C\text{-}V_1l$ provided by the linguistic evidence. Such forms can regularly be analysed as a canonical bisyllabic form *[CV.CVl], or as a trisyllabic *[ʔu.CV.CVl] in case the attributive nominal is part of a possessive phrase (Figure 90l, r).

More of a concern is the question of the optional suffixation. This showcase imposed several difficulties on the sampling and statistical analysis regarding the proper inclusion of underspellings (Figures 93 and 97) and the exclusion of forms that are not applicable, because they do not feature an attributive suffix. This uncertainty is caused both by the linguistic evidence and by its graphematic implementation. How are cases discerned and is there a way to securely identify an underspelling or the omission of a facultative suffix (see footnote 755)? Parallel statements and substitutions may not necessarily be decisive if the attributive suffix may be used at random.

The only way to approximate this question is the lexicon: which words and lexical classes are applied? It is apparent, that certain adjectives never appear with the $-V_1l$ attributive suffix, this is grammatically attested for colour terms and also evident in the hieroglyphic corpus (see Figure 90t). For other root adjectives, no single case with **=l**$\mathbf{V_1}$ is attested[769] as well. Of the 25 different lexemes attested among the samples (not counting re-adjectivised roots), only *utz* is clearly adjectival, *tzih* and *xin* likely are, the remaining 22 are substantival[770].

[768] This sample and those resembling the example in Figure 97g are classified as a 4.a.iii scheme. With regard to the considerations made in footnotes 754 and 758, *taj ~ taj-al* cannot be excluded despite the functionally equivalent context. This relates to the optionality of attributive suffixes discussed below, also in a regional and diachronic perspective, as with *chan(-al) k'uh* and *kab(-al) k'uh.*

[769] This is apparent with the bisyllabic *lakam*, "big" that frequently is spelled **LAKAM**^{ma} to reinforce the final consonant, the space is never used to spell a suffix. Other cases like **ch'o-ko** < *ch'ok*, "young" or **pa-ja** < *paj* "sour" may be suggestive for underspellings, but this spelling is exclusive and therefore statistically significant for no suffixation (when compared to the outcome in Chapter 3.3.6.2).

[770] These are (with their frequency): *bih* (1), *bub* (2), *chan* (15), *chih* (2), *chij* (2), *hix* (1), *kab* (14), *kakaw* (1), *k'ab* (6), *k'a[h]k'* (1), *k'in* (1), *k'inich* (2), *k'uh* (54), *lum* (1), *mak* (1), *nak'* (1), *pib* (1), *pop* (4), *sa'* (2), *sus* (1), *taj* (22), *ta[h]n* (1), *tzih* (56), *utz* (1), *xin* (1).

From the three categories taken from the literature in Chapter 3.1.2.2, only the second category has strong support for a nominal attributive *–V_1l* suffix: nouns as adjectives. In comparison to root adjectives which indeed barely appear with a suffix, this is support that substantives remain in their class, but express a semantically restricted quality of the term they modify. The assumption made of an "attributive relationship" (Tozzer 1921: 38) proves true when contextually analysing the relations. Even more, the general sense of a non-intrinsic property as explained by the *k'a[h]k'-al jul* paradigm (see footnote 285): a torch needs to be lit to burn[771].

If the argument is reversed, then indeed most other adjectives have to be used for intrinsic qualities (see footnote 286), and appear without any *–V_1l* suffix. The intrinsic quality in this sense must be understood as in two ways: (1) an invariable characteristic, such as the taste of a lemon is always sour; and (2) a feature that can take different parameters, such as a person being slim or tall, but the person always has body dimensions. Otherwise, adjectives receive a *–V_1l* suffix[772], and some may always require one, as their quality would always be non-intrinsic, such as 'good' or 'bad'.

Chapter 3.1.2.2 also invoked the possibility that the intrinsic quality may be subject to conceptual change, either on a regional basis or by a historical development. One object of investigation is the deliberate attributive indication of the grapheme AMC as **K'UH** (Figure 98) and its implications (see footnote 287). All syllabic and morphophonemic complementations of the root are indeed of attributive function, but this does not yet mean that their absence does not indicate one[773]. The distribution must distinguish between emblem glyphs, titles and other references.

[771] The same is true for other cases, to recapitulate some: *bih-il cham* – it is a non-intrinsic feature to the inevitable death that it may appear on the 'cross-roads'; *k'in+ta[h]n-al ba[h]lam* – a 'sun-chest' is a non-intrinsic characteristic of a jaguar when appearing as a *way* figure; *bub-ul ha'* – it is a non-intrinsic feature of water to be crowded by tadpoles even when a specific body of water becomes a habitat.

[772] To further work out and confirm these patterns would be interesting from a cognitive point of view, as it would reveal an emic perception of the physical and metaphysical world. But if non-intrinsic qualities require a suffix, how would this e.g. explain the proclaimed constant use of *tzih-il*? Footnote 755 assumes that this description refers to a specific state of the cacao fruit or bean in the processing that was possibly not considered the natural state, as some treatment already altered it. But maybe it was particularly because the cacao was raw and unprocessed. This would also answer the question for *tzih* in favour of underspellings, as the non-intrinsic quality would not randomly shift in a formulaic dedicatory phrase, but be abbreviated. In reference back to footnote 732 and the question whether *te'-el* could be attributive, the answer must be negative under this semantic paradigm: the tree is necessarily an intrinsic part to enable the growth of the cacao fruit.

[773] In relation to emblem glyphs, Prager (2013: 27) considers an 'adjectival' function in connection with regular underspellings. In his view, the prefix of an emblem glyph needs to be understood as **K'UH** < *k'uh[-ul]*; which would be a 2.g.ii spelling scheme in this study. But his investigation of the *k'uh* concept in Classic Maya religion specifically excludes emblem glyphs. As this study is not concerned with socio-political or religious aspects, a full discussion must be refused. But it is of course acknowledged that cognitive perceptions have impact on the spoken language that may find reflection in certain graphematic practices. To embrace both demands, the discussion of *k'uh-ul* forms is meant as a brief excursus.

Emblem glyphs in the paradigmatic *k'uh(ul)*+emblem+*ajaw* format (cf. Gronemeyer [2012], Tokovinine [2008: 162-227, 2011] for recent discussion on the socio-politics) only comprise 14 secure cases. Two faint hot spots indicate a very restricted regional and temporal phenomenon[774]. The evidence is not decisive to favour (1) the interpretation of a changed divinity concept for a ruler (as theorised in footnote 287) or (2) consider a regular underspelling in a frequent epithet, although there is a tendency towards the second alternative[775].

The situation is different with titles from Early Post-Classic Yucatan that comprise 27 examples[776]. None of these titles actually appears with an underspelling, but it is difficult to use them as support for the case of emblem glyphs. The consideration of some of these titles as patronyms (Grube 1994b: 327-328) or emblem glyphs (Boot 2005a: 299-302) was abolished in favour of personal titles of office, reflecting the socio-political organisation of Chichen Itza (cf. Voß and Kremer 2000: 151-156, 165, 170-171).

In the remainder of cases, *k'uh-ul* qualifies the noun(s) to follow. These can be classified as (1) conjurations[777], (2) objects[778], and (3) animals[779]. Four samples remain unclear, as the context is eroded. All these cases are Late Classic and do not appear before 9.12.

[774] Singular cases appear in Chiapas (CKL Mon. 22 – *K'atun* interval 9.6), Central Peten (NAR Alt. 1 – 9.8) and Usumacinta (DCB St. 2 – 9.14), and two from the Mopan-Pusilha area (SCU St. 9 – 9.18; CRC St. 17 – 10.1). Three samples from the Motagua region all date to the reign of *Yax Pahsaj Chan Yopat* (CPN Alt. T – 9.17, Alt. U, T. 22a Stone – 9.18). Six samples come from the Pasion region, an early one (CRO St. 1 – 9.13) and five late from the Seibal area (SBL St. 11 – 10.0, ANL P. 1, SBL St. 8, St. 9 – 10.1). Prager's (2013: 27) assumption that suffixation in emblem glyphs regularly occurs from *K'atun* interval 9.15 on is certainly not true.

[775] The clustering in Copan and Seibal may simply be a scribal preference, as contemporary examples from the same or other monuments do not explicitly write out the suffix. Compare for example on CPN Alt. U **K'UH KIP AJAW** in D4 with **K'UH=JUL^{lu} KIP AJAW** in U3-V3. When comparing the ratio between regular and defective spellings in formulaic expressions, the percentage of underspellings is not uniformly pointing to one direction: 85.7% for 1ATTR *tzih(-il)*, 16.8% for 1POSS *te'(-el)*, and 6.8% for 3INSTR *(y-)uk'(-ib)*. As no samples of emblem glyphs with a simple **K'UH** spelling have been sampled, no proportion can be given. If these cases account as underspellings (as implied by the functional equivalency of the suffixed cases), then the cardinality of spelling scheme 2.g.ii would certainly increase into the hundreds among showcase 1ATTR. It would also heavily affect the distribution of schemes across all showcases (Figure 19).

[776] Some of these epithets are: **K'U'=lu AJAW^{wa} K'U'=lu a tz'u-le ^{wa}WAJ** < *k'u'-[u]l ajaw k'u'-[u]l a[j] tz'ul waj*, "Divine Lord, Divine He of the Foreign Bread" (CHN MON-L5, C1b-D2), **K'U'=lu AJ k'a-k'a** < *k'u'-[u]l aj k'a[h]k'*, "Divine He of Fire" (CHN MON-L4, Z4), or **K'U'=lu ko-ko-ma ya=ja-wa=la ch'o-ko** < *k'u'-[u]l kokom y-ajaw-al ch'ok*, "Divine Guardian, Lord of the Young" (CHN CC-HB, 57).

[777] For example: **AJ K'AK'=o=CHAK^{ki} u=K'UH-hu=lu TZAK ^{ya}YAXUN=BALAM** < *aj k'a[h]k'-o[']-cha[h]k-Ø yaxun ba[h]lam*, "*Aj K'ahk'-O'-Chahk* is the holy conjuration of *Yaxun Bahlam* IV" (YAX Lnt. 42, E2-E4).

[778] For example: **ya=k'a=wa u=K'UH-hu=lu PIK** < *y-ak'-a-Ø u-k'uh-ul pik*, "he gave his divine bundles" (PAL TI-M, I4-I5).

[779] The only example is **IX K'UH=la EMACH** < *ix k'uh-[u]l e[h]mach*, "Lady Divine Racoon" (PUS St. N, A9-B9). I follow Prager's (2002a: 146) observation that this represents a female title that may have been followed by an *ajaw* spelling, thus serving as an emblem glyph.

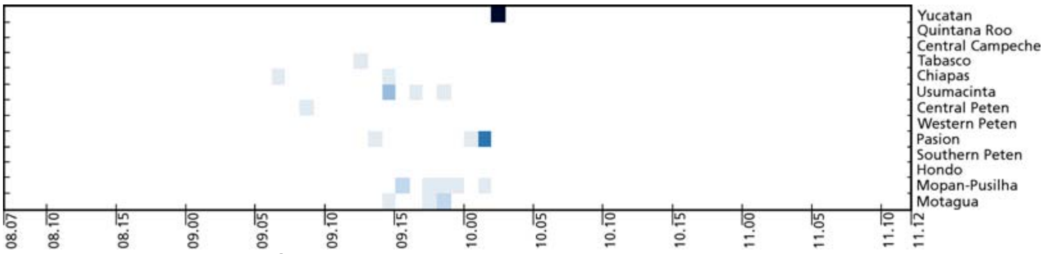


Figure 98: Heatmap of *k'uh-ul* spellings in diachronic and spatial distribution with N_S :=|54|. Sven Gronemeyer.

In sum, showcase 1ATTR was difficult to handle based on the state of research published so far in the literature. The sampling under certain circumstances faced the problem to decide whether a spelling was an underspelling or a deliberate omission of the suffix. It also had to carefully exclude other nominal –*Vl* suffixes that influenced the perception of attributives in the past (see footnotes 743 and 762).

But it was possible to narrow down the derivational paradigms and semantics during the discussion. Although the problems in relation to the sampling might impact the data quality in relation to completeness and correctness, the data nevertheless are able to provide orthographic patterns to securely identify attributive suffixation (Table 80). The analysis of the spelling patterns confirms the linguistic data, possibly even with the identification of vernacular forms (Table 35).

Type	Transcribed Paradigm	Canonical Spelling
-ATTR	$CV_1C\text{-}V_1l$	**$CV_1\text{-}CV_1\text{=}lV_1$ / $CV_1C\text{-}CV_1\text{=}lV_1$ / $CV_1\text{'=}V_1\text{-}lV_1$**
CVC		**$CV_1\text{-}CV_1\text{=}lV_2$ / $CV_1C\text{-}CV_1\text{=}lV_2$**
NOUN,ADJ		**$C_1V_1C_2\text{=}C_2V_1l$**
	$CV_1C\text{-}V_1[l]$	**$CV_1\text{-}CV_1$ / $CV_1C\text{-}CV_1$ / $CV_1\text{'=}V_1$**
	$CV_1C\text{-}[V_1]l$	**$CV_1C\text{=}lV_1$ / $CV_1C\text{=}lV_2$**
	$CV_1[C]\text{-}[V_1]l$	**$CV_1\text{=}lV_1$**
	$CV_1C\text{-}[V_1l]$	**CV_1C**
	$CV_1[C\text{-}V_1l]$	**CV_1**
	$CV_1C\text{-}il$	**$CV_1\text{-Ci=li}$**

Table 80: Morphological paradigms and canonical spellings of attributive nouns and adjectives.

4.1.8 – Root Transitive Marker –V_1 and Non-CVC Transitive –*V* Marker

There are two important questions to purse when discussing transitive markers: (1) how can the epigraphic evidence be utilised to support a –V_1 / __# vocalisation opposite to –V_1w, and (2) how can cases of underspellings be distinguished from nominal forms? Despite clear results from the statistical analyses regarding the spelling patterns (Chapter 3.3.3.3.1 and Table 73), the answer to this question has more to rely on the linguistic implications (Chapter 3.1.3.1). However, with respect to the objectives of this study, the foremost question is to investigate the spelling patterns at the morphemic boundary.

Leaving the discussion regarding the presence of the final glide apart, the set of spelling group 1 samples clearly provides evidence for a suffix vowel harmonic to the root vowel. As Chapter 3.3.6.3 demonstrated, the amount of CaC roots in the corpus is significant among transitive verbs. To achieve an integration of the synharmonic suffix vowel with these (Figure 99), the second root syllable (or the phonemic complement of a morphographic root spelling) has to be a **Ca** sign. As a 1.a.i scheme, the root spelling remains unaltered with a synharmonic root: **Ca-Ca / CaC**$^{\mathbf{Ca}}$ > **u/ya=Ca-Ca=wa / u/ya=CaC-Ca=wa** for a *u-CaC-a ~ y-aC-a* form. Roots with a disharmonic pattern consequently change their spelling: **Ca-CV / CaC**$^{\mathbf{CV}}$ > **u/ya=Ca-Ca=wa / u/ya=CaC-Ca=wa** in a 1.d.i scheme for a *u-CaC-a ~ y-aC-a* form[780].

Several 'vowel initial' ʔVC roots behave as normal CVC roots (Figure 99a-c) and do not show a different *–V* suffixation typical for non-CVC and derived transitives. The corresponding roots, *ak'* and *al*, are also not reconstructed as a VC-V form in pCh.

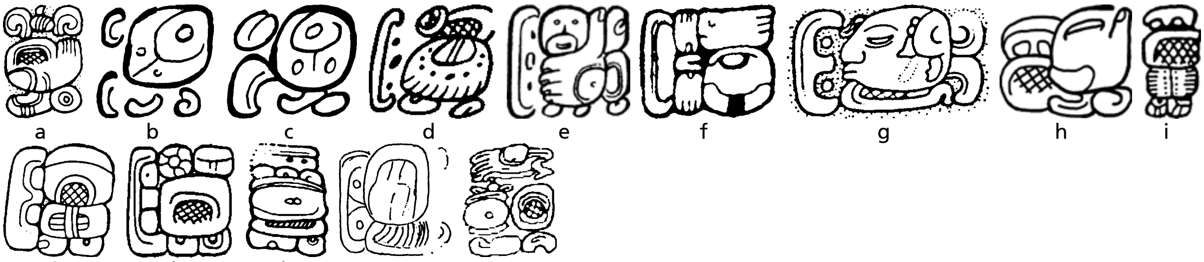


Figure 99: Examples of root transitives with integrative CaC roots. **a) ya=k'a=wa** (CRC St. 3, D13b), **b) ya=la=wa** (COL K671, T4), **c) wa=la=wa** (MTL K793, F4)[781], **d) u=ch'a-ba=wa** (CPN K4655, C1), **e) u=CH'AM-ma=wa** (PAL T19B-S, P3), **f) u=ma-ka=wa** (MQL St. 5, A3)[782], **g) u=na-ka=wa** (DPL HS. 2 E II, C1), **h) u=pa-k'a=wa** (COL K8457, O2)[783], **i) u=pa-sa=wa** (HLK Lnt. 1, G7), **j) u=pa-ta=wa** (CRC St. 17, A2), **k) u=ta-pa=wa** (COL Lnt. 3 Site R, B2)[784], **l) u=tz'a-ka=wa** (COL St. New York, F1a), **m) u=TZ'AK-ka=wa** (CLK St. 9, pQ6), **n) u=tz'a-pa=wa** (PRU St. 34, G3b).

With any other CVC root (Figure 100), the samples classify as a 1.a.ii or 1.d.ii scheme, depending on the original root harmony pattern. We either find: **CV$_1$-CV$_1$ / CV$_1$C**$^{\mathbf{CV_1}}$ > **u=Ca-Ca=wa / u=CaC-Ca=wa** or **CV$_1$-CV$_2$ / CV$_1$C**$^{\mathbf{CV_2}}$ > **u=Ca-Ca=wa / u=CaC-Ca=wa** for a *u-CV$_1$C-V$_1$* form. No ʔVC is known among these cases, and no disharmonic root is securely identified from other contexts.

[780] Among the 2IND transitive roots, only *tzak* is so far securely attested with a disharmonic **tza-ku** pattern outside a verbal context, see e.g. **u=K'UH-ju=lu tza-ku** on YAX Lnt. 25, E1. The case of *tz'ap* is highly questionable (see footnote 612), as well as how to consider certain spellings of *k'al* (see footnote 810).

[781] The analysis of the two samples with this spelling as *[in]w-al-a-Ø*, "I say it", follows Bíró (2011c: 302). Although the ergative pronoun is underspelled, the context allows the reconstruction as 1SG.ERG only. The use of the **wa**= spelling is also supportive among other pre-vocalic ergative pronouns, arguing against the necessity of morphosyllables (cf. Gronemeyer 2011b: 321-322).

[782] Note the use of the grapheme XH4 as **wa** instead of its polyvalent morphographic value **WAJ**. An overspelling with the morphograph would seem unlikely, so the monument features a very late acrophonic innovation (with 10.0.10.17.5 as the contemporary date).

[783] This example, as others from the Classic lowlands, carries the meaning "to form", and not the Yukatekan meaning "to plant, as attested in the codices (see Figure 103q). The scenery accompanying the verbal expression features a monkey scribe carving a mask.

[784] The reading and analysis of this block as *u-tap-a-Ø* bases on the tentative identification of the sign 2M2 as **ta** by Bíró (2011a: 206). In relation to the verbal expression, the author refers to an individual that "was adorned […] with the *xikb'alel bah* by *Yaxun B'ahlam* IV[…]." Boot (2009b: 163) also translates as "to renew, to repaint". In any case, the transitive inflection of the example makes clear that *Yaxun Bahlam* IV is the actor and the unnamed patient is *Ajk Mo'*, mentioned later in the text. The action is carried out with the object designated as a *xik-bal-el* (cf. Gronemeyer and MacLeod [2010: 28-30] for a discussion as a type of garment).

Especially these CVC roots are, together with their corresponding passive forms (Figure 51), a good case to compare the differing root spellings with regard to the suffix vocalisation. This is even more true in case there are disharmonic root spellings alternating in different diatheses. This clearly indicates a conscious orthographic strategy of utilising the second syllabogram or a phonemic complement to provide an integrative, full phonemic spelling. As such, it also abrogates the necessity of a morphosyllable to "supply one that is appropriate", as Houston, Robertson and Stuart (2001b: 15) rectify their need.

In this respect, it is also interesting to note that among showcase 2IND, no non-integrative syllabic or complemented spellings are recorded. This is in accordance with other root-harmonic suffixes, as investigated for attributives (Chapter 4.1.7), the mediopassive (Chapter 4.1.12), and the perfect (Chapter 4.1.19); but there are two potential examples among the antipassive (Chapter 4.1.10). Although the root transitive suffix vowel can be anticipated by the reader, there is no instance where a disharmonic root pattern is retained. Examples such as those illustrated in Figure 55 for the passive were taken as additional evidence for the existence of morphosyllables. Houston, Robertson and Stuart (2001b: 15) define as their fourth morphosyllabic principle the underspecification of the suffix vowel by suspending disharmony rules. While this avoids all the problems inherent in the proposal made by Lacadena and Wichmann (2005b), it would allow spellings such as ****u=tza-ku=wa**. Their absence in the record (at least among root transitive verbs) is not direct proof, but strong support to refuse morphosyllabic signs. The orthographic mechanisms are the result of the dichotomy between syllabograms and morphographs.

As it was elucidated in connection with passive spellings and with other cases (see footnote 762 for *–Vl* suffixes), the preferred suffixation with =**wa** among non-CaC roots is indication that disharmony cannot apply in this case (see footnote 311) and most probably not at all in the suffix domain, even without the necessity of morphosyllables. With a root-harmonic suffix vowel and a constant suffixation pattern, any harmony model would impose up to three different vowel quantities.

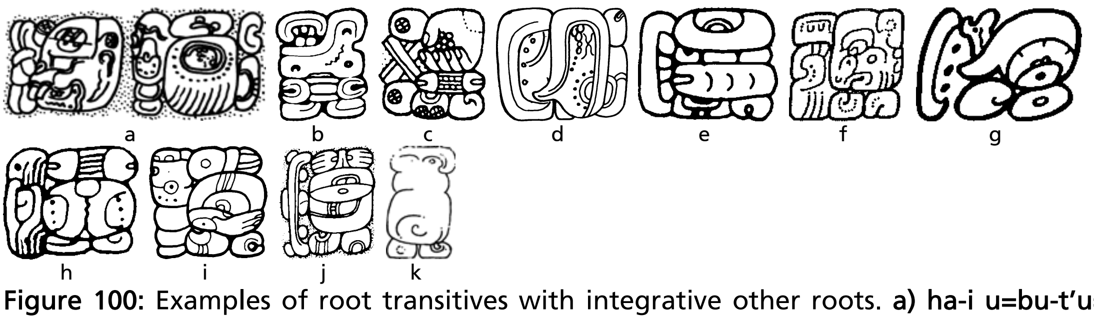


Figure 100: Examples of root transitives with integrative other roots. **a) ha-i u=bu-t'u=wa** (PAL PT, M11-N11)[785], **b) u=cho-ko=wa** (DPL St. 8, I5a), **c) u=CHOK-ko=wa** (SBL St. 10, B3), **d) u=chu-ku=wa** (PAL HDPG, A4), **e) u=je-le=wa** (PAL TFC, E6), **f) u=jo-ch'o=wa** (ITN St. 17, H3a), **g) u=k'e-te=wa** (CPN K4655, G1)[786], **h) u=ko-bo=wa** (PAL TFC, G5), **i) u=ti-mi=wa** (PAL TI-W, A7), **j) u=tzo-lo=wa** (TRT Mon. 6, K11)[787], **k) u=wo-lo=wa** (CPN HS. 1 XII, J1a).

[785] This is the only sampled instance, where an independent pronoun is fronted with an indicative form to topicalise the agent *K'inich Janab Pakal* who follows the verb. This fronting is therefore not restricted to agent-focusing antipassives (Chapter 4.1.11), but also appears with other antipassives (Chapter 4.1.10), the perfect (Chapter 4.1.19), and is also attested with one case of a subjunctive *ha[']-i-Ø x-aj-es-Ø*, "it (is) them who will

Spellings with a simple morphographic root (Figure 101) comprise the highest quantity of samples, either as a 2.e.i scheme with a CaC root or as 2.e.ii with any other CVC root. No root harmony pattern is indicated and thus, most spellings comprise **CV$_1$C** > **u=CV$_1$C=wa** for a *u-CV$_1$C[-V1]* form. Only one instance of a ʔVC root is documented.

If morphosyllables are not needed among syllabic spellings, consistency also makes them unnecessary them with morphographically realised roots. But especially in this constellation, it is even more questionable why morphosyllables should be compulsory. If the concept of the 'regular' ****WA** morphosyllable is applied, it still underspecifies the suffix vowel, as it is not only unwritten but also variable (cf. Houston, Robertson and Stuart 2001b: 15-16), as =**wa** would do. But the concept of a morphosyllable is deliberately designed to provide the suffix consonant, whereas =**wa** would be a simple overspelling if the root transitive marker is indeed *–V$_1$ / __#* only. It has the graphematic function – not the grammatical meaning – to specifically mark morphographic root spellings as a transitive verb form and distinguish them from nominalised forms. We can clearly conclude this function in comparison with underspellings (Figure 103) and such nominalisations (Chapter 4.1.9).

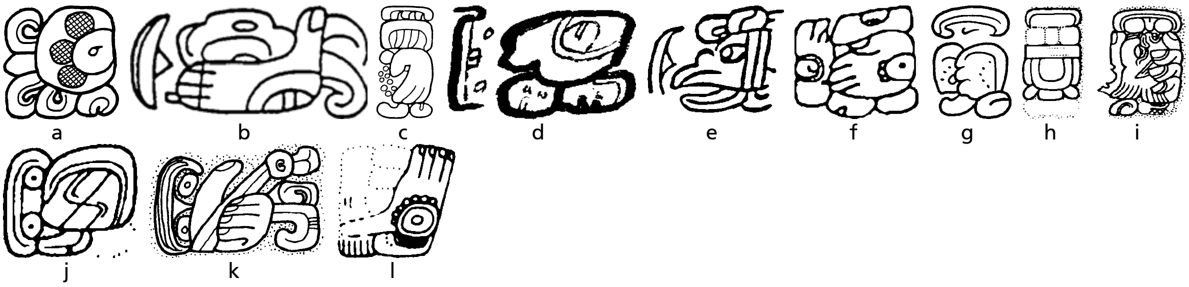


Figure 101: Examples of root transitives with morphographic root spellings. **a) ya=AK'=wa** (PAL TI-W, J9), **b) u=CH'AM=wa** (RAZ Jd. Celt 1, B3), **c) u=^{cho}CHOK=wa** (QRG Alt. O', R2), **d) u=CH'AB=wa** (C Dr. 30c), **e) u=JOY=wa** (COL JM Plaque 4442, A5), **f) u=K'AL=wa** (SBL St. 1, A5), **g) u=KAL=wa** (NAR Mace Head, D5)[788], **h) u=LAM=wa** (MQL St. 2, K5b), **i) u=TZAK=wa** (YAX Lnt. 25, B1a)[789], **j) u=TZ'AK=wa** (NAR St. 23, F21), **k) u=TZUTZ=wa** (TIK St. 39, Bp6), **l) u=FLINT.HAND=wa** (TIK Alt. 7, 2).

awaken it" (TRT Mon. 6, L8-K9). Although the independent pronoun is the third person singular, it refers to a collective of patron deities mentioned in the preceding clause.

786 Proposed translation for *k'et*: "to keep". Compare to CHR *k'ete*, "hold back, keep" (Hull 2005: 73). Boot (2009b: 165) analyses this example with the root *tek'*, "to place" (see Figures 51r and 203j), but it would be unusual for the infix to be read first (see e.g. Figures 54, 55c, 68, 90i, 100d).

787 See Stuart (2008b) for proposing **tzo** to be a candidate for the complex sign in question, here with **lo** infixed, and a preliminary reading *tzol*, "to line-up" based on pCh evidence (cf. Kaufman and Norman 1984: 133). The decipherment proposal was later proven productive by Barbara MacLeod in a different context (see footnote 695).

788 The name of the Naranjo ruler *K'ahk' Ukala Chan Chahk* (M&G:80-81) is good cross-evidence that the sign ZX4 is only read **KAL** and not ****KALOM**, as suggested by different authors (e.g. Coe and Van Stone 2001: 164, Wagner 1995: 1). This makes the sign catalogued as ZX3 only a suffixed spelling **KAL=ma**. An antipassive derivation of *kal* with SS2 on a vessel from Cuychen (see Figure 120f) also imposes the **KAL** reading to this sign (Christophe Helmke, personal communication, February 25, 2011) and broadens the variety of the title's substitution patterns (Stuart, Grube and Schele 1989).

789 This example is one of the prime contexts that relate the verb *tzak* with the rise of a vision. The connection to the iconographic motif of the 'vision serpent' was first established by Proskouriakoff (1973: 169), the decipherment of MZK **TZAK** was later achieved by Nikolai Grube (cf. Schele 1991: 86-90). The patient here is **u=K'AWIL^{wi-la}=li** < *u-k'awil-[i]l*, as a possessed deity (Houston, Robertson and Stuart 2001b: 21). It must be noted that in G1 of the Supplementary Series, **TZAK** and **CH'AM=K'UH** may substitute (Gronemeyer 2006a: 4-

A very limited set of samples does not indicate the transitive verb status by the preferred =**wa** pattern, but uses =**wi** as an alternant. Such cases (Figure 102) have caused some confusion in the past and have occasionally been considered as nominalised antipassive spellings, as =**wi** is its preferred suffixation pattern (see Chapter 4.1.10)[790]. Considering the linguistics foundations, nominal forms of an 'antipassive' meaning are formed by the –Ø nominaliser of a transitive root alone (Chapter 4.1.9) rather than an intermediate intransitivation. However, as the =**wa** pattern is so distinctive for the indicative, it is to question whether these deviations were purposefully made for reasons not understood.


a b c d e f

Figure 102: Examples of root transitives with suffix spellings deviating from the standard pattern. **a) u=CHOK=wi** (NAR Alt. 1, K9), **b) u=CH'AM=wi** (OXP St. 19, C6), **c) u=K'AL=wi TUN^{ni}** (CRC St. 16, B16), **d) u=TZUTZ=wi** (NAR Alt. 1, I10), **e) u=TZ'AK=wi** (NAR Alt. 2, D6), **f) u=tz'a-pa=wi** (NAR St. 36, C1).

The underspelling of the =**wa** suffix (Figure 103) can be differentiated into two different schemes. The suffix vowel is provided with a 1.g.i scheme by **u=CV$_1$-CV$_1$=Ø / u=CV$_1$C-CV$_1$=Ø / u=CV$_1$C=V$_1$** < *u-CV$_1$C-V$_1$*, which still is a full phonemic spelling when assuming –*V$_1$* / __#. A 2.g.ii scheme would require a morphographic root spelling with the suffix to be reconstructed with **u=CV$_1$C=Ø** < *u-CV$_1$C[-V$_1$]*, if no other arguments can be claimed (see footnote 315). Only two cases of a 2.g.i scheme with an underspelled root **u=CV$_1$=wa** < *u-CV$_1$[C-V$_1$]* are known.

Such underspellings are vexing when delimiting them from nominalised forms. Direct evidence would come from harmony alterations, but there are no secure instances in the corpus. The argumentation has to rely on circumstantial evidence: (1) there are direct substitutions[791]; (2) the object is not explicitly mentioned[792]; and (3) despite the absence of =**wa**, the final syllabic sign still enables the pro-

5). This correlation was further elaborated to consider *tzak* and *ch'am* as two aspects of conjuring rites, to manifest and hold *K'awil* (or parts or aspects of the deity) as the result of auto-sacrificial bloodletting (cf. Valencia Rivera and García Barrios [2010] for a full discussion). To what extent *ch'ab* integrates into this semantic field (see footnote 878) is pending further review.

[790] Especially the example in Figure 102a served as a key witness (e.g. Gronemeyer and MacLeod 2010: fig. 3, Stuart 2012b), as *chok+ch'aj* is known from antipassive contexts. Interestingly, of the 13 instances of *chok* among 2ANTIP, only 3 samples use =**wi** (Figure 119a), otherwise it is =**wa** (Figure 120a-b). Depending on the view whether **CH'AJ** is implicitly denoted by the droplets in sign MZS (see footnote 315), the construction was either considered as an absolute or an incorporating nominalised antipassive, the ergative pronoun binding the agent, *Aj Wosal* of Naranjo. The example in Figure 102d binds **u=8=WINIKHAB AJ=wo-sa** (NAR Alt. 1, H11-I11) as its argument(s): If it is a nominalised, stative predicate, the whole sequence would be a possessive phrase as the agent. I find it more reasonable to consider a patient and an agent, as a transitive verb, the whole sentence would translate as "*Aj Wosal* sowed the 8^{th} K'atun."

[791] See Figures 103e-f which originate from the same almanac in the Dresden Codex. Their highly repetitive structure makes an arbitrary change of verbal and nominalised forms unlikely. Also compare between the examples in Figures 102b and 103b. These originate from two different monuments, but these were erected next to each other by the same ruler, and record the same date and event (Grube 2008: 212).

[792] The object would be required to constitute a nominal 'antipassive' of object incorporation. See for example **u=ko-bo** on CRC BcM. 3, D4 that is preceded by the independent pronoun **ha-a / ha=AJ** (see footnote 724) in C4 and directly followed by **u=KAB=ji=ya** in C5. Even if the nominalisation is possible with an oblique patient,

vision of a $–V_1$ / __# or $–V$ / __# suffix[793]. In the end, all examples with a final **CV$_1$** syllabogram are considered in favour of a verbal form, if no other grammatical or contextual reasons argue against it.

As section 2 in Chapter 3.3.6.2 demonstrated the amount of underspellings is only significant for the codices, especially the Dresden Codex alone (see footnote 318). Another considerable group of cases lacking =**wa** are non-CVC and derived transitives (Figure 105). In the codices, most verbal inflection follows the ClM morphology (even with lexical vernaculars), i.e. =**ja** is not regularly used to mark the Yukatekan completive aspect, see Chapter 4.3.4.1. Also, =**wa** almost exclusively appears with a morphographic root, in fact, once with *k'am* and otherwise only with *ch'ab*. Here, it rather seems to act as the visual indicator for a verbal and not a nominal form.

The accumulation of underspellings with syllabically written roots in the codices has several implications. The scribes regularly applied 'reduced' spellings as they re-analysed the Ch'olan morphology in its context as a written vernacular. If so, the codical spellings would indeed support the linguistic reconstruction of just a $–V_1$ indicative status marker in pCh, to which the codical scribes applied their own orthography[794]. Especially with CaC roots, the reader could also choose if he wants to reinterpret this spelling in favour of a Yukatekan morphology. This would also make the codical preference of underspellings the result of the diglossia situation, but as the effect would be restricted to transitive verbs only, this option is less favourable[795].

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the fronting of the agent is not possible with a nominalised verb, so the entire sentence must read "it is him who created it."

[793] The suffixation with =**wa** among morphographic roots as schemes 2.e.i and 2.e.ii is therefore the 'strong' evidence for a transitive verb form, while phonemic complementation with a **CV$_1$** syllabogram could be considered as a 'weak' graphematic indicator for a verb in contrast to a nominalised form (see Figure 108e for a nominalised form with a phonemic complement, but lacking an ergative pronoun). Problematic then remain 2.g.ii spellings, of which only three with *chok* are attested and which are likely a deliberate omission because of a Tzeltalan vernacular (see footnote 796). The little amount of 2.g.ii samples is of course also a direct result of the criteria of exclusion: **u=CVC** spellings are considered as nominalised forms and are not sampled among the showcases, unless there are reasons the assume the contrary.

[794] See footnote 586 for general considerations for the change of a writing system in a vernacular context. Zimmermann (1956: 11-12, pl. 5) was able to identify eight different scribes in the Dresden Codex and noted that each individual had a certain preference of the graphemic lexicon and the representational rules. As morphographic spellings with =**wa** alternate with syllabic underspellings, it would be interesting to investigate whether scribal hands could be identified between these two groups. This might support the orthographic variability as the result of an individual interpretation of the morphology. As such investigation is palaeographic and is not necessarily supported by a grapheme classification, the data set does not provide parameters to pursue this question at this point. But the question remains why morphographic roots were not indicated with a phonemic complement as a 1.g.i **u=CV$_1$C-CV$_1$** spelling in an analogue reinterpretation process. However, as =**wa** is almost exclusive to **u=CH'AB=wa** spellings (35 in total), the scribe(s) might have preferred the 'strong' opposite to the 'weak' graphematic indicator. The edition history also plays a crucial part, if one scribe might have started one way, others might have followed. On the other hand, all 13 underspellings of scheme 1.g.i among showcase 2ANTIP also exclusively appear in the Dresden Codex, which may indicate a general tendency towards defective spellings. Other alternatives are discussed in Chapter 4.1.10.

[795] If a **u=CV$_1$-CV$_1$** spelling would leave the choice for a *u-CV$_1$C-V1* or a *u-CV$_1$C-(a)j* reading, then other differences between Ch'olan and Yukatekan morphology might find regular reflection by underspelled forms, e.g. with the passive. Section 1 in Chapter 3.3.6.2 also investigated this issue, only finding an increase of **CV-Ca** spellings in the Madrid Codex, but not the Dresden Codex. While only underspelled CaC root transitives enable the interpretation as a Yukatekan form, no such correlation can be given for any passive spelling that imposes *CV<h>C-a[j]*, and not *CVC[-bi]*.

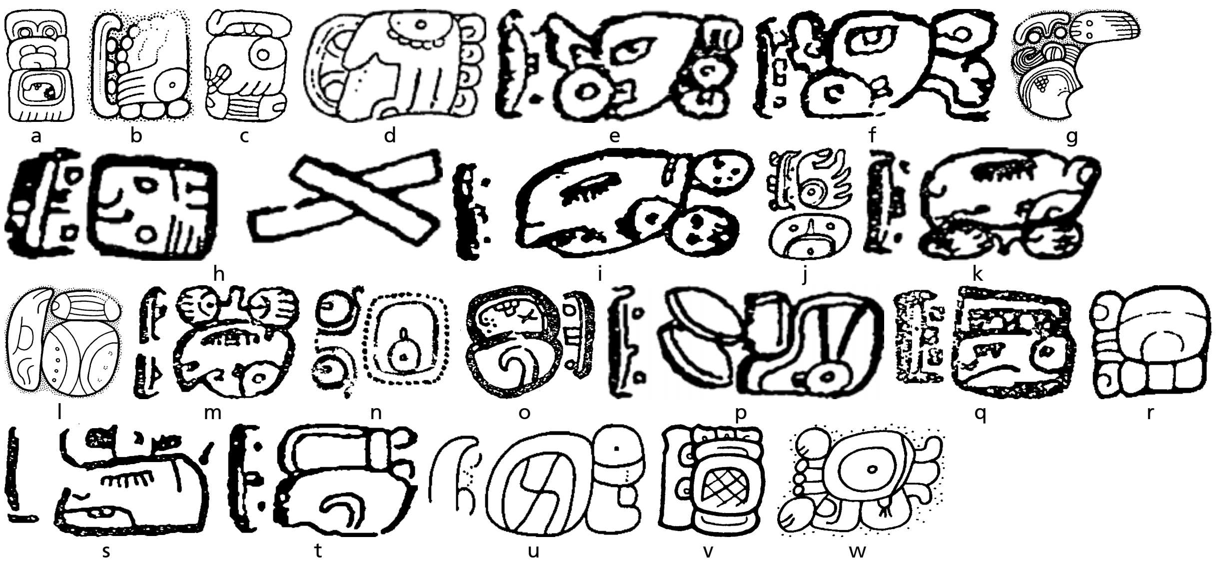

Figure 103: Examples of root transitives with different underspellings. **a) u=bu-t'u** (QRG St. E, C20a), **b) u=CH'AM-ma** (OXP St. 18, D4), **c) u=CHOK-ko** (CPN T. 22a Stone, E4a), **d) u=CHOK CHAJ**^{ji} (TNA Mon. 164, Q1)[796], **e) u=chu-yu** (C Dr. 2c), **f) u=chu=wa** (C Dr. 2c), **g) u=hi-li** (TRT Mon. 8, A9a)[797], **h) u=JEL-le** (C Ma. 21c)[798], **i) u=k'a-la** (C Dr. 2d), **j) u=K'AL-la** (TIK MT. 55:A, A3), **k) u=k'a-ma** (C Dr. 2d)[799], **l) u=ko-bo** (EDZ HS. 1, 80), **m) u=ma-k'a** (C Dr. 13b), **n) u=mo-lo** (C Dr. 10c)[800], **o) u=mu-ku** (C Ma. 109b), **p) u=nu-chu** (C Dr. 9b), **q) u=pa-k'a** (C Ma. 101d)[801], **r) u=pa-ta** (CRC Alt. 10, D1), **s) u=ta-k'a** (C Ma. 14a), **t) u=tu-mu** (C Dr. 4c), **u) u=TZ'AK=a** (HLM Frz. 1, pA5), **v) u=tz'a-pa** (NMP St. 2, D4), **w) u=tz'a=wa** (KAB Str. 1A1 Panel, C2).

[796] This example together with two others is considered as a 2.g.ii underspelling, as no =**wa** suffixation occurs. Refer to footnote 315 for the rationale to assume no indicative root transitive marker as a possible Tzeltalan vernacular. Compare this spelling with other nominalised *chok* spellings (Figure 108b) and refer to Chapter 4.3.4.2 regarding the graphotactics.

[797] See footnote 315 to possibly interpret this example as a CHN vernacular *–i* [+COM] suffix. This case is of course difficult to judge, as a regular ClM root transitive marker would also be simply *–i* with a CiC root. Still, I find two arguments in favour of a vernacular form: we already have the inchoative derivation *–m-aj* attested in Tortuguero (Figure 77g) which became typical for a WCh scheme by the Late Classic. Secondly, there are graphotactical considerations, as it may have been the scribe's intent to deliberately indicate a vernacular form by omitting the =**wa** suffixation. Less likely, the elision is the result of a subjunctive, as the typical markers (Figure 104) are missing.

[798] Note the sign transpositions (see Chapter 4.2.1.1) of the morpheme string as **u-le-JEL** as a result of the more loose orthography in the Madrid Codex (cf. Vail 2000: 48). Also see figure 103o for a similar case.

[799] While this example is clearly an indication for the Yukatekan cognate *k'am* (instead of the ClM *ch'am*), there might be one indication for such pronunciation on PAL T19B-W, F2b with **k'a-ma**=**TWISTED.ROPE**. Because of a substitution pattern with MZD on PAL T18S, F7, Stuart (2005b: 28-29, 93, 103, fig. 18) speculates on nominalised compound *k'am-Ø+TWISTED.ROPE-Ø* with a distinct pronunciation. The **CH'AM** reading for MZD was established by a preposed complementation (Figure 119b). In Stuart's line of argumentation, Palenque exhibits several equalisations of [k] ~ [t͡s] and [k'] ~ [t͡s'] (also see the discussion about *ok-ib* in footnote 892) that have not been systematically investigated (including neighbouring sites).

[800] Proposed translation for *mol*: "to join, to gather". Compare to CHR *mori*, "scoop or gather up, gather together in piles, […]" (Wisdom 1950: 529) and YUK *mol* "juntar, allegar, ayuntar" and "coger y plegar costura" (Barrera Vásquez 1993: 528), although the second meaning is unlikely.

[801] The examples from the codices translate as "to plant". While "to form, to mold" is also attested in Yukatekan (cf. Barrera Vásquez 1993: 623-625), "to plant" cannot be derived from Ch'olan languages. This meaning has been assumed by **u=pa-k'a K'UH-tzi=li** < *u-pak'-a[j]-Ø k'uhtz-il*, "he plants tobacco" on C Dr. 15a3 (cf. Boot 2009b: 145) and the association with the diving gods carrying vegetable attributes (Thompson 1972a: 46-47). However, for the almanac C Ma. 101d, Förstemann (1902: 143) assumes that Gods C and D receive sustenance. YUK also attests *pak'*, "esperar, aguardar" (Barrera Vásquez 1993: 623) which may be another possibility in this instance. Also compare to footnote 783.

A few examples are not considered to represent the declarative mood, but the subjunctive (Figure 104). We can observe the same spelling patterns regarding the suffix as with the regular indicative root transitive verbs. The indicator for the subjunctive are either preposed particles or the prefixation with the *x–* future marker (cf. Kaufman 1994, A 2a: 10-11, Sattler 2004: 371, Stuart, Houston and Robertson 1999, II: 33).

Figure 104: Examples of root transitives in subjunctive mood. **a) xa=k'a-la** (PAL T21B-P, X1a)[802], **b) u=ti-mi** (PAL TI-W, C3)[803], **c) xa=yu=UK'=wa** (TIK MT. 9, F1)[804].

When discussing the orthography of non-CVC and derived transitives (Figure 105) with a disharmonic *–V* suffix, it must again be stressed that it is not a thematic suffix, as this was already *–*Ø* in pGT (see Chapter 3.1.3.1). It is derivational and stem-formative as the proper verbaliser of nouns.

802 The reason to analyse as *x-a-k'al-a-Ø*, "you will bind it" was worked out between Barbara MacLeod and Sven Gronemeyer in December 2011 in relation with the context and iconography, although much remains linguistically unclear. The scene depicts a supernatural rodent figure, handing over a bundle (of paper/cloth?) to an attendant of *Ahkul Mo' Nahb* III who himself holds a personified lancet (Joralemon 1974) while impersonating the Palenque lineage founder 'Casper'. The text continues with **K'UL**$_{\text{PATIENT}}$ **tu=tu-mu-ya=si ch'o**$_{\text{PREP}}$ **EBET**$_{\text{AGENT}}$ (PAL T21B-P, X1b-X3), where the agent must likely be understood as an ejaculation in reference to the 2SG.ERG pronoun of *k'al*. The prepositional phrase may refer to the bundle. MacLeod proposed the GOD.C.HAND sign to read **K'UL**, "penis", to refer to the male primary source for bloodletting (cf. Gronemeyer 2003: 9-10). This proposal also considers the graphemic similarity to AMC **K'UH**. Compare to the syllabic spelling **k'u-li=si** on NAR K1398, H3 (Beliaev and Davletshin 2006: 25). The whole phrase may relate to the sense: "You, messenger, will bind the penis in the 'perforation bundle'" as a direct speech instruction of what to do.

803 There is some reason to consider the two occurrences of **u=ti-mi** on PAL TI-W as subjunctive forms, and analyse as *u-tim-i-Ø*, thus also denying a possible vernacular CHN form (see Figure 103g). In comparison with the 'regular' spelling with **=wa** (Figure 100i) on the same monument, the underspelling seems either to be a text-internal convention or typical for Palenque (Figure 104a). More decisive are the preposed optative particles *ichik* in D2 and C8 (see footnote 164) to indicate subjunctive mood, thus no affigated tense/aspect marker is required. Both examples are associated with future dates, the first in C3 with 9.13.0.0.0, the in D8a with 10.0.0.0.0. The 13$^{\text{th}}$ *K'atun* ending is one yet to be celebrated by *K'inich Kan Bahlam* II, while his father *K'inich Janab Pakal* rejoiced his last one on 9.12.0.0.0. This makes the accession date of *K'inich Kan Bahlam* II on 9.12.11.12.10, mentioned in the last phrase of TI-W, T8-T10, the contemporary date of the tablets from the Temple of the Inscriptions. There, he also makes explicit reference (S11-T12) that he devoted himself to the completion of the temple: *y-ak'-a junta[h]n balun-e[h]t-nah u-k'uh-k'aba' u-muk-[i]l k'inich janab pakal k'uh bak-[a]l ajaw*, "he gave it devotion, *Balun-Eht-Nah* is the god-name of the burial of *K'inich Janab Pakal*, the Palenque-God-Lord" (PAL TI-W, S11-T12). The future 9.13.0.0.0 is also in accordance with the dedication dates on the outside of the temple superstructure, as proposed by Mathews (1993) and narrowed down by Guenter (2007: 3-4) as a day between 9.12.16.13.12 and 9.12.16.14.12.

804 Note the inevitable overspelling of the tense/aspect marker **xa=** by the analysis as *x-y-uk'[-u]-Ø*, "he will drink it". In contrast to the Palenque examples, the subjunctive status marker is indicated by a **=wa** sign, maybe because the root is spelled by a morphograph (thus as a visual marker). Houston (2008) considered the presence of the **xa** sign to denote the adverb *xa'*, "again" (see footnote 44) and proposed the charming idea of "an early record of a toast" in connection with *uk'*.

The distribution between =**wa** and =**Ø** is more even among these verbs, although 18 samples is not a statistically significant sample size. As among root transitives, the spelling schemes 1.a.i, 1.g.i, 2.e.i and 2.g.i are attested. But in contrast to root transitives, non-integrative syllabic spellings are attested (Figure 104a), these are four cases of **yi=li=wa** < *y-il[-a]-Ø* from Chichen Itza as scheme 2.d.i. No preference can be made out that =**wa** is used more often with morphographic root spellings.

MacLeod's (2004: 296-297) discussion of irregular stems leaves the impression that such spellings should not occur with a =**wa** suffix at all, as these take a *–V* suffix and not the ****–V_1w** suffix cued for root transitives in ClM. Interestingly, the opposite is true, although with a lesser ratio than among CVC ~ ʔVC roots. If this argument is reversed, then =**wa** does not necessarily impose a **–V_1w / __# suffix with root transitives as well.

While non-CVC and derived transitive verbs primarily occur in perfect aspect in secondary position, MacLeod (2004: 300) discussed two instances, where =**wa** is suffixed. Both appear after a calendrical notation in primary position, as do others (e.g. Figure 105a, e-f). I therefore do not necessarily follow MacLeod's view that these verbs were treated as root transitives in some instances. They are simply an indicative form with the typical =**wa** suffixation, irregardless it is a root or a derived transitive. And while the perfect is typical for secondary verbs, there are some instances (e.g. Figure 105b, d), where a plain indicative form occurs.

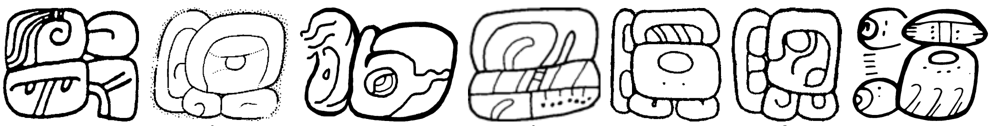

Figure 105: Examples of derived transitives in indicative mood. **a) yi=li=wa** (CHN T4L-L2, D2), **b) yi=IL=wa** (UXL St. 13, B6), **c) yi=IL** (COL K8076, L2)[805], **d) yi=ta** (TIK Marcador, D2)[806], **e) u=ka-ba=wa** (QRG Alt. O', J'6b)[807], **f) u=KAB=wa** (QRG Alt. O', I'4a), **g) u=tz'i-ba** (NTN Dwg. 66, J1).

There has been made frequent mention of the blur between positional and transitive roots (Wichmann 2002a: 7-8) in this study. So far, the literature has only treated this as a unidirectional process, i.e. that positionals can be inflected and derived as they were transitives. But there are no transitive roots going the other direction, i.e. with the positional causative =**bu** suffixation. However, no attention has been paid to transitive roots with a suffixation pattern that is typical for intransitive posi-

805 The clause of this example shows an unusual structure, as it appears to be fronting the agent. It starts with *ch'a[h]t* to refer to a dwarf (Prager 2002b: 57-60), followed by his nominal phrase, then follows *y-il[-a]-Ø* as the verbal statement, and finally *ix nal?* as the patient. It fits to the scene of a dwarf standing in front of a woman reclining on a bench, looking at her while seemingly tampering with his loincloth. Not the spelling **ch'a-ja-ta** in this case instead of the more regular **ch'a-ti** (e.g. YAX HS. 2 VII, W1), indicating aspiration (with /j/ ~ /h/).

806 This case is doubtful to a certain degree. It appears in secondary position of a phrase, hence it could also be an underspelled perfect *y-it-a[j]-Ø*. But as underspellings among derived transitives are more typical for showcase 2IND than 4TEMP, I tend to consider a completive indicative form. Compare to Figure 174c.

807 The meaning and reading of the 'auspices' verb was deduced by Stephen Houston (cf. Stuart, Houston and Robertson 1999, II: 98) on the basis of the Colonial TZO verb *chabi*, "govern, guard, watch over" (Laughlin 1975: 107, 1988: 184) as *kab-i*. I consider this full syllabic spelling of an indicative as evidence for a 1.a.i spelling, hence we can assume that spelling should indicate the factive *–a* suffix. With regard to perfect examples, there is more evidence, see footnote 944 for the full line of evidence.

tionals (Figure 106) with =**wa-ni** ~ =**la-ja**. Some examples are only provided for reasons of completeness, as these are not part of the showcases. The only assumption then to be made in this connection is a special semantic emphasis when a transitive is 'derived' as an intransitive positional.

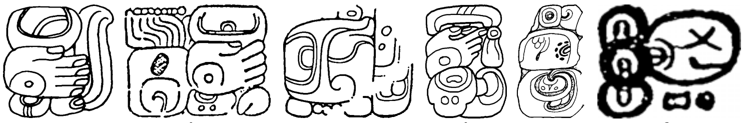

Figure 106: Examples of root transitives with positional suffixation. **a) K'AL=wa-ni** (PAL TS, P7), **b) K'AL=wa-ni=yi** (CPN T. 11 EDNP, C3), **c)** **^{2}tzu=la-ja** (PMT Mon. 11, Ap4), **d) NAH TZUTZ=la-ja** (CPN St. 2, D6a), **e) yu-ku=la-ja** (PAL T18, 250), **f) yu-ku=la** (C Dr. 60b, B3a).

In summary, rather uniform spelling practices make the orthographic discussion of indicative transitives straightforward, as it was already implied by the statistical figures. Synharmonic spellings leave little doubt that the suffix vowel among root transitive verbs is $-V_1$, and several spellings among the group of non-CVC and derived transitives spell the *–V* suffix in congruence with linguistic data. Moreover, the orthographic preference to indicate the transitive marker by =**wa** would, in comparison with other suffix spellings, leave little doubt that the root transitive marker would indeed be **$-V_1w$ / __#.

When combining the view with the development within the WM branch (see Chapter 3.1.3.1), it seems just to second the view that "the cognate morpheme set is archaic, [and] the *-w can be reconstructed" (MacLeod 2004: 296). The reflection of archaic forms in ClM is attested with other cases, such as absolutive noun markings (Zender 2004b) that became replaced by innovated forms or lost in the later history of Ch'olan languages (see Chapter 3.1.1.4). Wald (2007: 224-225) considers that underspellings are testimony of language change, or rather the reflection of spoken languages in the conservative writing system. He cites very late examples to proof the point, but the sampling has gathered cases in the 8th *Bak'tun*, with a regular but limited appearance from 9.10 on (Figure 46). Such scarce distribution can hardly be taken as evidence for language change, but as an occasional variation.

From the epigraphic point of view, there is in fact little support to assume a $-V_1$ suffix only. The amount of underspellings is not significant enough, except for the codices. If the indications of codical forms are correctly interpreted, this is one clue. But probably the best support comes from the frequent suffixation with and not the omission of =**wa** among non-CVC and derived transitives, as these never have a final glide. This strengthens the function of a simple graphematic marker in the writing system, without any phonemic function in final position.

The argumentative burden lies on the shoulders of linguistics. Without necessarily reiterating the arguments of Chapter 3.1.3.1, the main points are: (1) already a pGT *$-a$ / *$-V$ suffix; and (2) the ignorance of ClM morphophonemics I propose with $-V_1$ / __# versus $-V_1w$ / … reconstructable from pM on. Comparing the pGT reconstruction with Greater Q'anjobalan languages and especially the pattern attested in TOJ, I still would confirm that ClM reflects a certain conservatism that was likely already lost in pCh.

The suffixation with =**wa** / __# then is fossilised and only indicative that a morphophonemic alteration may apply. It has no phonemic function by indicating the reader this is a verbal and not nominalised form. It is in fact rather an overspelling, a suprasegmental morphological indicator. Thus, the root transitive marker is unlike any other =**CV** / __# suffixation that are indeed necessary to spell out a –*VC* morpheme. And if the assumption is correct for ClM, the root transitive marker is the only suffix with such alloforms.

The syllabification of root transitives depends on the root shape, *u-CV*$_1$*C-V*$_1$ is a trisyllabic form *[ʔu.CV.CV], while *y-V*$_1$*C-V*$_1$ is bisyllabic *[jV.CV], but all syllables are open light. Derived transitives may involve open heavy syllables, such as *u-tz'i[h]b-a* as *[ʔu.t͡s'ih.bə]. Based on Ch'olan data (Table 36), it seems reasonable to assume the allophone [ə] rather with CaC roots and as the pronunciation of the factive suffix. The aspect of tense/aspect marking as been excluded here, as it is not relevant for the vocalisation of the suffix and the underlying orthographic practices, which are condensed in Table 81.

Type	Transcribed Paradigm	Canonical Spelling
-IND **CVC / ʔVC** **VER.TR.R**	*u-CV*$_1$*C-V*$_1$*-Ø*	**u=CV$_1$-CV$_1$=wa / u=CV$_1$C-CV$_1$=wa** **u=CV$_1$-CV$_1$ / u=CV$_1$C-CV$_1$**
	y-V$_1$*C-V*$_1$*-Ø*	**yV$_1$=CV$_1$=wa / yV$_1$=V$_1$C-CV$_1$=wa** **yV$_1$=CV$_1$ / yV$_1$=V$_1$C-CV$_1$**
	u-CV$_1$*C[-V*$_1$*]-Ø*	**u=CV$_1$C=wa**
	y-V$_1$*C[-V*$_1$*]-Ø*	**yV$_1$=V$_1$C=wa**
	u-CV$_1$*[C-V*$_1$*]-Ø*	**u=CV$_1$=wa**
-IND (vernacular) **CVC / ʔVC** **VER.TR.R**	*u-CV*$_1$*C-i-Ø*	**u=CV$_1$-Ci**
	u-CV$_1$*C-Ø-Ø*	**u=CV$_1$C**
-SBJV **CVC** **VER.TR.R**	*u-CV*$_1$*C-V*$_1$*-Ø*	**u=CV$_1$-CV$_1$**
	x-V-CV$_1$*C-V*$_1$*-Ø*	**xV=CV$_1$-CV$_1$**
	x-y-V$_1$*C-V*$_1$*-Ø*	**xa=yV$_1$=V$_1$C=wa**
-IND **non-CVC** **VER.TR.D**	*u-CV*$_1$*(h)C-V-Ø*	**u=CV$_1$-CV=wa** **u=CV$_1$-CV**
	y-V$_1$*C-V-Ø*	**yV$_1$=CV=wa** **yV$_1$=CV**
	u-CV$_1$*C[-V]-Ø*	**u=CV$_1$C=wa**
	y-V$_1$*C[-V]-Ø*	**yV$_1$=CV$_1$=wa / yV$_1$=V$_1$C=wa** **yV$_1$=V$_1$C**

Table 81: Morphological paradigms and canonical spellings of root and derived transitives.

4.1.9 – Transitive Nominalisers –Ø and –*i*

Although the –*i* and –*Ø* nominalisers are not part of the showcases, they deserve a brief excursus, as they appear among the inchoative (Figure 78). Their morphosyntax and orthography also serves to contrast a transitive root in indicative mood: (1) as a morphographic spelling with no phonemic complement; (2) a spelling with a root harmonic syllabogram whose syntax however imposes a nominal form; or (3) a spelling whose final syllabogram or complement is different to a root harmonic transitive underspelling (especially with the contrast **CV**$_1$ versus **Ci**). While the evidence for –*i* is rather weak and interpretable in different ways, there is a good support for –*Ø* in the epigraphic record. Before coming to speak to the environments where such nominalised forms may appear, the morphology and its representation in writing is discussed.

Footnote 357 theorised on the existence of a nominalising *–i* among causative positionals and nominalised antipassives. In a first instance, a compound of a nominalised syncopated antipassive such as **u-k'al-w-i+tun-Ø* < **u=K'AL=wi TUN**$^{\mathbf{ni}}$ (CRC St. 16, B16) seems reasonable to explain the infrequent suffixation with =**wi** among transitive roots (Figure 102). But as Chapter 4.1.8 discussed, an intermediate intransitivation is unnecessary, as a nominal 'incorporating antipassive' is directly possible. This possibility is therefore discarded.

Clearer is the case of **u-pat-bu-hi-Ø* < **u=pa-ta=bu=hi** (Figure 107h), appearing as part of a possessive phrase with *Yax Pahsaj Chan Yopat* as the possessor. Altogether, it is the argument of an antipassive verb. But alternative interpretations are still possible[808] without necessarily rejecting a nominalised form. Other cases of a **Ci** syllable at the juncture of a morpheme chain remain doubtful[809].

In case the putative *–i* suffix is directly attached to the transitive root, another problem area is the distinction of the final **Ci** sign from disharmonic spellings. A case like Figure 107c can be interpreted as **CHOK-ki**, in support of the *–i* suffix. As **CHOK**$^{\mathbf{ki}}$, it implies that *chok* is otherwise a disharmonically spelled root, and **cho-ko** ~ **CHOK-ko** (Figure 100b-c) a change owed to spell out the transitive status suffix. Unfortunately, evidence for the harmony patterns of transitive roots is scarce, and the patterns are not always decisive[810]. In the end, if all cases with a **Ci** syllabogram are indeed only indication for disharmony pattern, a nominalisation can still be achieved by a –Ø morpheme.

The postulation of the –Ø nominaliser builds on epigraphic evidence and linguistic inference. Object incorporations in Ch'olan languages do not allow tense/aspect marking (see Chapter 3.1.3.2). This is less the result of the resulting compound being a nominal form, but because the verb has to be

[808] In this case, the antipassive verb (see footnote 71 and Figure 64d) does not have the agent expressed (while referring back to the alter mentioned before). Then, the nominalised depositive positional is analysed as a stative predicate, binding *Yax Pahsaj Chan Yopat* as the subject. A causative positional alone could not explain the additional **hi** sign. But as the clause appears in secondary position after an antipassive, the **hi** sign may be a later, aberrant spelling for a perfect **u-pat-b-uj-Ø* with an oblique patient (the aforementioned altar).

[809] See Figure 107i with **u=PAT=na=hi**. It can be analysed as *u-pat-[a]n-(h)i-Ø*. There are cases known of *pat* acting as a transitive in antipassive diathesis, e.g. **i PAT-ta=ni** < *i[']* *pat-[a]n-Ø* (RMC Msc. 1, 8). Such form does not explain **hi**, as the nominalisation would not require an epenthesis, in contrast to the case from CPN Alt. Z. A spelling with **ni** would be sufficient to provide the *–i* nominaliser, but **na** is specifically used for *patan*, "tribute" (cf. Stuart 1995: 354-355), e.g. **u=pa-ta-na** on K4996, Q1. But as *patan* is already a lexicalised noun, the **hi** still remains opaque. Another case might be **AJ pa-ya=li=ji ju-ku=bi** < *aj pay-l-i(j) juk-ub* on PNG P. 2, Z2-Y3 (brought to my attention by Jarosław Źrałka, personal communication, January 2011). The verb *pay*, "to guide, to lead" is obviously derived into a participle and then takes some further *–i(j)* suffix to nominalise the form. The exact segmentation remains unclear, but as a whole, the title might relate to the coxswain of a canoe.

[810] A good example is the root *k'al*. Among its passive spellings, we find ambiguous cases like **K'AL-la=ja** (Figure 50d) that is taken as a scheme 1.a.i spelling, but could also be 1.d.i. The latter alternative can be nurtured by the case of **K'AL**$^{\mathbf{li}}$**=ja** (Figure 55f), but which remains weak support by its uniqueness. There are also nominalisations (Figures 107f-g, 108n, q) that again can either be (**u**=)**K'AL-li** with the *–i* suffix or simply a disharmonic spelling (**u**=)**K'AL**$^{\mathbf{li}}$ with the *–Ø* nominaliser. The latter alternative finds support in nominalisations with just (**u**=)**K'AL** (Figure 108m, o, r) or a synharmonic complementation (**u**=)**K'AL**$^{\mathbf{la}}$ (Figure108p). When comparing the frequency among the instances of nominalised *k'al* expressions sampled, there are 129 cases with no phonemic complement, 8 samples with **li** (including 2 syllabic spellings) and only 1 with **la**. These figures clearly indicate that *–Ø* is the nominaliser of choice, but they do not disprove *–i* as another nominaliser of lesser frequency and opt for *k'al* to be a disharmonically spelled root. Also compare the case of *puk* in Figures 107j-k.

nominalised before to enable incorporation and compounding. That such nominalised verbs occur, is clearly shown by the epigraphic record when such forms appear outside a compound and may only take an ergative pronoun (Figure 107). Several paradigms can be distinguished, depending on their role in the syntagma.

Such stand-alone nominalisations often do not take an ergative pronoun, acting as a stative predicate, e.g. **NAH CHOK-ki** < *nah chok-i-Ø*, "it (was) the first binding" (Figure 107c). These statives can bind a nominal subject: **^{pu}PUK u=K'AK'** < *puk-Ø-Ø u-k'a[h]k'* (Figure 107k) and **PUK-ki u=K'AK'** < *puk-i-Ø u-k'a[h]k'* (Figure 107l), "scattered (was) his fire"; and similarly **TIL K'AK'** < *til-Ø-Ø k'a[h]k'*, "drilled (was) fire" (Figure 107m). Often, such predicates are directly followed by a prepositional phrase: **CHOK ti PET-ne** < *chok-Ø-Ø ti pet[e]n*, "it (was) thrown across the lagoon" (Figure 107b); **STAR.WAR ti SEIBAL** < *STAR.WAR-Ø-Ø ti SEIBAL*, "it (was) Star War against Seibal" (Figure 107p); sometimes the subject may explicitly be stated following the phrase, as in **JOY ti AJAW=le ? ? CHAK K'AN^{na} AK K'UH yo-bi AJAW**< *joy-Ø-Ø ti ajaw-le[l] ? ? cha[h]k k'an a[h]k k'uh yo[ki]b ajaw*, "he (was) bound into rulership, Ruler 2, Piedras Negras God-King" (Figure 107f). In case the nominalised root is inflected with an ergative pronoun, it is the predicative of a possessive relationship: **u=JOY u=le-e ku-tzi** < *u-joy-Ø-Ø u-le' kutz*, "it (is) the binding of the noose of the turkey" (Figure 107e).

Some examples may appear in other syntactic positions, such in a prepositional phrase: **che-he-na u=yu-lu ti tz'i-ba** < *chehen-Ø u-yul ti tz'i[h]b-a-Ø*, "it (is) said (by) his polished object with the writing" (Figure 107n)[811]. A similar example takes the nominalised form as the subject: **che-he-na u=tz'i-ba** < *chehen-Ø u-tz'i[h]b-a-Ø*, "it (is) said (by) his writing" (K1775, O1-P1). A case like **u=K'UH-hu=lu tza-ku** < *u-k'uh-ul tzak-Ø* (Figure 107n) in subject position is also a clear indication for an unattached form exhibiting a disharmonic root spelling (in contrast to an altered root harmony, see Figure 52c).

As tense/aspect marking is not possible with nominalised forms, a relative position in narrative time can be expressed by the temporal deictic enclitic. An example is **STAR.WAR=ya** < *STAR.WAR-Ø=[i]y*, "after it (was) Star War" (Figure 107q)[812], an earlier event related to the previously mentioned *K'atun* ending (cf. Teufel [2004: 452] for the calendrical reconstruction).

[811] It is interesting that the *yul*, the polished and inscribed surface of the vessel is here introduced by the quotative particle (Grube 1998a) *chehen* that indicates a speech act. The 'enabler' for this is specified in the prepositional phrase: it is the writing that uses the ceramic vessel as its carrier or medium through which is spoken to the reader. See footnote 83 for the orthographic reason to assume a re-nominalised form of the derived transitive *tz'i[h]b-a*.

[812] Such a spelling is also contrastive to **=yi** mediopassive derivations of this verb (Figure 128a), likewise making the 'Earth Star' variant without any suffix nothing but a nominal spelling of the full variant of the complex **STAR.WAR** sign (where the EARTH part might be superimposed by a prepositional phrase as in the present example or by a compounded noun as in Figure 108y). In the 'Shell Star' variant then, the EARTH part is superimposed by **=yi**, as a comparison with variants with a post- or subfixed **=yi** indicates (Figures 128b).

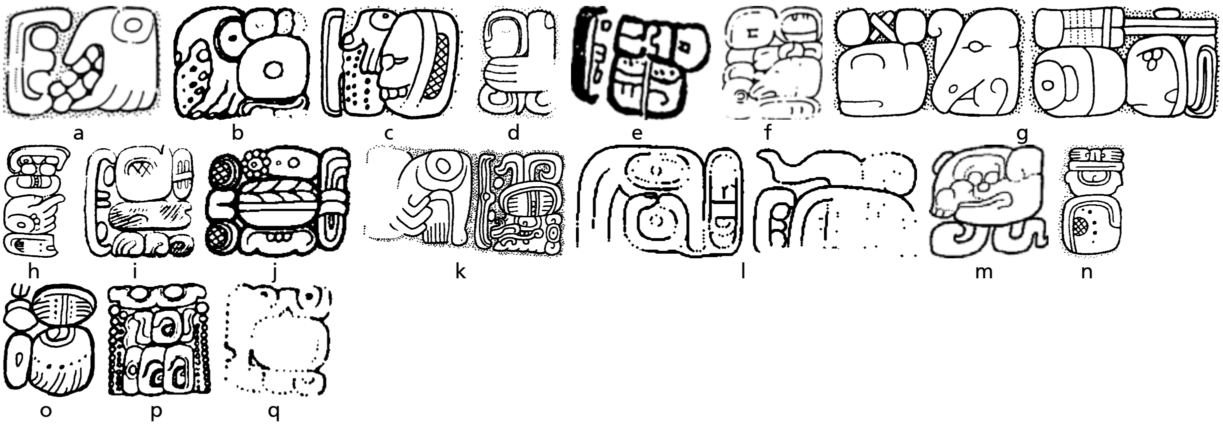

Figure 107: Examples of single nominalised transitive verbs. **a) u=CHOK** (NMP St. 1, C3), **b) CHOK ti PET-ne** (NAR St. 23, E21), **c) NAH CHOK-ki** (TRT Frg. 1, pE1), **d) CH'AM=ya** (PUS St. P, D4), **e) u=JOY** (C Ma. 91a3), **f) JOY ti AJAW=le** (PNG St. 36, B8), **g) u=k'a-li ta u=11 TUN^{ni}** (COL Jmb. Amparo, Ap5-Bp6), **h) u=2 K'AL-li** (TNA Mon. 141, B5a), **i) u=pa-ta=bu=hi** (CPN Alt. Z, D3), **j) u=PAT=na=hi** (CNC P. 1, M5), **k) ^{pu}PUK u=K'AK'** (PUS St. U, A8-B8), **l) PUK-ki u=K'AK'** (XNH St. 2, A5), **m) TIL K'AK'** (MTL St. 1, B5), **n) tza-ku** (YAX Lnt. 25, E1b), **o) ti tz'i-ba** (COL K7459, L3), **p) STAR.WAR ti SEIBAL** (DPL St. 16, C1), **q) STAR.WAR=ya** (PNG St. 37, C7).

A nominalised transitive root can incorporate another noun (or a noun sequence in a few instances) and form a compound (Figure 108). Such compounds can act as a stand-alone stative predicate, optionally taking an ergative pronoun, depending on the context: compare **7 $^{\#}$AJAW CHOK=ch'a-ji 3 BIX=OL** < *huk ajaw chok-Ø+ch'aj-Ø ux bix-o[h]l*, "7 *Ajaw*, it (was) a droplet-scattering, 3 *Kumk'u*" (Figure 108a) with **u=K'AL=wa TUN^{ni} u=CHOK=ch'a-ji** < *u-k'al[-a]-Ø tun u-chok-Ø+ch'aj-Ø*, "he bound the stone, it (was) his droplet-scattering" (Figure 108b)[813].

A predicative nominalised compound can be followed by prepositional phrases as well: **K'AL=HUN tu=BAH** < *k'al-Ø+hun-Ø t-u-bah*, "it (was) the headband-binding to the head of NN" (Figure 108m). The stative predicate may also bind a subject in a possessive relation, such as **u=TZAK=K'UH K'UH yo-ki=bi AJAW** < *u-tzak-Ø+k'uh-Ø k'uh y-ok-ib ajaw*, "it (was) the god-conjuring of the Piedras Negras God-King" (Figure 108u).

Compounds can also act the agent of a verbal phrase, such as in **u-ti tz'a-pa TUN^{ni}** < *u[h]t-i-Ø tz'ap-Ø+tun*, "it happened the stone-binding" (Figure 108x); or be the subject of a stative clause, as **u=BAH^{hi} ti-mi=°OL IX WINIKHAB AJAW** < *u-bah-Ø tim-Ø+o[h]l ix winikha'ab ajaw*, "it (is) the image of a heart-appeasing Lady *K'atun Ajaw*" (Figure 108s). Nominal phrases can contain a compound, like *K'inich Joy K'awil* of Caracol (Figure 108k).

[813] There is some possibility that in full-figure texts, glyphs carried in a bundle are an incorporated object, while the pack strap carrying it may be the representation of the *u–* ergative pronoun, e.g. on CPN Str. 9M-18 Hbh. 1, 7 or CPN St. D, D4 (cf. Gronemeyer [2006a: 13] for examples of the 'duplicated Glyph F'). But on QRG Zoo. B, 10, **u** allograph AA4 is attached to the belt, cf. Thompson (1950: 242, figs. 2.50-2.56, 5.28-5.33) for other examples of Glyph B with an ergative. The case of the FIRE.BEARER sign (Colas 1998: 101, 2000: 86-88) is harder to judge. Only two cases are known (NTN Dwg. 82, A2 and IXK St. 2, C3), and both only bind one argument. However, the text from Naj Tunich continues with *u-kab[-j]=[i]y* to re-introduce the agent, typically of a passivised verb. As Colas already assumed, the fire being carried is thus rather part of the sign's design and semantics? than the indication of the grammatical patient.

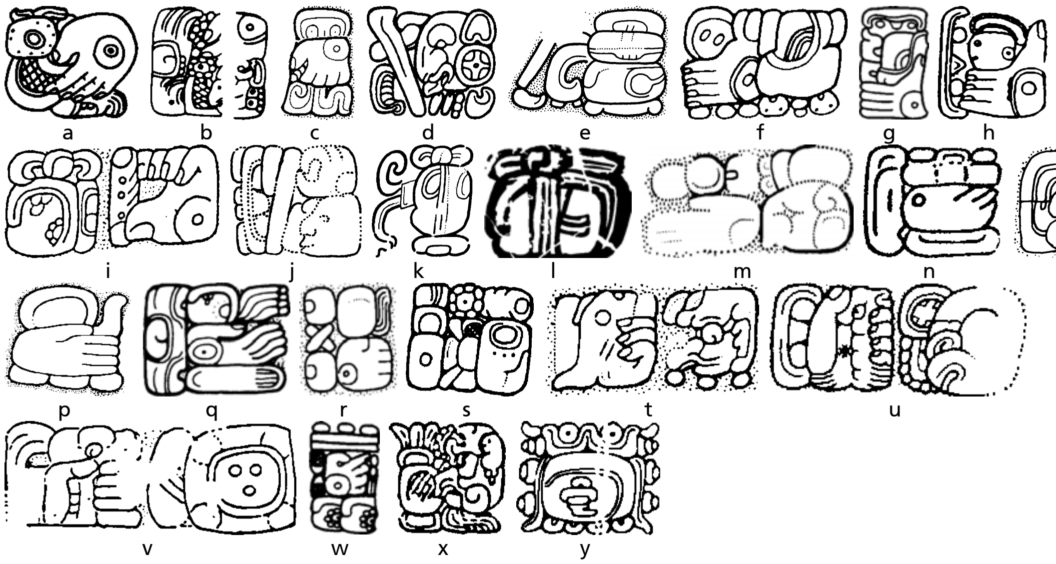

Figure 108: Examples of compounded nominalised 'object-incorporating' transitive verbs. **a) CHOK=ch'a-ji** (CPN St. J W, 32), **b) u=CHOK=ch'a-ji** (BPK St. 1, G3), **c) u=CHOK=K'AK'** (COL P. Denver, B5b), **d) CH'AK^{ka}=BAH=ji=ya** (QRG St. J, H3), **e) CH'AK^{ka}=SUM?=la u=CHAN=CH'EN** (TAM HS. 2 III, M1-N1), **f) CH'AM^{ma}=K'AWIL^{la}** (PAL T14T, B2), **g) u=CH'AM=K'AWIL** (QRG St. E, A8a), **h) u=CH'AM=K'UH** (SBL St. 9, C2), **i) hi-li=o-ke** (CPN Alt. Q, C2-D2), **j) u=JEL=k'o-ba** (PNG Alt. 1, L2), **k) JOY=K'AWIL^{li}** (CRC BcM. 4, C3), **l) JOY=TE'** (PCH 25B-1-6, G1), **m) K'AL=HUN tu=BAH** (CHP St. 2, B2-C2), **n) u=2 K'AL-li=HUN** (MRL St. 4, D7), **o) i u=K'AL=MAY** (PAL TC, C3), **p) K'AL^{la}=TUN** (TIK St. 8, B1a), **q) u=K'AL-li=TUN^{ni}** (MQL St. 6, A2), **r) u=K'AL=TUN^{ni}** (UCN St. 4, A2), **s) ti-mi=^{o}OL** (PNG St. 1, K11), **t) TZAK=K'AWIL^{la}** (YAX Lnt. 39, A2-B2), **u) u=TZAK=K'UH** (PNG P. 2, M1-N1), **v) u=TZAK=TOK=PAKAL** (CPN Alt. X, A2-B2), **w) 13^{nu} TZUTZ=PIK** (QRG St. F, D16a), **x) tz'a-pa=TUN^{ni}** (CPN St. A, A10b), **y) STAR.WAR=KAJ^{ji}** (TIK T. 4 Lnt. 2, B8).

The sampling also yielded evidence for a hitherto unrecognised possible nominaliser (Figure 109). Only one example has a known transitive root, though (Figure 109b)[814]. The sign sequence =**le-ja** opts for a suffix **–lej*, but the closest correspondence is the pCh **–le* transitiviser (Kaufman and Norman 1984: 145), not a nominaliser. However, the contexts of the three examples opt for a nominal form, especially **tu**=^{2}**ta**=**le-ja** < *t-u-tat-lej* spelling as a prepositional phrase. The full context of Figure 109a is **yu**=**UK'**=**bi k'e-ba**=**le-ja CHAK^{ki}** < *y-uk'-[i]b-Ø k'eb-lej+cha[h]k*, where the proposed nominal form compounds with *Chahk* and qualifies the deity name[815].

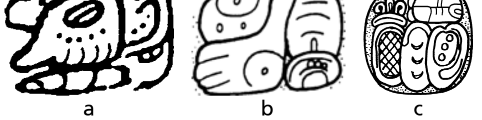

Figure 109: Examples of a putative nominaliser. **a) k'e-ba=le-ja** (COL K1226, B1), **b) CH'AM=le-ja** (COL P. Maegli 3, C5), **c) tu=^{2}ta=le-ja** (PAL HDPF, B1)[816].

[814] The example in Figure 109a suggest the root *chub*, which is not attested in any GLL language. For Figure 109c, the root appears to be *tat*, only attested as the common noun *tat ~ tata(')*, "father" in Ch'olan, plus the adjective *tät* in CHN and *tat* in CHR as "thick" (Knowles 1984-88, Wisdom 1950: 665).

[815] It may be an appellative of *Chahk* or name some aspect (cf. Lacadena 2004a). Although affixes are missing, this assumption is strengthened by what appears to be **k'e-ba CHAK^{ki}** on PAL PMI1, C5. However, small flakings make a distinction between ZY7, ZY8 and ZY9 problematic. Another instance is an underspelled **k'e-ba**=**le HEADLESS.BODY** on TAM HS. 2 III, A2-B2.

[816] A comparison between the photo and drawing in Robertson (1985b: pls. 221-222) shows the drawing to interpret a female head where the photo proves the YM2 **ta** allograph with the doubler sign in front. The drawing has been corrected.

The compounding of a nominalised verbal root with another noun precisely mirrors the formation process described for CHL object-incorporating 'antipassive' forms (see footnote 323). As ClM in contrast to modern Ch'olan languages still features a proper incorporating antipassive (see Chapter 4.1.10), the nominalised formation can be viewed as an alternate with different semantics. It accentuates more the state of being than the action or process[817].

This fits to the rhetorics of many monumental inscriptions as being "self-referential" and "time markers" (Stuart 1995: 107). When comparing the figures for certain roots, it is obvious that nominalisations are preferred for such impersonal statements[818]. But the more intriguing questions are some levels below rhetorics and semantics, and can only be touched briefly here.

The *–Ø* and possible *–i* nominaliser are functionally different to nominalisations by *–yaj* (Chapter 4.1.5), and the gerundive *–ol* (see Chapter 4.1.18). The scope is also enhanced in comparison with the apparent *–Ø* nominaliser of intransitive roots (see Chapter 4.1.14). As far as the data allow to conclude, incorporation and compounding in ClM seems to be restricted to the patient, which is typologically only possible with transitive verbs or derivations thereof (cf. Comrie 1978: 388-389). The *–Ø* suffix may derive some non-finite verb form, thus being more a syntactic than a semantic nominaliser. At least when occurring in predicative function, it acts like a construction with an expletive pronoun, so a more verbatim translation for *pul-Ø+k'a[h]k'-Ø* might be "it (is) to scatter fire", or "it (is) to bind into rulership the NN" for *joy-Ø-Ø ti ajaw-lel*. A final alternative may consider some roots as polyvalent, not requiring a nominaliser at all[819], putting the entire ClM root system and stem formation processes back under review.

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817 Although a certain equivalency is most obvious among the 'dynastic pots' (Martin 1997), where **CH'AM=K'AWIL(=ya)** < *ch'am-Ø+k'awil-Ø(=[i]y)* always lacks the ergative pronoun, because it is a stative compound. But it is clearly used in this incorporating 'antipassive' sense. Compare the vessels K1371 and K6751 (Martin 1997: fig. 1a-b), where the nominalised form and the incorporating antipassive **CH'AM=wa K'AWIL** < *ch'am-[a]w-k'awil-Ø* alternate. It is also important to stress again the two major difference of the nominalising scheme from compounding in Yukatekan: (1) compounds can be inflected (unlike Ch'olan) and continue to carry the verbal action (much like in Ch'olan, see footnote 333 for MOP example); and (2) compounds of VTR+NOUN form a noun (like in Ch'olan), but of a new meaning (unlike Ch'olan), e.g. *kis+lúʔum*, "dwarf" (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 370), literally "fart-land."

818 The use of *k'al* in accession statements, period endings and dedicatory phrases is distributed as follows: only 44 samples pertain to showcase 2IND, but 181 to 1PASS, 18 to 2ANTIP, and 138 are nominalisations. With *chok* for the scattering of any kind of substance, there are only 2 samples of showcase 1PASS, 13 of 2ANTIP, but 56 of 2IND, and after all 45 nominalisations.

819 Consistency is a major caveat, as a hybrid verbal and nominal nature cannot be assumed for all roots. Otherwise, no verbalisers such as *–a*, *–i*, or *–ta* (see Chapter 3.1.3.1) would be needed to derive a transitive verb, unless to occasionally indicate special semantics. If the idea is further pursued and radically trimmed to mere nominal roots, then a model emerges that is similar to the Egyptian 'standard theory' elaborated by Hans Jacob Polotsky and others (cf. Depuydt 1983, Junge 1978, Polotsky 1965). This idea has a certain appeal when considering that, like Egyptian, there is only little evidence for conjunctions in ClM. Egyptian rather uses 'secondary tenses' to establish conjunctions (cf. Schenkel [1997: 279-282] for the so-called 'emphatic construction' as one case) in cleft sentences. The use of the perfect along secondary verbs in ClM (MacLeod 2004) could be reviewed under such function. A comparative study involving the 'standard theory' and its alternate 'inverted standard theory' (cf. Schenkel 1998, 2006) might well prove fruitful for the development of ClM morphosyntax and a better understanding of discourse pragmatics. But such investigation is beyond the scope of the present study.

4.1.10 – Antipassive Suffix *–V_1w ~ –Vw ~ –w*

The discussion of this suffix needs to differentiate between its both functions. Overall, the standard spelling pattern has been determined as =**wi** ~ =**wa** (Table 73), but this considered the absolute and the incorporating antipassive together. The statistical analysis did not determine the lexical diversity of both functions and if the preference for =**wa** with CaC roots may be triggered by rhetorics. Such CaC roots could appear with a higher quantity among one function, thus biasing the observation and possibly making the suffixation pattern less determined by the root phonology, but by the type of antipassive construction.

The decision for an absolute or incorporating antipassive has to be made by a contextual and morphological line of inference. It has to consider the number of expressed nominal arguments following the antipassive verb, and also whether these act as the semantic agent or patient in the construction. Such conclusion is not always beyond doubt, especially in complex antipassive sentence names, discussed below. The examples illustrating the discussion try to provide either the agent with an absolute antipassive or the object with an incorporating antipassive to justify the attribution.

The linguistic review of antipassive suffixes (Chapter 3.1.3.2) revealed that none of the WM languages actually exhibits a root vowel harmonic suffix. A careful comparison of the root spellings with linguistically proven harmonic suffixes, such as the transitive marker (Chapter 4.1.8) and the mediopassive (Chapter 4.1.12), can support the question. Problematic is the small number of integrative spellings (Chapter 3.3.3.3.2) available for only some selected lexemes.

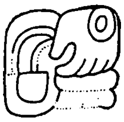
Only very few cases of absolute antipassives with CaC roots are attested (Figure 110). As long as the root is synharmonically spelled, no alteration of the final syllabogram is required and these cases are classified as scheme 1.a.i: **Ca-Ca / CaC^{Ca}** > **Ca-Ca=wa / CaC-Ca=wa** for a *CaC-aw* form. None of the attested lexemes can directly compare to the spellings of any other showcase.

a b c

Figure 110: Examples of absolute antipassives with integrative CaC roots. **a) ti ja-sa=wa CHAN^{na}** (COL Lnt. Retalteco, pB1-pC1), **b) ja-sa=wa t'e?-wa-ni** (TIK MT. 38:A, H2-H3)[820], **c) la-ma=wa EK'** (RAZ K7720, B2).

[820] Compare to Figure 115a for an underspelled variant. According to Davletshin (2010: 29, fig. 15), this is the posthumous name of *Jasaw Chan K'awil* of Tikal. While both names include the antipassive *jas-aw*, the functions need to be differentiated. In case of his life time name, we deal with an incorporating antipassive: *jas-aw-Ø chan k'awil*, "*K'awil* Sky-Clears" (see Figure 116b for an example). Davletshin connects the spelling on the Tomb 116 bones to the Teotihuacan rendering of the name of *Siyaj K'ahk'* on TIK St. 31, K2, there given as **t'e?-wa-k'i**. Together with the alternant **t'e?-wa-ni** from TIK MT. 38, he supposes both to spell the proto-Nahuatl *tle(wa)wa:n-tli*, "Lit-up Fire". This requires the 32B:XS3 compound to be a relational unit with the syllabic value **t'e**. If *t'e[wa]wan[k'i]* replaces the *chan k'awil* parts on TIK MT. 38, then *jas-aw-Ø* has to be an absolute antipassive, as an incorporation would not make sense. Hence the death name can be translated as "*T'ewawank'i* Clears." This interpretation also requires that the head variant indeed reads **sa**, as subgraphemic variants to the usual PM1 variant have been noted (Davletshin 2010: fn. 14).

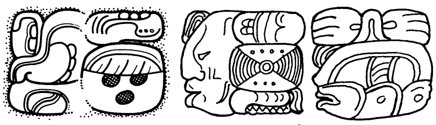
One example of another synharmonically spelled CVC root is attested for an absolute antipassive (Figure 111). As the sign MZS is not detailing any droplets, it is supposed not to spell out **CH'AJ**, therefore no object incorporation likely takes place[821]. It classifies as a 1.a.ii scheme following **CV_1-CV_1 / $CV_1C^{CV_1}$** > **CV_1-CV_1=wi / CV_1C-CV_1=wi** for a *CV_1C-V_1w* form. A root harmonic vowel is induced by the spellings of other diatheses (compare Figures 51c and 100b-c).



a

Figure 111: Examples of absolute antipassives with integrative other roots. **a) i CHOK-ko=wi** (CLK St. 33, F4).

There are two examples of absolute antipassives from nominal phrases that are non-integrative syllabic spellings (Figure 112). They are classified as 2.c.i cases, but final proof is missing that they are revealing the original root harmony pattern, as the underlying lexemes are not attested in any other context. The supposed orthographic process is **CV_1-CV_2** > **CV_1-CV_2=wi** for a *CV_1C-[V_1]w* form.



a b

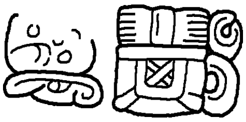
Figure 112: Examples of absolute antipassives with non-integrative root spelling. **a) chu-li=wi HIX** (DPL HS. 3 II, D2)[822], **b) IX ki-nu=wi ma-ta** (PAL SLAV, L1-L2)[823].

Absolute antipassives with a simple morphographic root spelling (Figure 113) are only attested with the root *lam* in connection with half period endings (Wichmann 2004a). All these cases classify as scheme 2.e.i, following a **CaC=wa** paradigm for a *CaC-[a]w* form.

[821] See footnote 790 for cases of *chok* with **=wi** suffixation considered as an active transitive. Lacadena (2000a: 165) discussed the same example, pointing out the difficulties in reading the eroded affixes as either **ko=wa** or **ch'a-ji**, making the block a nominal compound in the latter case. Based on photos, my own assessment is **CHOK-ko=wi**, also in palaeographic comparison with the **u=CHOK-ko=wa ch'a-ji** in block H2 of the same monument (cf. Lacadena [2000a: fn. 9] alternatively suggesting an incorporating antipassive with the prefix as possibly **i**).

[822] No satisfactory translation can be given for *chul*. No reasonable cognate of a transitive verb has been found in any GLL language. CHR features *chu'ri*, "wet, dampen" (Wisdom 1950: 712), and apparently related are CHL *chulu' ja'*, "chorrito de agua" (Aulie and de Aulie 1978: 29) and CHN *chulub*, "agua de lluvia" (Keller and Luciano 1997: 95). An absolute antipassive form, despite the disharmonic root spelling, is assumed by the morphosyntax of this name phrase of a Motul de San Jose lord, but "The Jaguar Dampens" is not necessarily meaningful.

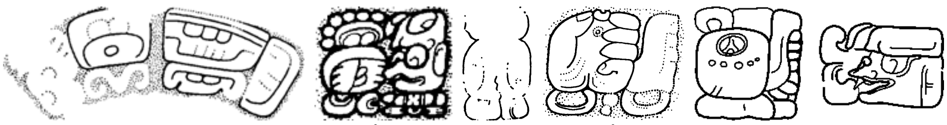
[823] No satisfactory translation can be given for *kin*. Despite the absence of clear cognates on a verbal basis and a disharmonic root spelling, an absolutive antipassive is assumed by morphosyntactic considerations, with *mat*, "merganser duck" as the agent. YUK provides *kin*, "herir" (Barrera Vásquez 1993: 319), but this seemingly would make more sense with *mat* as the patient. Interestingly, the individual's husband, *Tiwol Chan Mat*, carries the same component in his name. We can possibly analyse the first part as the gerund on *–ol* of a putative transitive verb *tiw*.



a

Figure 113: Examples of absolute antipassives with morphographic root spellings. **a) TAN^{na} LAM=wa** (CRN P. 1, V1-U2).

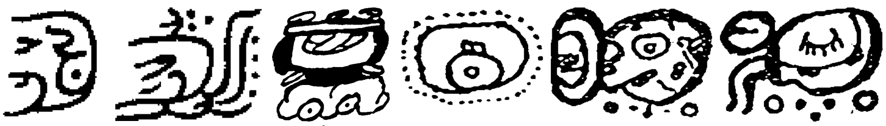
So far, only cases complying to the statistically determined =**wi** ~ =**wa** pattern have been discussed. A limited number of absolute antipassives feature deviating suffixations (Figure 114). Hereby, CaC roots are suffixed by =**wi** and other CVC root by =**wa**, and a rare case of a =**wV**$_{1}$ use. The spelling patterns involved feature integrative syllabic as well morphographic roots. The syllabic spellings support a *–V$_1$w* suffix as well, an equation with other root harmonic suffixes can be conducted with two lexemes (compare Figure 114a with 129a, and 114c with 100h and 103l).



a b c d e

Figure 114: Examples of absolute antipassives with suffix spellings deviating from the standard pattern. **a) jo-lo=wo CHAN^{na}=li** (UXM BSc. 2, S1-T1), **b) ju-su=wa K'AWIL=CHAN=K'INICH** (AGT St. 1, A8)[824], **c) ko-bo=wa** (CPN HS. 1 XXIV, O1b)[825], **d) TZAK=wi=ya** (CRN HS. 3 IV, B3)[826], **e) wa-ma=wi K'AWIL** (COL P. Ballplayer, D1-C2)[827].

Underspellings of absolute antipassives (Figure 115) only appear in a limited context, most notably in nominal phrases (compare Figure 115a with 110b and 115b with 110c). Depending on the root spelling a syllabic or morphographic, the cases classify as scheme 1.g.i with **CV**$_1$**-CV**$_1$**=Ø** for a *CV$_1$C-V$_1$[w]* form, or as 2.g.i with **CV**$_1$**C=Ø** for a *CV$_1$C[-V$_1$w]* form.



a b c

Figure 115: Examples of absolute antipassives with different underspellings. **a) ja-sa t'o?-wa-ni** (TIK MT. 38:B, H2-H3), **b) LAM EK'** (RAZ K5022, B4b), **c) mo-lo ? CHAM=la** (C Dr. 10c2)[828].

[824] It is the only example of this verb, translated as "to plaster" by Boot (2009b: 88). This action carried out by the Dos Pilas ruler *K'awil Chan K'inich* follows the *ka<h>ch-aj-Ø u-say hun* statement (Figure 59f), "bundled up were the covers of the books." We may deal here with the description of how to produce a codex, with the paper sheets being coated with stucco after they have been bound in the leporello folding.

[825] The absolute antipassive is not entirely sure, as the following glyph blocks are very eroded. As it likely contains **CHAN^{na}** with some smaller outlines above, I suspect that block P1 contains the name of *K'ahk' Yipyaj Chan K'awil* as one of the builders of the hieroglyphic stairway. This makes an incorporating antipassive impossible.

[826] Although *tzak* appears with other =**wi** / __# suffixations (see Figure 120m), this example, as well as another incorporating the name of a supernatural (Figure 120n), may specifically utilise =**wi** to provide the vowel of the following enclitic. But this is not necessarily the case (Figure 119c).

[827] No decisive translation can be given for *wam*. CHL provides two reasonable adjectives: *wamal*, "amontonado (muchas cosas)" and *wamlaw*, "turbulento" (Aulie and de Aulie 1978: 106). With corresponding transitive verb roots "to mount up" and "to surge (up)" that may account for an antipassive name involving *K'awil* as the agent.

[828] The example is from the first clause of the almanac, whose other prognostications are all given with a transitive **u=mo-lo** spelling (Figure 103n). As the name of God A follows directly after the predicate, it must be an

In summary, absolute antipassives represent a relatively small portion only. Except the example in Figure 111, Lacadena (2000a) in his seminal study did not further discuss absolute antipassives. The example in Figure 114d was interpreted by him as an agent focused antipassive (Lacadena 2000a: 174), because of the independent pronoun fronting it (Figure 123d). This issue will be discussed below.

To what verbal morphology, phonology and syllabification do the examples point? If the root spellings include a syllabogram spelling or reinforcing the root coda, then it is, with the exception of the two examples in Figure 112, always synharmonic. If the orthography of these roots are compared with their active transitive counterparts, this leads us to conclude that such spellings are used for a full phonemic spelling providing a root harmonic suffix vowel. The =**wa** / CaC ~ =**wi** / CVC < *–*V_1*w* / __# pattern can largely be confirmed, with some exceptions (Figure 114). The allowance of such deviations, together with the historical development of the suffix reconstructed in Chapter 3.1.3.2, also makes it unlikely that the spelling patterns indicate ***–w-a* / CaC__# ~ ***–w-o* / CoC__# ~ ***–w-i* / CVC__#. This also refuses the idea that all ClM absolute antipassives spell out a suffix chain ***–w-i* with the single-argument predicate marker (Houston, Robertson and Stuart 2000: 329)[829]. Likewise, ***–w-a* for all cases of absolute antipassives, as some evidence from the Greater Q'anjobalan branch suggests (Table 44), can largely be denied because of the =**wa** ~ =**wi** alternations, although the antipassive of these languages is functionally closer to ClM than ClM is to modern Ch'olan languages. But their phonology developed in a separate way after they split of the WM branch.

Root transitive verbs therefore derive an absolute antipassive following a *CV*$_1$*C-V*$_1$*w-Ø* paradigm. Such forms regularly syllabify into a canonical bisyllabic *[CV.CVw] word, e.g. *lam-aw-Ø* as *[la.məw]. In comparison with Ch'olan data, it is likely to assume an allophonic variation with the schwa sound with CaC roots. Enclitics among the absolute antipassive are only recorded with one example (Figure 114d). In comparison with the practice from other showcases (e.g. Figure 62), the use of =**wi** despite a CaC root is conditioned by the *=iy* to follow (Lacadena 2000a: 163-164). Picking up the line of evidence used for the inchoative (Chapter 4.1.3), then the =**wi**=**ya** sequence for a simple *=iy* involves a vowel syncope to *–w* / … with any regular CVC root, and the underlying spelling scheme classifies as 2.f.ii. This lets the example *tzak-w-Ø=iy* to syllabify into a canonical bisyllabic form *[t͡sak.wij], or generally a *[CVC.wij] segmentation.

Object incorporating antipassives are far more abundant in the epigraphic record. Their orthographic realisation needs to separately be determined before being compared to the absolute antipassive. The number of CaC roots with integrative spellings (Figure 116) is relatively small. With a synharmonically spelled root, the process of spelling is **Ca-Ca / CaC**$^{\mathbf{Ca}}$ > **Ca-Ca=wa / CaC-Ca=wa** as a

absolute antipassive. Among the transitive cases, the deity names also follow directly, indicating that the patient is unreferred to. This still does not elide the possibility that in this case, **u**= is underspelled.

829 Alternations of a derived intransitive thematic following an ECh pattern, as for example theorised in footnote 654, can likely be excluded. While we have such *–i* suffix with object-incorporation in CHR (see footnote 324), the underlying morphology is different. Thematic suffixes are not attested with any Ch'olan antipassive form, and the linguistic discussion in Chapter 3.1.3.2 found no reason to reconstruct it for pGT and subsequent stages up to ClM.

scheme 1.a.i spelling for a *CaC-aw* form. In terms of the root synharmony relevant for the suffix vowel, the spelling of *jas* is identical to the absolute antipassive (Figure 110a-b), and several other lexemes can also compare to other diatheses (compare Figures 116c with 103m, 116d with 50k and 99i, 116e with 99j, and 116f with 50s and 99n). Most cases (at least those illustrated in Figure 116) clearly separate by graphotactics the derived antipassive from the incorporated object.

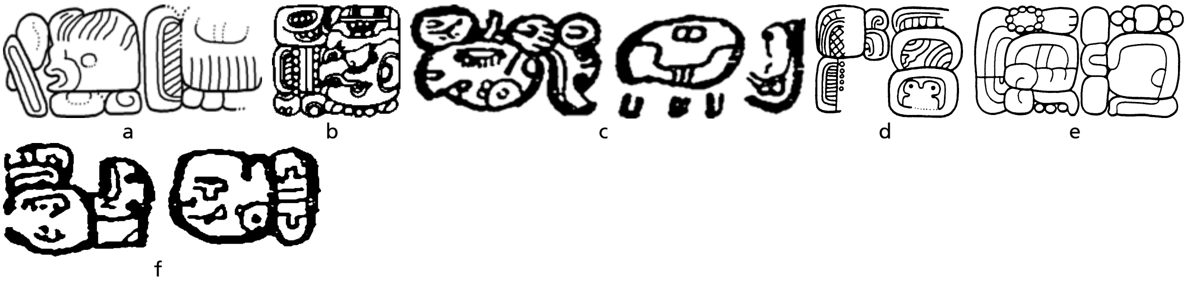


Figure 116: Examples of incorporating antipassives with integrative CaC roots. **a) CH'AK-ka=wa ka-ba** (SBP HS. 1 I, A33-A34), **b) ja-sa=wa CHAN K'AWIL** (TIK T. 4 Lnt. 3, H8), **c) ma-k'a=wa WAJ^{ji}=ja** (C Dr. 14b1), **d) pa-sa=wa u=KAB=CH'EN** (QRG Mon. 26, C5-D5), **e) i PAT-ta=wi u=KUCH=TUN^{ni}** (QRG Alt. M, A4-B4), **f) tz'a-pa=wa cha-ki** (C Pa. 3c).

Cases of other CVC roots incorporating an object (Figure 117) are all of supposed root synharmonic spellings that is retained as a 1.a.ii scheme with **CV_1-CV_1 / $CV_1C^{CV_1}$** > **CV_1-CV_1=wi / CV_1C-CV_1=wi** for a *CV_1C-V_1w* form. Along the attested lexemes, a root harmonic suffix vowel cannot be supported by comparison with other vowel harmonic suffixes or different diatheses, as such cases are not attested in the corpus. But at least the spellings for *uk'* support vowel harmony in comparison with the regular spelling alterations for the instrumental (compare Figure 117d with 145b). At least the illustrated cases draw a clear graphotactical separation between the verbal from and the incorporated object.

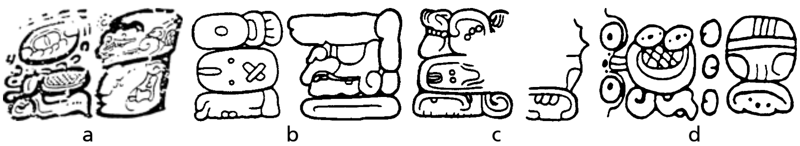


Figure 117: Examples of incorporating antipassives with integrative other roots. **a) ju-tu=wi CHAN^{na}** (EKB M. 96G, H1-I1)[830], **b) ti-li=wi CHAN^{na}** (QRG St. J, H6b-G7), **c) TIL-li=wi CHAN^{na}** (QRG St. J, E7b-F7a), **d) u-k'u=wi ^{cha}CHAN^{na}** (DBC Str. 42 Femur, A3-B3).

Only one example of an incorporating antipassive actually is a non-integrative spelling (Figure 118), classifying as scheme 2.b.i. The root is supposed to be synharmonic, but only attestations at a C.C morphemic boundary are known (Figures 106e and 126e). The reason for the assumed spelling change

[830] Proposed translation for *jut*: "to ruin, to demolish". It is based on YUK *hut*, "demoler, desmoronar, derribar cosas sobrepuestas, arminarlas" (Barrera Vásquez 1993: 258). No Ch'olan evidence is found, but the provenance actually supports a lexical vernacular, despite the Ch'olan antipassive derivation. The attested examples originate from the nominal phrase of *Chak Jutuw Chan Ek'*, which can be translated as "Big is the Sky-Demolishing Star".

CV$_1$-CV$_1$ > **CV1-CV$_2$=wa** (even with a deviant suffix pattern) for a *CV$_1$C-[V$_1$]w* form is unknown. The incorporated object follows the intransitivised verbal form.

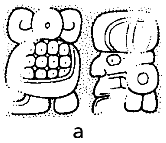


Figure 118: Examples of incorporating antipassives with non-integrative root spelling. **a) yu-ko=wa ?** (PUS St. E, Dp9-Cp10)[831].

With the significant amount of group 2 spelling among the showcase, it is not surprising to find most samples of incorporating antipassives with just a morphographic root (Figure 119). The lexical variety of the verb is rather small, with most examples pertaining to *ch'am* (Figure 119b-f) and *k'al* (Figure 119g-i), while the object may vary depending on the occasion and context. Depending on the root vowel, the samples classify as schemes 2.e.i or 2.e.ii, if following the standard **CaC=wa** ~ **CVC=wi** pattern for a *CV$_1$C-[V$_1$]w* form. A lot of the lexemes involved among these examples are hand signs, where the incorporated object can be superimposed on the subgraphemic 'placeholder' space of the hand sign (e.g. compare Figure 119b-c with 119d-f or 119g-h with 119i). The underlying representational rules have already been discussed by Lacadena (2000a: 162, fig. 2).

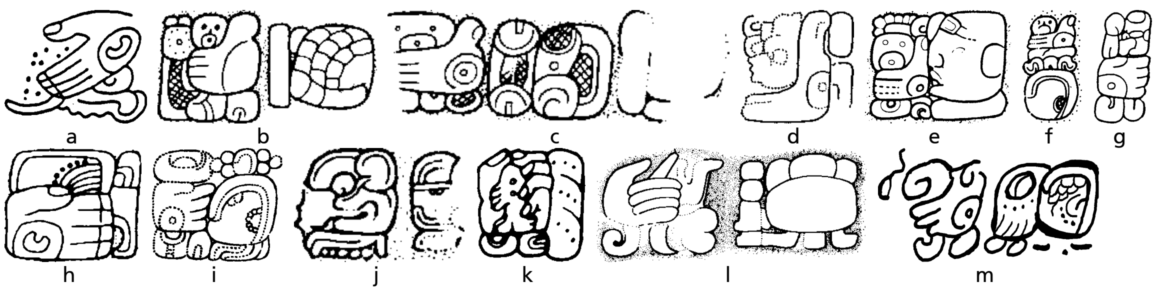


Figure 119: Examples of incorporating antipassives with morphographic root spellings. **a) CHOK=wi CH'AJ** (RAZ Jd. Celt 2, B6b), **b)** $^{\mathbf{ch'a}}$**CH'AM=wa 5=KOHAW** (PNG P. 2, H1-G2), **c) CH'AM=wa=ya ko-o-ha-wa** (PNG P. 2, O2-Q1), **d) CH'AM=wa K'AWIL** (MTL St. 4, pE5), **e) CH'AM=wa K'UH AJAW=le** (SBL Str. A-14 T6, G'1), **f) CH'AM=wa tzi-ku** (CPN St. J, A3b), **g) K'AL=wa HUN** (QRG Alt. O', M1a), **h) K'AL=wa TUN** (TIK St. 31, F16), **i) K'AL=wa KUCH=TUN**$^{\mathbf{ni}}$ (PNG Alt. 1, H'2), **j) TIL=wi CHAN**$^{\mathbf{na}}$ (NAR St. 23, H19b-G20a), **k) TZAK=wa K'UH** (PAL TS, O13), **l) TZUTZ=wi=ya 2 WINIKHAB** (TIK St. 9, A1-A2)[832], **m) ya-AL=wa ba-ku=la** (COL K2213, C1-D1).

The samples discussed so far adhere to the statistically determined =**wi** ~ =**wa** pattern, while there are also deviations observable (Figure 120). As the absolute antipassive, cases of object incorporation also feature a reversal of the standard pattern to =**wi** with CaC roots and =**wa** with other CVC

[831] The antipassive is followed by two blocks with unclassified supernatural head variants. I assume that the first of them is the incorporated object, while the second refers to the actor.

[832] This case can with all likelihood be interpreted as an incorporating antipassive by comparison with passive (Figure 56m), transitive (Figure 101k), and mediopassive (Figure 128p) examples. Here, the time period is always the semantic patient. But the form can also be interpreted in favour of an absolute antipassive, which would make time itself the agent to plant/sow the period ending (see footnote 730).

roots, along some rare cases of =**wV**$_1$ (Figure 120e). Involved are integrative as well as morphographic spellings, which classify as schemes 1.a.ii and 2.e.ii.

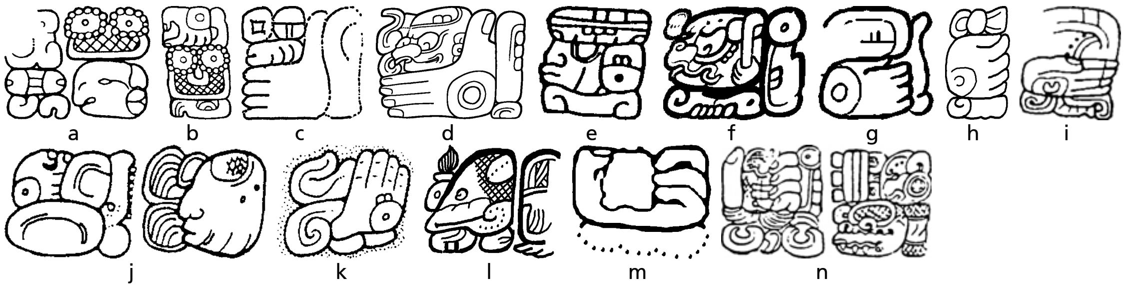


Figure 120: Examples of incorporating antipassives with suffix spellings deviating from the standard pattern. **a) CHOK-ko=wa ch'a-ji** (QRG Alt. P', I1), **b) CHOK=wa ch'a-ji** (QRG St. E, B17b), **c) CH'AM=wi AJAW=le** (PRU St. 27, E1), **d) CH'AM=wi K'AWIL** (CLK Frg. 37, A2), **e) 5-lo=wo CHAN**$^{\mathbf{na}}$ (QRG Str. 1B1-1, Q1b)[833], **f) KAL=wi TE'** (CUY Vessel, R4)[834], **g) K'AL=wi HAB** (AGT St. 16, B2), **h) K'AL=wi HUN** (CRN St. 1, pE13b), **i) K'AL=wi TUN** (TIK St. 31, D9), **j) PAS=wi ka-ba** (PMT Jmb. 3, B6-B7)[835], **k) PUK=wa K'AK'** (PUS St. H, A9), **l) ti-li=wa CHAN**$^{\mathbf{na}}$ (NAR K1398, 10), **m) TZAK=wi** (QRG Zoo. P, R2b)[836], **n) TZAK=wi=ya 18=u=BAH CHAN**$^{\mathbf{nu}}$ (CPN St. 6, C5-C6).

The examples illustrated may give the impression that such deviations (also in Figure 114) are abundant, but their detailed description is simply qualitative. For example, from 36 antipassive samples with *ch'am*, only 5 do not use the expected =**wa** / __#, but =**wi** / __#. But such deviations are not more than that: the syllabograms may freely alternate at a low level, as e.g. visible with *chok* (Figure 119a and 120a-b) or even in the same text with *k'al* on TIK St. 31 (Figures 119h and 120i). Some of the incorporating antipassives also feature a deictic enclitic *=iy* (Figures 119l, 120n) that may lead the syllabogram indicating the antipassive to deviate.

There are however some interesting observations: of the 13 samples of *chok* (most are object-incorporating), only 3 use the expected =**wi** / __#. All 4 samples of *jol* rather use a synharmonic =**wo** / __#, although all post-date 9.17. However, the relative stability in the suffixation pattern is also good support that synharmonic suffix patterns are not necessarily a Late Classic phenomenon (Houston,

833 Note the use of the head variant **JO'** to substitute for **jo** and that the Str. 1B-1bench twice uses an antipassive form of *jol*, otherwise the name is spelled **K'AK' jo-li CHAN**$^{\mathbf{na\text{-}ni}}$ **YOP=AT**$^{\mathbf{ti}}$ (QRG St. I, A8-B8) or **K'AK' jo-lo=ya CHAN**$^{\mathbf{na}}$ **YOP=AT**$^{\mathbf{ti}}$ (QRG St. K, A7-B7a). These alterations among *jol*, "to open" are quite opaque. The first may involve a nominalised *jol-i*, possibly spelling out the assumed *–i* nominaliser. The second is considered a mediopassive derivation (see Figure 129a).

834 The three examples of this spelling might be an alternate spelling for the *kalomte'* title (Christophe Helmke, personal communication, February 25, 2011). Similar image captions as on the Cuychen vessel (Helmke et al. 2012: fig. 7) appear on other Holmul dancer vessels, e.g. K8966. There, the spelling is only **KAL=TE'**. Wagner (1995) in her discussion considers the *kalomte'* title to refer to God B wielding the axe to produce lightning that may hit trees. An incorporating antipassive *kal-[a]w-te'-Ø*, "he tree-splits" would semantically be identical to *kal-om+te'*, "tree-splitter" as the agentive. Alexandre Tokovinine (written communication, February 25, 2014) suggested that the Maize God dancers do what the antipassive describes in the localities specified in the texts: they chop trees, either to clear the *milpa* for sowing or for the foundation of the places (David Stuart, written communication, February 25, 2014. This nuance might explain the different suffixation. However, other etymologies of the title are also possible (Gronemeyer 2013: fn. 14).

835 Bíró (2011a: 286) reads the root as *k'al*, likely because of the representation of a hand. But a similar, less eroded expression (Figure 62j) makes it clear that it is indeed the grapheme MZ2.

836 The blocks following the antipassive are badly obliterated, but I assume the name of the supernatural being conjured follows. Compare to the example in Figure 120n, but there are also absolute cases of *tzak*, see Figure 114c.

Stuart and Robertson 1998: 284-285, 291-292, Lacadena and Wichmann 2004: 115-116). And with =**wa** / CaC__#, a deliberate synharmony appears as early as 9.0 on TIK St. 31.

Another sort of deviation are the underspellings of the suffix among object incorporating antipassives (Figure 121) that almost exclusively appear in the Dresden Codex, at least as long the antipassive does not appear in an abbreviatory nominal phrase (compare Figure 121c with 117b). Such forms either appear as a 1.g.i scheme for an underlying $CV_1C\text{-}V_1[w]$ form with $\mathbf{CV_1\text{-}CV_1{=}\emptyset}$, or as 2.g.i with $\mathbf{CV_1C{=}\emptyset}$ for a $CV_1C\text{-}[V_1w]$ form.

The cases of the Dresden Codex can well be drawn upon the statistical relevance for passive and root transitive spellings (Chapter 3.3.6.2) and seem to be part of the 'codical scribal school(s)' (see footnote 794). As these cases can only be explained by Ch'olan morphology, there is little doubt that the antipassive is realised by the ClM pattern, but other explanations are possible[837].

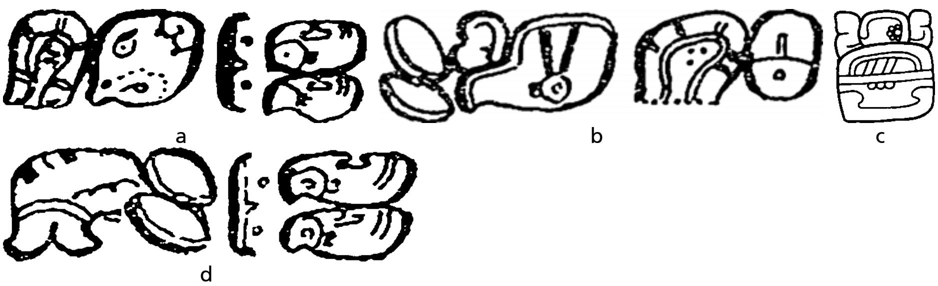
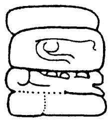


Figure 121: Examples of incorporating antipassives with different underspellings. **a) jo-ch'o u=chi-chi** (C Dr. 5b2), **b) nu-chu jo-lo** (C Dr. 8b1), **c) TIL CHAN** (QRG St. C, D13b), **d) tzu-nu u=chi-chi** (C Dr. 7b1)[838].

Antipassivation of derived transitives verbs is obviously possible, but was apparently not a common or at least preferred process, as there is only one potential example attested (Figure 122). The root is unfortunately spelled by a morphograph, so no indication of the stem-formative vowel is provided. For indicative derived transitives (Figure 105), we have evidence for the *–V* vowel, and more importantly, the abundant cases of these verbs in perfect aspect (Chapter 4.1.19). Here, the $–V_1j$ suffix is assimilated to *–Vj* by the transitiviser, and despite epigraphic evidence, I assume the same, hence derived transitives may form a $CV_1C\text{-}V_2w$ antipassive (and occasionally $V_1 = V_2$, as in the *kab-[a]w-?-Ø* of Figure 122).

[837] Two objections can be made, at least for some examples: (1) We deal with nominal compounds (see Chapter 4.1.9), where the nominalised transitive root takes the predicative position, and the subject is a possessive phrase, e.g. *joch'-Ø-Ø u-chich akan* (Figure 121a), "drilled (is) the prognostication of *Akan*." It is only possible when the 'object' is possessed, which happens to be the case with all samples of *joch* and *tz'un*. The case in Figure 121 can only be an antipassive by its full context: *nuch-u[w]-jol-Ø itzam-tzikin?*, "God D head-joined." (2) Alternatively, these forms are pYu antipassive form, reflecting –Ø [+INC] (Table 42). As there is firm evidence only for completive Yukatekan vernaculars (see Chapter 4.3.4.1), this possibility is less likely, although different almanachs may be written in varying aspects.

[838] These cases are analysed as an antipassive of a transitive root *tz'un*, based on the YUK attestation *ts'unul*, "comenzarse" (Barrera Vásquez 1993: 893). Compare to other 1.g.i antipassive forms in the Dresden Codex. Grube (2003) alternatively considers YUK *ts'unum*, "contento y muy alegre por algún suceso" in a stative phrase: "fair (is) the prognostication of NN."



a

Figure 122: Examples of *–Vw* antipassives with derived transitive verbs. **a)** **^{ka}KAB=wi ?** (QRG Alt. P', Q1)[839].

The observations regarding the phonology of the suffix vowel and the underlying semi-constant suffixation pattern is the same as with absolute antipassives. Both function therefore share the common set of $–V_1w$ ~ *–Vw* ~ *–w* allomorphs, which are determined by morphophonemic reasons. Both functions are also related: the absolute antipassive demotes the patient by deletion, the incorporating antipassive by making the patient oblique as part of the verb. Again, the assumption of ***–w-a* ~ ***–w-i* can be rejected on the basis of deviations and underspellings[840].

The reading order of graphemes among incorporating antipassives that Lacadena (2000a: 162, fig. 2) worked out can be confirmed. Likewise, the temporal deictic enclitic, which exclusively is *=iy*, binds to the verbal stem, not the entire expression, as the examples in Figures 119l and 120n demonstrate. The phonology and syllabification of the verbal stem into bisyllabic *[CV.CVw] and *[CVC.wij] forms remains the same. While the incorporated object becomes part of the verbal morphology, phonologically it is subject to its own syllabification.

The basic morphosyntactic paradigm is VER.TR-ANTIP-NOUN-3SG.ERG, e.g. *chok-ow-ch'aj-Ø*, "he droplets-scattered". With temporal anteriority indicated, it is VER.TR-ANTIP=TEMP-NOUN-3SG.ERG, such as in *tzutz-w=iy-cha'-winikhab-Ø*, "he 2-*K'atun*-completes." The latter shows that the incorporated object can be more complex than a simple CVC root or a single substantival root, here with a numeral. In the initial study, Lacadena (2000a: 162) does not account possessed object, nor deem them possible, and even beyond the otherwise interpretable cases of Figure 121, there are undoubted attestations (Figure 116d-e). Other instances provide compounded nouns (Figure 119e, i, l) as the incorporated object, as well as nouns marked for status or derivation (Figures 116c, 119m, 120c), e.g. *ch'am-[a]w-ajaw-le[l]-Ø*, "he kingship-grasped." Finally, an entire nominal phrase can be incorporated (e.g. Figure 120n). This construction shows the fundamental difference to nominalised compounds[841].

To conclude the discussion of antipassives on $–V_1w$, the few cases that are preceded by an independent pronoun (Figure 123) need to be considered. Are these indeed evidence for a blurred use of agent-focusing antipassives (Chapter 4.1.11), as Chapter 3.1.3.2 implies? The grammars testify that the

[839] A comparison with close-up photographs makes this the most likely reading, also in comparison with the preceding independent pronoun (Figure 123a). The eroded sign underneath the **=wi** suffix is considered as the incorporated object. Directly after follows, in some unusual reversal of personal name and titles, *chuwen k'uh un ajaw ba[h] kab chan til yopat* (QRG Alt. P', Q2-R1).

[840] With a 1.g.i scheme such as **nu-chu** in Figure 121b, a suffix vowel is provided: *nuch-u[w]*. This is in accordance with the analogue cases among the showcases 1PASS or 2IND. If the suffix were ***–w-V*, the underspelling would need to provide the whole suffix sequence. Although such abbreviatory cases are rare, they are one mosaic stone in favour of a $–V_1w$ suffix.

[841] A compound (Chapter 4.1.9) with a nominalised verb requires an ergative pronoun to bind the syntactic and semantic agent: "it (is) the object-doing of him/NN." If the object is incorporated, following the verbal stem, the absolutive pronoun of intransitive verbs morphosyntactically binds the agent.

patient of an agent-focusing antipassive can be demoted, but does not need to. Are the cases therefore still absolute or incorporating antipassives?

The reconstructed evolution of antipassive forms and functions relies on the innovation of an absolute *–*Vw* antipassive in pGT at latest. Footnote 336 discusses further shifts of agentive functions via Tzeltalan as the result of innovations in the 'Huehuetenango sphere' at around 500 AD. Inferences should thus not appear earlier, if the linguistic reconstruction is correct. The –V_1w suffix for the absolute and incorporating antipassive is attested from 9.0 (435 AD) in ClM, lasting into the codices. The earliest of the supposed 'agentive' cases all postdate the assumed diffusion, between 9.13 and 9.19 (692-810 AD). Their provenance is also scattered, no site is even close to the 'Huehuetenango sphere'. We also have isolated cases of a topicalised agent with other verb forms (Figures 100b, 175), and likewise agentive antipassives without a topicalised agent (Figure 125), to be further discussed in Chapter 4.1.11. Lacadena (2012: 51-52) tries to explain such emphatic constructions with the rhetoric device of a hyperbaton, implying that it is a legitimate change in word order not necessarily conditioned by an agentive antipassive.

The question is therefore not only subject to a morphological and functional differentiation, but also a matter of syntactics. We may rather deal with a certain way to indicate relative clauses. This study cannot deal with a full discussion of complex sentences, but only propose to equate certain observations from other descriptions of Mayan languages with ClM: (1) the relative clause is gapped, no relativiser is used; (2) it follows an existential construction, either an independent pronoun or a head noun; (3) it features a finite verb form and a regular syntax[842], which regularly is a detransitivised form (e.g. Dayley 1990). See footnote 351 for some examples, including cases of proper object-incorporation, as e.g. also in Figure 123c as *ha[']-i-Ø pas-[a]w-kab-Ø chak ich'ak ek'*, "it (was) him, *Chak Ich'ak Ek'*, who earth-opened." Antipassive name phrases (see footnote 356) with a nominal head seem to involve a relative clause as well[843]. Therefore, the view that only (or mostly) –*Vn* is subject ex-

[842] For a typological description of relative clauses, refer to Comrie (2006: 138-164); and to Stiebels (2006) for a recent comparative approach of Mayan agent focusing constructions, less under a morphosyntactic, but a typological view. Besides short descriptions in the corresponding grammars cited in Chapter 3.1.3.2, only few of them as well as additional studies have specifically dealt with relative clauses in Mayan languages, such as YUK (Gutiérrez-Bravo 2012, 2013, Gutiérrez-Bravo and Monforte 2011), and notably POP (Craig 1977: 191-210). Critique on the 'antipassive' nature of agent focus was already raised (Tonhauser 2003: 540-541), as antipassives do not inevitably result in patient demotion in certain Mayan languages, and apparently also not in ClM (cf. Hull, Carrasco and Wald 2009: 38-40). Also refer to Chapter 4.1.11.

[843] Colas (2004: 110) interpreted the first element in names such as *K'ahk' Tiliw Chan Chahk* as an adverb, as it cannot be the topicalised agent of an antipassive. I agree about the last statement, but a noun cannot derive into an adverb. Although the determination of the syntax would still require a more thorough review, the analysis can be conducted as *k'a[h]k'*-$Ø_{\text{PRED}}$ *til-iw-chan*-$Ø_{\text{PRED}}$ *cha[h]k*$_{\text{AGENT}}$, "It (Is) Fire what *Chahk* Heaven-Drills", with a stative head noun and the relative clause, in which the 3SG.ABS of the verb binds the agent of the relative clause. This is different to the case of Figure 123c, where additionally the 3SG.ABS of the fronted cleft expression cross-references the agent in the relative clause, *Chak Ich'ak Ek'*. The analysis of names with a head noun relies on the analysis of an incorporating antipassive. Following Colas (2004: 108), the structure of such names is always NOUN + ANTIP + *chan* + *theonym* (note that the head is not always *k'ahk'*). As an incorporating antipassive, the 'heaven-doing' might refer to actions a deity conducts in the heavens that involve fire, so an instrumental sense is inherent in the construction: *K'ahk' Jolow-Chan Yopat*, "It (Is) Fire what *Yopat* Heaven-Opens" (i.e. *Yopat* who opens the heaven *with* fire), *K'ahk' Xe'ew?-Chan K'awil*, "It (Is) Fire what *K'awil* Heaven-Vomits" (i.e. *K'awil* who pukes all over the heaven *with* fire), *Chak Jutuw-Chan Chahk*, "It (Is) Big what *Chahk* Sky-Destroys" (i.e. *Chahk*

tracting (only for focus?) must be challenged by further reviewing other agreement extraction purposes, such as relativisation or question in ClM.

Figure 123: Examples of $-V_1w \sim -Vw \sim -w$ antipassives with a topicalised agent. **a) ha-i** **[ka]KAB=wi** **?** (QRG Alt. P', Q1), **b) ha-i K'AL=wi TUN[ni]** (PUS St. H, D4-C5), **c) ha-i PAS=wi ka-ba** (PMT Jmb. 3, B5-B7), **d) ha-i TZAK=wi=ya** (CRN HS. 3 IV, A3-B3).

The discussion of the examples exhibits only relatively few cases of absolute antipassives. This may be related to the preferred argument structure (Mora-Marín 2004b: 342) of antipassive constructions. Compare the figures of Mora-Marín's (2004b: 344-351) showcase analysis of selected Palenque inscriptions that prefer verbal forms with one valency. A diathesis as the incorporating antipassive, but also nominal compounding and its intransitivation (Figure 78), is therefore an elegant way to comply with this rhetoric preference. While such a verbal predicate allows two semantic actors, the agent remains the verb's only syntactical argument.

The major insight of the statistical analysis concerning the orthographic patterns is the semi-constant suffixation pattern with **=wi** ~ **=wa** pattern that has decisive impact on several key points. Together with a still considerable set of spellings deviating from this preferred pattern[844], it helps to interpret a small group of vowel-harmonic root spellings (either purely syllabic or by complementation) in favour of providing the suffix vowel, i.e. arguing for a $-V_1w \sim -Vw$ / __# suffix. The comparison of the spelling practices among active root transitive and passive diatheses further supports this phonology in favour of a syncopated form (see footnote 355) with a final stem formative suffix for intransitive verbs, as proposed by several authors (Houston, Robertson and Stuart 2000: 329). The

who destroys the sky *in* a big scale). Sentence names without a head noun reflect a simple sentence with an incorporated object, such as *jasaw-chan-Ø*$_{\text{PRED}}$ *k'awil*$_{\text{AGENT}}$, "*K'awil* Sky-Clears" (which in English paraphrase is best understood with a relative clause: *K'awil* who Clears the Sky"). In relation to the attributive nature of *chan-al k'uh* (see footnote 759), it seems very unlikely that in all these antipassive names, *chan* is attributive to the theonym, which would make the antipassive absolute. There is no instance of a **=la** suffixation. – In relation to the transitive example with the independent pronoun (Figure 100a), I would analyse the full context as follows: *ta[h]n lam-Ø ha['.]-i-Ø u-but'-u-Ø k'inich kan ba[h]lam k'uh mat-wil ajaw*, "the middle-diminished it (was), what *K'inich Kan Bahlam*, the *Matwil* God-Lord filled up" (PAL PT, N10-N12). Here, the patient of *but'*, the nominalised half-period expression *ta[h]n lam*, is topicalised by the independent pronoun. Therefore, a transitive verb is still needed in the relative clause, and thus the otherwise preferred antipassive construction is not an apt way of speech (or it is alternative to agentive antipassives not demoting the object, see Figure 124b, d). Also compare to the causative *ha[']-i-Ø x-aj-es-Ø y-o[h]l ko[k] bak-lib chan e[h]mach* (TRT Mon. 6, L8-L10), "it (is) him, who will awaken the hearts of *Kok Baklib* (and) *Chan Ehmach*", where the transitive agent is extracted and topicalised, while the patient remains with the causative in the relative clause (cf. Gronemeyer and MacLeod 2010: fn. 62).

[844] To itemise the figures from Table 73: 62.5% of samples comply with the suffixation pattern. In relative frequency this does not appear too much, but the total amount is above the lower significance boundary. 21.6% or 45 samples deviate from the standard pattern, with **=wi** / CaC__#, **=wo** / CoC__# and **=wa** / CVC__#. The remaining 15.9% or 33 samples underspell the suffix entirely, mostly within nominal phrases, of which *K'ahk' Tiliw Chan Yopat* of Quirigua alone comprises 11 cases.

orthography and the underlying phonology was proven to be identical along the absolute and incorporating antipassive, therefore largely confirming the initial assumptions made by Lacadena (2000a).

The semi-constant suffixation pattern can also be taken as a major caveat against the morphosyllabic proposition. Under consideration of their third property, the antipassive would almost call for a 'regular' morphosyllable **WI for a $-V_1w$ suffix (cf. Houston, Robertson and Stuart 2001b: 15-16), making any alternant unnecessary (also see Chapter 3.4.2, section 2a). As the epigraphic evidence would require **WA, this morphosyllable would semantically poach in the domain of the one proclaimed for active transitive verbs. Both would graphemically not be distinguishable, and their different function is more indicated by the underlying verbal diathesis: the pronominal inflection [±ERG]. With the evocation of a syllabic suffix domain, canonical spellings as attested in the inscriptions can be summarised as in Table 82.

This chapter only investigated the particular ClM pattern for absolute and incorporating antipassives. According to the linguistic evidence presented in Chapter 3.1.3.2, all other GLL branches feature a different phonology and do not comply to the showcase. But firm evidence for any vernacular antipassive is scant, possible occurrences in the Dresden Codex (footnote 837) are extremely uncertain, another potential example are discussed in Chapter 4.3.4.1 (and the ECh *–m-a* in Chapter 4.1.1).

Type	Transcribed Paradigm	Canonical Spelling
-ANTIP	$CV_1C\text{-}V_1w\text{-}Ø$	**$CV_1\text{-}CV_1$=wi / $CV_1C\text{-}CV_1$=wi**
(absolute)		**$CV_1\text{-}CV_1$=wa / $CV_1C\text{-}CV_1$=wa**
CVC	*CaC-aw-Ø*	**Ca-Ca=wa / CaC-Ca=wa**
VER.TR.R		**Ca-Ca=wi / CaC-Ca=wi**
	$CV_1C\text{-}V_1[w]\text{-}Ø$	**$CV_1\text{-}CV_1$**
	$CV_1C\text{-}[V_1]w\text{-}Ø$	**$CV_1\text{-}CV_2$=wi / CV_1C=wi / CV_1C=wa**
	CaC-[a]w-Ø	**CaC=wa / CaC=wi**
	$CV_1C[\text{-}V_1w]\text{-}Ø$	**CV_1C**
	$CV_1C\text{-}w\text{-}Ø\text{=}iy$	**CV_1C=wi=ya**
-ANTIP	$CV_1C\text{-}V_1w\text{-}_{\text{PATIENT}}\text{-}Ø$	**$CV_1\text{-}CV_1$=wi=… / $CV_1C\text{-}CV_1$=wi=…**
(incorporating)		**$CV_1\text{-}CV_1$=wa=… / $CV_1C\text{-}CV_1$=wa=…**
CVC	$CaC\text{-}aw\text{-}_{\text{PATIENT}}\text{-}Ø$	**Ca-Ca=wa=… / CaC-Ca=wa=…**
VER.TR.R		**Ca-Ca=wi=… / CaC-Ca=wi=…**
	$CV_1C\text{-}V_1[w]\text{-}_{\text{PATIENT}}\text{-}Ø$	**$CV_1\text{-}CV_1$=…**
	$CV_1C\text{-}[V_1]w\text{-}_{\text{PATIENT}}\text{-}Ø$	**$CV_1\text{-}CV_2$=wi=… / CV_1C=wi=… / CV_1C=wa=…**
	$CaC\text{-}[a]w\text{-}_{\text{PATIENT}}\text{-}Ø$	**CaC=wa=… / CaC=wi=…**
	$CV_1C[\text{-}V_1w]\text{-}_{\text{PATIENT}}\text{-}Ø$	**CV_1C=…**
	$CV_1C\text{-}w\text{=}iy\text{-}_{\text{PATIENT}}\text{-}Ø$	**CV_1C=wi=ya=…**
-ANTIP	$CV_1C\text{-}[V]w\text{-}Ø$	**CV_1C=wi**
CVC-V		
VER.TR.D		

Table 82: Morphological paradigms and canonical spellings of antipassives.

4.1.11 – Antipassive Suffixes $–V_1n$ ~ $–Vn$ ~ $–n$

Examples of the so-called agent-focusing antipassive on $–V_1n$ have not systematically been sampled, as it is not part of the showcases. But at least some cases are apt to be discussed for a couple of reasons. The linguistic hypotheses (Chapter 3.1.3.2) indicate parallel morphophonemics for the suffix vowel, so an excursus to some spelling patterns might further contribute to the vocalisation of the absolute and incorporating antipassive. A functional comparison is also worth a short consideration, especially as the traditional ‘antipassive’ view has recently been challenged by a more thorough investigation of clefting and relative clauses (see footnotes 842 and 843).

In its function to focus the actor, the $-V_1n$ antipassive is expected to appear fronted with a cleft expression (Figure 124), usually the independent pronoun. Such constructions in ClM have recently been scrutinised (Hull, Carrasco and Wald 2009), but questions regarding the patient remain open in comparison with other antipassive constructions (Figure 123). In the example of Figure 123c, we clearly have actor focus: *ha[’]-i-Ø pas-[a]w-kab-Ø chak ich’ak ek’*, “it (was) him, *Chak Ich’ak Ek’*, who earth-opened”, but with an incorporating antipassive. In cleft constructions cross-referencing the agent by the independent pronoun, patient demotion is facultative, so the antipassive may still keep the object that is not incorporated. Only one assumption made in Chapter 3.1.3.2 based on the current state of research can clearly be rejected: the variability between $-V_1w$ and $-V_1n$ is not determined by the verbal class, as Lacadena favoured (2000a: 174) by interpreting his sample set.

The phrase *h-in pat-bu-n-Ø=iy* JAGUAR.THRONE, “it (was) me who shaped the ‘Jaguar Throne’” (Figure 124e) was discussed in detail by Hull, Carrasco and Wald (2009: 38). Other examples without patient demotion are of a similar construction: *ha[’]-i-Ø pikul joy-n-Ø=iy ajaw*, “it (was) him who invested many lords” (Figure 124c) or *ha[’]-ob pas-n-om-Ø way mak-n-om-Ø way*, “it (is) them who will open the ‘portal’ and will close the ‘portal’” (Figure 124d). Instead of the independent pronoun, the actor itself can be focused, as in Figure 124b: *ak’ab?-chit-Ø il-[a]n-Ø yax chit ta[h]n ba[h]lam ajaw*, “it (was) *Ak’ab Chit* who saw *Yax Chit* amidst *Bahlam Ajaw*.” Cases with a non-demoted patient can be viewed as double absolutive constructions, attested in other non-Mayan languages (cf. Primus [1999: 248] for examples). An example of patient demotion is Figure 124a: *ha[’]-i-Ø il-n-Ø=iy*, “it (was) him who saw it.”

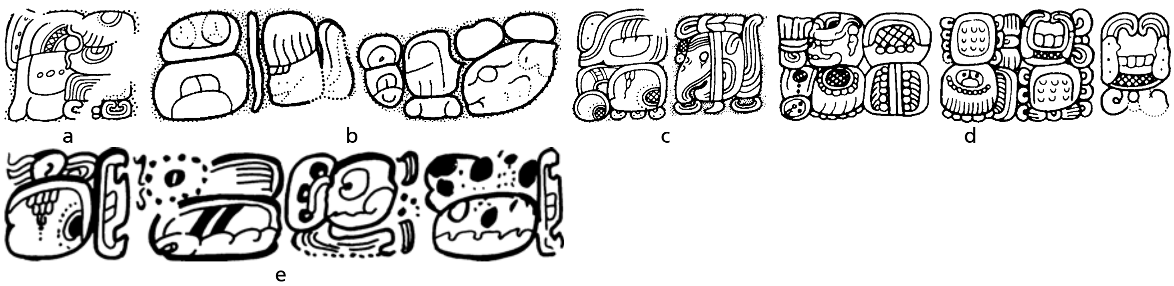


Figure 124: Examples of $-V_1n$ ~ $-Vn$ ~ $-n$ antipassives with a topicalised agent. **a) ha-i IL=ni=ya** (PMT Mon. 11, Bp3), **b) AK’AB? CHIT IL=ni YAX CHIT TAN^{na} BALAM AJAW** (TRT Mon. 1, B2), **c) ha=i pi-ku-la JOY=ni=ya AJAW** (TRT Mon. 6, L3-K4), **d) ha=o-ba pa-sa=no=ma WAY^{ya} ma-ka=no=ma WAY^{ya}** (CPN St. A, D10-D12a), **e) hi-na PAT^{ta}=bu=ni=ya JAGUAR.THRONE^{na}** (NAR K1398, B4-A6).

Further confusion regarding the morphology of antipassives has been raised by those cases that do not have the agent topicalised (Figure 125), lacking an independent pronoun for cross-reference, but occasionally appear with a patient and/or a named agent (e.g. Figure 125g). This seems counter-productive to the obligatory purpose of antipassivation, as "[p]atient demotion is the epiphenomenon of agent promotion" (Primus 1999: 249), as patient promotion is obligatory for passivation.

Lacadena (2000a: 170) confessed that such instances are "less clear" in their syntax. With his underlying linguistic model, Mora-Marín (2001: 271, fig. 8.6c) assumes that some Late Pre-Classic texts feature a genuine absolute or incorporating antipassive on ***–(V)n* (see footnote 352 for examples), and supposing such a form to percolate back into ClM as a vernacular feature at a later phase, being the result of the semantic reinterpretation in the 'Huehuetenango sphere.' The time frame of the examples is roughly between 9.5 and 9.18 (534-790 AD). Although the earliest examples are close to the linguistically proposed time ~ 500 AD, they are again rather scattered.

The nature of these construction cannot be answered with certainty at the moment. Some could possibly be the result of polysemantic allomorphs and reflect an occasional morphological blur in ClM. Mora-Marín (2001: 91-92) supposed the induction by spoken vernacular forms as the result of language change, as assumed on the basis of Lacadena's work. Other cases with a deleted patient may indeed reflect a Ch'olan absolute antipassive *–on*, although only one spelling is solid support (Figure 202b). The absence of a focused agent might also be indication of a special clause type or structure that hitherto is unrecognised.

Figure 125: Examples of *–V_1n ~ –Vn ~ –n* antipassives without a topicalised agent. **a) CH'AM=ni=ya AJAW=le** (CRN P. 1, P8), **b) K'AL=ni TUN^{ni} ba KAB ?** (NSY St. 1, B9b-A10), **c) IL=ni YAX MIHIN^{na} CHAN KAB ? K'INICH WAW?** (TIK MT. 217, D1-G1)[845], **d) IL-la=ni IK' MIHIN CHAN KAB ? K'INICH WAW?** (TIK K3642, M1-Q1), **e) i PAT=ni** (CPN Alt. S, I1a), **f) TZ'AK=bu=ni=ji** (CPN St. 49, Dp2), **g) ^{u}UK'=ni ti-ka=la ^{2}ka-wa K'AN AK** (PNG P. 3, P1-Q1).

Another function of the agentive antipassive is the intransitivation of verbal roots in order to derive an agentive expression on *–om* (Figure 126). As it was already discussed in Chapter 3.1, nominalisations of transitive roots regularly require intermediate intransitivation (see Chapters 4.1.17 and 4.1.18). These agentives can appear as epithets (e.g. Figure 126c) or as part of a referential name (Figures 126d-e). They also can act as a stative predicate (Figure 126b).

[845] This phrase is preceded by an incorporating antipassive *k'al-[a]w-tun-Ø* in block C1 and includes the name of 'Animal Skull', the 22nd ruler of Tikal (cf. Guenter [2002: 303-307] for the reading proposal). The meaning of *the yax mihin chan kab ?* and *ik' mihin chan kab ?* in Figure 125b must remain opaque.

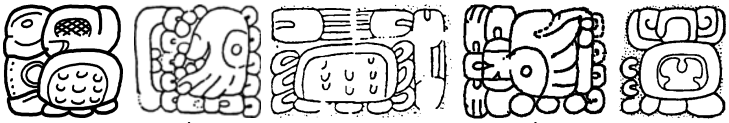


Figure 126: Examples of *–n* antipassives used in nominalisations. **a) a-k'a=no=ma** (PAL TI-W, C6), **b) u=CHOK=no=ma CH'AJ** (CPN Mon. 157, C1)[846], **c) ko-ko=no=ma** (CPN T. 11 WDSP, C5)[847], **d) K'INICH TZUTZ=no=ma** (CPN Alt. G, C3), **e) yu-ku=no=ma CH'EN** (TZB Mon. 11, B3).

The spellings are of little comparative value for the *–V_1w* suffix. Unlike the absolute and incorporating antipassive, the 'true' agent-focusing form (Figure 124) almost exclusively appears with the temporal deictic enclitic. Here, spellings with =**nV** / … indicate a syncopated to *–n* suffix to ensure a bisyllabic form, e.g. *joy-n-Ø=iy* for *[xoj.nij]. The only case of a regular form is the 2.e.i spelling **IL**=**ni**, which can be reconstructed with a *–Vn* suffix as *il-[a]n*, mirroring the stem-formative for a bisyllabic *[ʔi.lan]. It is supported by the **IL-la**=**ni** spelling in Figure 125d and the causative **TZ'AK**=**bu**=**ni**=**ji** < *tz'ak-b-un-Ø=ij=i[y]* in Figure 125f, where *–V_1n* assimilated to *–Vn*. But a regular *–V_1n* suffix with root transitives can be assumed by comparison, apparently indicated by a constant =**ni** / __# spelling. This survey confirms and enhances the observations made by several authors (Hull, Carrasco and Wald 2009, Lacadena 2000a: 166-170). The question regarding the historical configuration especially of the agent-focusing antipassive remains dubious and requires more research.

4.1.12 – Mediopassive Suffix *–V_1y ~ –Vy ~ –y*

As discussed in Chapter 3.1.4.1, only modern CHL still yields productive evidence of a *–V_1y-i* intransitiviser of mediopassive function. Here, *–i* functions as the status marker [+COM], whereas I consider its presence in ClM to relate to the ECh thematic of derived intransitives. As the statistical analysis of the suffixation pattern (Table 73) demonstrates, the =**yi** / __# pattern has one of the strongest preponderances among all showcases, and is only affected in its significance by the 11.1% of underspellings that mainly originate from formulaic PSS contexts. In contrast to the =**wi** ~ =**wa** pattern of antipassives (Chapter 4.1.10) that has been considered to possibly represent a ***–(V)w-i* suffixation, the pattern is much more uniform with =**yi**. Also, the linguistic evidence for a thematic *–i* suffix stands on firmer ground for the mediopassive. The graphematics, morphology, and morphophonemics of the suffix are also relevant to delimitate it from similar suffixes. The time depth of the mediopassive is also relevant for its historical configuration within the Ch'olan branch, together with other *–Vy* forms; also in a broader pGT perspective.

The spelling pattern distribution (Chapter 3.3.3.4.1) also indicates an extremely strong preponderance of non-integrative, morphographic root spellings. The burden to carve out the phonology of the mediopassive suffix lies on a relatively small number of integrative spellings following the standard =**yi** / __# pattern (Figure 127). As no CiC roots are attested with the mediopassive at all, almost all

[846] See footnote 350 for alternative interpretations of this form as future form with split ergativity.
[847] See footnote 776 for an example following the Yukatekan paradigm, where no intermediate intransitivation is required.

these samples classify as a 1.a.ii scheme, as no root of a secure disharmonic spelling has been identified. The presence of a root harmonic vowel is supported by all CVC examples with a **CV$_1$-CV$_1$=yi** realisation for a *CV$_1$C-V$_1$y-i* form.

Two samples of a *CV'* root feature scheme 1.e.i and 1.e.ii spellings to ensure a full phonemic rendering (also a possible third example in Figure 131e): **CV$_1$'=V$_1$-yi** and **CV$_1$=V$_1$=yi**[848]. These case queue with the frequent practice with **CV'** morphographs among other showcases (Figures 84c, 90m, and 145m). Only one example is a non-CVC verb (Figure 127c), but also features a spelling where the suffix is harmonic to the second stem vowel: **V-CV$_1$-CV$_1$=yi**.

In comparison with root transitive equivalents, the harmony pattern is confirmed (compare Figure 127k with 100k), but also with other diatheses (compare Figure 127f with 51k and 127g with 51n). But the small number of integrative spellings together with a relatively small lexical diversity (Table 68) makes a more thorough comparison not overly productive.

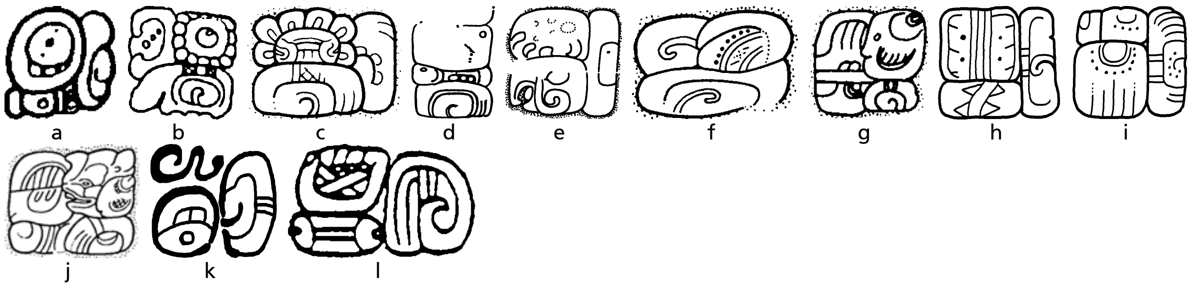


Figure 127: Examples of integrative mediopassive spellings following the standard pattern. **a) ja-tz'a=yi** (COL St. Nil Sajal, A16), **b) jo-mo=yi** (CPN St. 11, Bp1), **c) ju-bu=yi** (DPL HS. 4 V, E1), **d) i k'a=a-yi** (CPN HS. 1 XLI, D1a), **e) K'A'=a-yi** (TNA Mon. 77, pB1), **f) mu-ku=yi** (BLK St. 5, D5), **g) pu-lu=yi** (PAL TFC, L2), **h) sa-ta=yi** (PAL TI-E, O9), **i) t'a-ba=yi** (IKL Lnt. 1, B1)[849], **j) i u-xu-lu=yi** (COL P. Emiliano Zapata, D1), **k) wo-lo=yi** (MTL K793, F1), **l) yo-ko=yi** (CHN T4L-L3, D2)[850].

With most samples pertaining to scheme 2.e.ii, the gross is non-integrative along morphographic root spellings (Figure 128). Here, the lexical diversity even decreases (Table 74), most abundant is **T'AB** (Figure 128j-o) from the vast corpus of inscribed ceramic vessels. However, certain verbs that preferably appear in the mediopassive thus feature some intriguing graphematic variations in conjunction with the =**yi** suffixation. These are important for the understanding of representational rules and sign evolution.

[848] Although a separate scheme has been introduced with 2.e.ii for =**V-CV** suffixation of syllabically written roots, this, as well as the paradigmatic example in Figure 6j), is more towards a 1.a.ii scheme. As the 'vowel-only' syllabograms are indeed **ʔV**, the **a** sign actually provides the final glottal stop of the root *k'a'*, written by **k'a** only (also see footnote 317). But compare to footnote 766, that such spellings were emically rather considered as root underspellings.

[849] Refer to footnote 594 for the justification of this reading and the arguments for the additional decipherment proposal of **t'a**, as first speculated by David Stuart on the basis of this example.

[850] Proposed translation for *yok*: "to pierce". Compare to YUK *yok*, "horadar con punzón o lezna o punzar así" (Barrera Vásquez 1993: 978). No Ch'olan cognate can be found, so we apparently deal with a case of diglossia, where a Yukatekan lexeme is derived by ClM morphology. The semantic patient is *chan k'uh* (see footnote 759 for the attributive quality in this theonym).

Such **CVC=yi** spellings require reconstruction of the suffix vowel as *CV$_1$C-[V$_1$]y-i*. A few roots are hereby supported by full integrative spellings (compare Figures 128e with 127d-e, 128i with 127g and 128j-o with 127i and 130b).

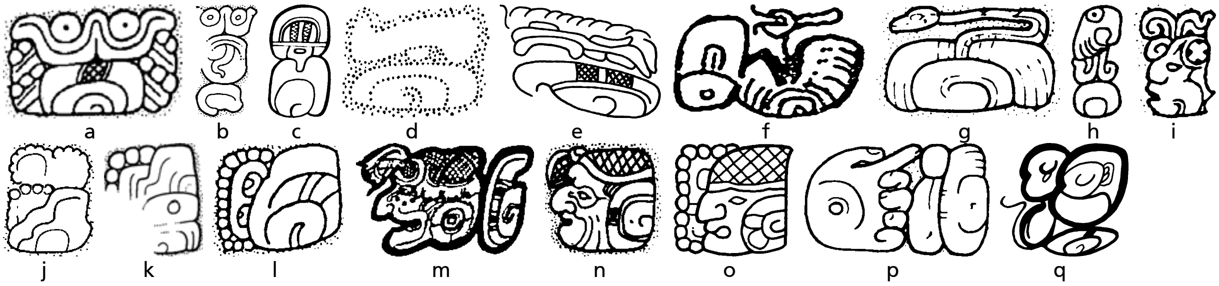


Figure 128: Examples of morphographic mediopassive spellings following the standard pattern. **a)** **STAR.WAR=yi** (YAX Lnt. 41, A2)[851], **b)** **STAR.WAR=yi** (CLK Frg. 27, 1), **c)** **TUN.SHELL=yi** (BPK ScS. 1, C2b)[852], **d) CH'AK=yi** (IXK St. 4, A2), **e) K'A'=yi** (ZPB K4692, C4)[853], **f)** [lo]**LOK'=yi** (C Dr. 73a, E3), **g) LOK'=yi** (DPL HS. 4 III, J1), **h) PUK=yi K'AK'** (NMP St. 15, D3a), **i) PUL=yi** (NAR St. 22, F18a), **j)** [t'a?]**T'AB=yi** (PNG Msc. Peabody, A5b), **k) T'AB=yi** (OXP St. 10, B2)[854], **l) T'AB=yi** (CPN Alt. Q, F1), **m) T'AB=yi** (ZBP K3636, B1), **n) T'AB=yi** (PAL TFC, M6), **o) T'AB=yi** (COL St. Randel, I3), **p) TZUTZ=yi** (DPL HS. 4 I, H2), **q) UH=yi** (RAZ K5022, A1)[855].

[851] The pre-analytical footnote 92 speculated about the graphematics and morphology of the 'Star War' expression. Compare this 'Shell Star' variant with the example in Figure 128b, a suffixed 'Earth Star' and also the one in Figure 131a. The results from showcase 2MED fully support the observations made in connection with nominalised transitives in footnote 812. The 'Shell Star' variant is always a mediopassive derivation with the =**yi** superimposed, the 'Earth Star' can occasionally be a mediopassive, depending on the suffixation with =**yi**, otherwise it is always a nominalised form. After a contextual analysis, I prefer this interpretation compared to those proposals that consider the **yi** sign as a phonemic complement, resulting in a variety of (mostly unpublished) **CVy** reading proposals (e.g. **CH'AY** [Marc Zender, written communication, April 1, 2004], **EK'MEY** [Aldana 2005: 313], **HAY** [Erik Boot, 1995], **NAY** [Christian Prager, written communication, November 5, 2009], **TZ'AY** ~ **TZ'OY** [Alfonso Lacadena]), among others. Such consideration would make all examples a nominalised form, either as a free-standing stative predicate with a prepositional phrase (Figure 107p), or a compound (Figure 108y). This would easier open up the possibility for ****u=STAR.WAR**, "it (was) the 'Star War' of NN", which is non-existent. Rhetorics rather preferred only two formulaic nominalisations, varying with a mediopassive diathesis that emphasises the subject of war.

[852] Together with the 'Star War' verb, another crucial phonemic reading is missing for the TUN.SHELL verb written by the grapheme XH2. Stuart (2012d) refers to it as a 'founding event', as it is followed by the *kan-[a]l* emblem on CRN HS. 2 1-V, B6b or the *lakam ha'* toponym on PAL T17P, B5-A6. Wagner (2004) correlates the expression with *lok'* events and reads it **LOK'** as well, as there are couplet-like patterns on BPK ScS. 4 and ScS. 5. On the other hand, Beliaev (2006) proposed the reading **SUT** based on the Ch'olan transitive verb *sut*, "turn around, return". Also compare to Hruby and Robertson (2001: 36-37), where the TUN.SHELL verb it is taken as a parallel example to *tzutz* to support the authors' line of argument for a passive shift *–V$_1$y* > *<h>…-aj* (see the discussion below).

[853] Context analyses of this death expression, semantically first identified by Proskouriakoff (1963: 163) and later deciphered by the example in Figure 127d (Schele and Looper 1996: 41), were recently conducted by Kettunen (2005, 2006: 284-97). The context of this example contains the infamous substitution with *u-sak-bak-ik'[-il] u-tis* (cf. Fitzsimmons 2012: 5), "his force and breath (and) his fart" (cf. Gronemeyer and MacLeod [2010: fn. 49] for the proposal to read sign AM1 morphographically as **BAK**). Interesting is the context on LMN St. 9 (Figure 130a) that misses the usual formulae, but has not been reassessed since the original discussion of the text (Closs 1988). The whole phrase (blocks A7-E2, reduced here by the king's titles) can be analysed as **K'A'=ya CHAN**[na] **WINIKHAB AJAW tzi-K'IN u=KAB=ji K'AK' yi=pi=ya CHAN**[na] **YOP=AT** … < *k'a'[-y]-Ø=iy chan winikhab ajaw tzik'in u-kab-[a]j-Ø k'a[h]k' y-ip-ya[j] chan yopat* …, "after he diminished, the 4-*K'atun*-Lord *Tzik'in*, he supervised it, *K'ahk' Yipyaj Chan Yopat*, etc." Hereby, the *u-kab-[a]j* expression refers back to contemporary stela erection (blocks A1-B4), while the death reference, introduced by a backward Distance Number, is a hypotaxis. The *k'a'* expression cannot be nominalised, as it otherwise would require an ergative inflection to bind a referential nominal phrase, hence an underspelled mediopassive is reconstructed.

[854] The equation of the FOOT.STEP sign ZY1 and the GOD.N sign PT4 as allographs for the verbal root **T'AB** has been challenged by several authors (e.g. Krempel and Matteo 2012: 145), together with the reading (e.g. Guenter 2003a: fn. 6). There are substitutions attested in functionally identical contexts, most notably the PSS dedication

The statistical analysis only yielded a number of 3.1% of samples that indicate the mediopassive suffix by =**ya** / __#, thus not spelling out the *–i* thematic (Figure 129). A possible phonetic explanation is presented further below, but also morphological considerations come into play. The examples appear both with integrative as well as morphographic root spellings.

But firstly, a careful distinction to other =**ya** / __# suffixations must be made, indicated by the context and the internal morphosyntax. Compare for example Figure 130a and Figure 107q, that lets both appear as a nominal form with the *=iy* enclitic when viewed isolated (see footnote 853 for the analysis). In case the narrative nexus does not indicate anteriority, =**ya** must be viewed as indicating the mediopassive (e.g. Figure 129e). The absence of an ergative pronoun likewise cannot claim an underspelled *–yaj* suffix (e.g. Figure 129f).

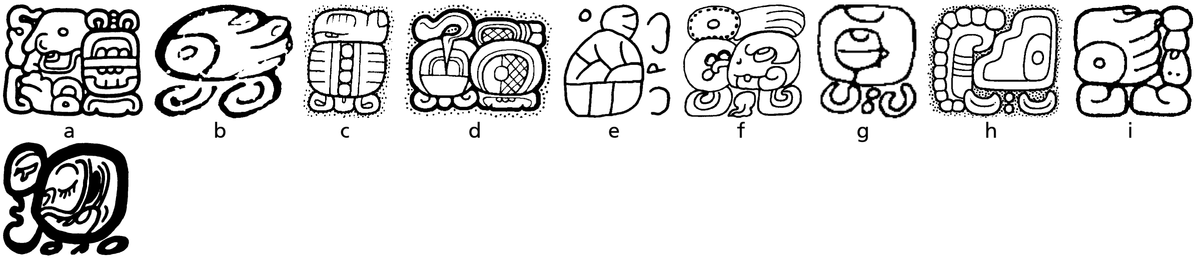
Secondly, it is to question whether in isolated cases, the genuine transitive root has been reinterpreted as an intransitive form with a 'change of state' semantics (cf. Wald [2007: 297-302] with case studies on lok' and t'ab), thus reflecting the further development of the suffix as the ECh intransitive

verb (MacLeod 1990: 128-129). Of course, both ZY1 and PT4 could simply appear as semantic substitutions, but there is some reason to consider them as allographs. MacLeod (1990: 140) noted that the footprint / dotted outline (= T45) sometimes appears with PT4 (Figure 128o, also K4689, B1, K1775, C1, CRC C17P-23-8, COL Trn. Amparo, D1, EKB M. R22, B1), but it is unlikely that we deal with a couplet in ligature. There is also one instance (K1921c, B1 and C1) where both graphemes (including suffixation) are paired. This is not necessarily an indication for two different readings and semantics, as expressions within a PSS can (rarely) be repetitive, compare *jich* and *y-ich* on K1348, D1-E1 and F1, but also the *te'-[e]l* on K1303, F1-G1. Nevertheless, Guenter (2003a: fn. 6) questions the reading for ZY1 to be **T'AB**, bringing forward the occurrence on DPL HS. 2 W IV, C2a, where the grapheme (with =**yi** suffixation) occurs with a toponym after a *lok'* event involving *Nun Ujol Chahk* of Tikal. On CNC P. 3, C2, the Machaquila toponym (Stuart and Houston 1994: 33, fig. 37). However, even in such historical contexts, ZY1 and PT4 seemingly substitute, compare to a similar phrase on BPK ScS. 4, D4-C5: **LOK'=yi tu=CH'EN^{na} T'AB PA'=CHAN^{na}** < *lok'-[o]y-i-Ø t-u-ch'en t'ab[-ay]-Ø[-i] pa' chan*, "he escaped from his place (and) ascends Yaxchilan." – Another note concerns the graphotactics of the prototypical sign shape (Macri and Looper 2003b), which in fact has wrongly been determined. The 'scroll' so frequently appearing within ZY1 is almost always absent with PT4. Only in a few cases, the 'scroll' as an abbreviated representation of ZUH **yi** is present by conflation or infixation (Figure 128n), even fewer cases exhibit duplication with a separate **yi** sign, e.g. on K1560, B1 that would classify as PT4'ZUH.ZUH. This is indication that the 'scroll' within ZY1 is a conventionalised conflation with **yi**, while the classification should ideally be ZY1'ZUH. This also explains, why with PT4, **yi** appears much more often as an externally attached grapheme than with ZY1 (Figure 128k), and why ZY1 sometimes also features an 'overspelling' with a redundant **yi** sign (also note the case of K1775, B1 with ZY1^PT4'ZUH.ZUH). Sometimes, the scroll of the conflated **yi** is absent with ZY1 (Figure 130c), thus classifying as a 2.g.ii scheme underspelling. Also, in those cases where **ya** is suffixed, the infixed or conflated **yi** is absent (Figure 129h). This is further proof that the 'scroll' is not just subgraphemic, but indeed has a phonemic value. The same conventionalisation is also true with the TUN.SHELL verb. Compare to a passive derivation (Figure 56j) where the 'scroll' is still present, but graphemically fossilised, as **ja** indicates the passive form (Hruby and Robertson 2001: 36-37); also with **i TUN.SHELL=yi** on TIK St. 5, A9, where both graphemes are not conflated. The same is true with the SNAKE.SHELL compound AC3 (again classified as one grapheme). In Classic inscriptions (and partly still in the codices, Figure 128f-g), it is rather AC3'ZUH and can be segmented as **LOK'=yi**. But the same grapheme string is apparently reinterpreted as **LOK'** in C Dr. 61, B11 and C Ma. 18a-20a within **u=LOK'** < *u-lok'-Ø-Ø*, "its emergence", a nominalised form. The 'scroll' of PT1 **PUL** is likewise no subgraphemic detail, but an infixed **yi**. Sign catalogues and sign classifications must therefore also include palaeographic considerations and how sign properties may change over time and get reinterpreted (cf. Spiegelberg [1908] for a case study of the sign N36 in Egyptian). The 'New Catalog' (Macri and Looper 2003b) is severely missing such aspects.

[855] Proposed reading for *uh*: "to sanctify, to make sacred". No syllabic substitution can confirm, but I follow the reading proposal made by Nikolai Grube (Grube and Gaida 2006: 66), agreeing that the sign is morphographic. Also refer to Krempel and Matteo (2012: 145, 161) that the use of this sign is a marker for Xultun school ceramics.

–V_1y [+COM] thematic (see Chapter 3.1.4.1)[856]. But in absolute figures (see Chapter 3.3.3.4.1), the samples almost exclusively occur with CaC roots, but again the amount is insignificant when e.g. compared to the abundant **T'AB=yi** cases. In conclusion it is still debatable, whether **CV$_1$-CV$_1$=ya** / **CVC=ya** spellings indicate *CV$_1$C-V$_1$y[-i]-Ø* / *CV$_1$C[-V$_1$y-i]-Ø* or *CV$_1$C-V$_1$y-Ø* / *CV$_1$C[-V$_1$y]-Ø* forms, but if the below phonetic considerations are correct, than the thematic should be reconstructed.

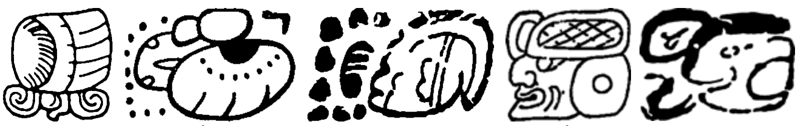
The case of a causative positional mediopassive (Figure 129g) with =**ya** (also see Figures 132c-d for another potential example with =**yi**) is classified as a 1.f.ii scheme. In comparison with antipassive (Figures 124e and 125f) and perfective (Figure 170b-g) examples, the spelling with the causative =**bu** suffix leaves little doubt of vowel assimilation with the *–V$_1$y* mediopassive suffix, hence we can reconstruct *pat-b-uy[-i]-Ø* of an underlying **pat-bu-V$_1$y-i-Ø* form.



a b c d e f g h i j

Figure 129: Examples of mediopassive spellings deviating from the standard pattern. **a) K'AK' 5-lo=ya CHAN** (QRG St. K, C7), **b) K'AL=ya** (COL K4960, pA1), **c) k'a-sa=ya** (PUS St. D, F12), **d)** ^{lo}**LOK=ya tu=CH'EN**^{na} (BPK ScS. 4, D4), **e) PAT=ya** (TRT Jd. 1, A6), **f) PAT=bu=ya** (PAL TISL, 13), **g)** ^{pu}**PUK=ya** (YAX St. 1, C8), **h) T'AB=ya** (XLM Col. 1, B5), **i) TZUTZ=ya** (QRG Alt. P', K2b), **j) UH=ya** (MTL K1728, D1).

Underspellings of the mediopassive suffix (Figure 130) are rather uniform. Only one potential 1.g.i case with a complemented morphographic spelling is attested (Figure 130b), resulting in a reconstruction *CV$_1$C-V$_1$[y-i]-Ø*. Another case (Figure 130a) underspells the mediopassive as a 2.f.ii scheme, but indicates suffixes to follow, so reconstruction results in a syncopated *CV$_1$C[-y]-Ø=[i]y* form. All reminders are plain 2.g.ii underspellings with a morphographic root, where **CVC** stands for a *CV$_1$C[-V$_1$y-i]-Ø* form. All of these exclusively appear with **T'AB** und **UH** from dedicatory texts (portable objects and monuments likewise).



a b c d e

Figure 130: Examples of mediopassive spellings with different underspellings. **a) K'A'=ya** (LMN St. 9, A7), **b)** $^{t'a?}$**T'AB-ba** (UXM Cst. 2, C1), **c) T'AB** (COL K4375, B1), **d) T'AB** (RAM Alt. 1, B2), **e) UH** (COL K6294, A2).

[856] Two examples appear isolated as early as *K'atun* 9.0 on ZAP St. 5; but here, =**ya** may indicate anteriority, as the partially eroded context reckons events following a backwards Distance Number (cf. Schele, Fahsen and Grube 1992: 4). From *K'atun* 9.9 on until the collapse, =**ya** suffixation appears with a very low frequency with one to three samples per interval. In connection with the geographic distribution, the pattern of these samples is very patchy and inconclusive.

Spellings with =**yV** / … indicate vowel syncopation of the mediopassive suffix to *–y* / … (Figure 131) and classify as scheme 2.f.ii. All instances sampled occur with a purely morphographic root, hence harmony patterns cannot be investigated. Except one possible abstraction (Figure 132), all other instances feature the temporal deictic enclitic *=iy* to follow, hence the syllabogram indicating the mediopassive remains =**yi** / … to provide the vowel of the suffix to follow: a **CVC=yi=ya** results in a *CVC-y-Ø=iy* form. The *–i* thematic suffix assimilates with the enclitic (see Chapter 4.1.13) into in a portmanteu suffix, but without any phonemic changes (as e.g. attested in CHR with the nominalisation *–a'r* < **–a-ar* of passives, footnote 447). The syncopation is not backed up by linguistic data, but is induced by the epigraphic evidence. Considering the same phonological reasons applied for the *–aj* suffixes (see Chapters 4.1.1, 4.1.2 and 4.1.3) and *–*V_1*w* antipassive (Chapter 4.1.10), the result would be the preferred bisyllabic form. Also, *=iy* is the only alternant of the enclitic that fosters a bisyllabic form[857]. In contrast, ~ *=ij=iy* necessarily requires a regular *–*V_1*y* suffix for a quadripartite syllabification (see Chapter 4.1.3), but is not attested.

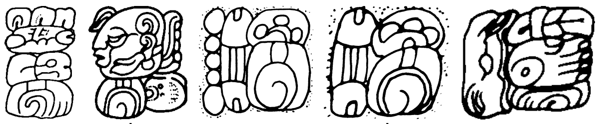
The case from Tonina (Figure 131e) is interesting in this connection, as the presence of the enclitic advocates syncopation, but a deliberate **a** sign does not. Instead of being an indicator for a **k'a'-ay-Ø=iy* pronunciation, I rather tend to consider it part of the syllabic root spelling, providing the root coda and with the vowel mute at a C.C boundary. It could also be viewed as ClM analytical overspelling to a certain degree, as the example appears in the context of spoken Tzeltalan, which has *<h>* as the mediopassive (Table 48).

a b c d e f

Figure 131: Examples of mediopassive spellings with a syncopated suffix in non-final position. **a)** **STAR.WAR=yi=ya** (TRT Mon. 6, G4), **b)** **TUN.SHELL=yi=ya** (PAL PT, C2), **c)** **LOK'=yi=ya** (BPK ScS. 5, E6b), **d)** **K'A'=yi=ya** (RAZ Jd. Mask, B5), **e)** **i k'a-a=yi=ya** (TNA Mon. 165, K1), **f)** **TZUTZ=yi=ya** (TIK St. 19, A12).

Only a few cases of debatable reading or segmentation are assigned to spelling group 4 for individual discussion (Figure 132). Their mediopassive nature is deduced from the suffixation with =**yi** and a predicative position.

[857] But in comparison with the inchoative, no syncopation with a trisyllabic form might still be possible. However, if the spellings in Figure 74 are compared, the root morphograph is always complemented with an additional **Ca** sign (at least with the Late Classic sound change). If it would not indicate a specific pronunciation, it would otherwise be unnecessary, compare to the examples in Figure 75g-i that do indicate syncopation by their pure morphographic root spelling, as it is the case with the mediopassive.



a b c d e

Figure 132: Examples of mediopassives with unclear reading or segmentation. **a) ?-mu=yi** (CRC Str. B16 Stucco, p18)[858], **b) ?-ni=yi=li** (CPN St. A, D6b)[859], **c) la-ko=bu=yi** (PAL TS, P16)[860], **d) ko=bu=yi** (PAL TS, I1), **e) u=K'AL=yi HUN** (PAL TC, O12)[861].

The summarising discussion of the mediopassive needs to tangle two major aspects: (1) the phonetics and syllabification; and (2) the diachronic development and distribution. With all different spelling patterns presented, the morphological analysis can now be reviewed under the actual pronunciation.

The regular $CV_1C\text{-}V_1y\text{-}i\text{-}Ø$ form of root transitives results in a trisyllabic form *[CV.CV.ji] of open light syllables, e.g. *jub-uy-i-Ø* as *[xu.b'u.ji]. Non-CVC stems result in four syllables: *uxul-uy-i-Ø* segments into *[ʔu.ʃu.lu.ji]. As such phonetics are still analytical and more towards a received pronunciation, some further thoughts for a 'spoken' ClM can be made on a comparative basis. When the final *–i* thematic is articulated, it might transform into a dissimilated [ɪ] in order to maintain a bisyllabic structure rather, e.g. *jub-uy-i-Ø* as *[xʊ.ˈb'ujᶦ]. This could explain the seldom use of =**ya** with CaC roots, where the suffix might have been reinterpreted as a weak schwa sound mirroring the suffix vowel, e.g. *[t'ʌ.ˈb'ʌjᵊ] (cf. Attinasi [1973: 48] for CHL evidence). This explanation for =**ya** would of course require a solid understanding of phonetics by the ancient scribes with a thoughtful transfer into a deep orthography – and therefore, it must remain highly speculative. Spellings with the temporal enclitic syllabify, as already indicated, also into a bipartite form with the mediopassive suffix syncopated, e.g. *tzutz-y-Ø=iy* as *[t͡su͡ts.jij].

[858] The graphemic segmentation is unclear. The first two appear to be **tzi** and **ta**, or together XH5(3) as the full form of **tzi**. It could also be an awkward plastering of **ju**, but it is questionable whether we deal with **bu** here (indicating a positional causative), as the leafy elements are absent (in comparison with blocks p3 and p12). But note that the same date of this text is associated with a *jub* event on CRC St. 3, C19-D19 against *Tzam*. But either **bu** or **ju**, the first sign must be a **Cu** syllable or a **CuC** morphograph. The preference for **mu** opts for a *Cum* root that is also possibly related to war. With the void syllabogram positions of ***ch'u** and ***wu**, no reasonable lexeme is found.

[859] An underlying transitive *Cin* root can be assumed by the presence of the **ni** syllabogram. Alternatively, the unclassified head sign may render the Maize God as PE8 **AJAN**, deciphered by Marc Zender because of the frequent complementation with **na** (cf. Martin 2007). As a versive (see Chapter 4.1.15), the *–iy* ~ *–ay* allomorphs might explain **ni** in that case. Apparently, the =**li** suffixation turns this intransitivation into an abstractive.

[860] Proposed translation for *lak*: "to bind, to grasp". Only two examples are attested from the inscriptions from Palenque, although it is not entirely sure whether the second case in Figure 132d is simply a truncated spelling. Also, the disharmonic spelling at a C.C morpheme boundary is somewhat unexpected. The =**bu** sign points to a positional root, and indeed we may tie these examples to a WCh vernacular, compare to the CHN transitive *läk*, "to tie, bind, hang, hook" (Knowles 1984-88) and adjective *läcä*, "colgado, tendido" (Keller and Luciano 1997: 148); as well as CHL *lac*, "garrado (objeto largo)" and *lacal*, "puesto (objeto largo)" (Aulie and de Aulie 1978: 48). The context of Figure 132c would support this reading with *ta ok-[e]l* (block P12), "by his feet", following. The context of Figure 132 is a bit more obscure, with *–tikil ch'ok-tak* (blocks J1-I2) following, however, the numeral classifier *–tikil* for counting people lacks a number.

[861] This sample can best be interpreted as a nominalised form *u-k'al-[a]y-Ø-Ø hun* ~ *u-k'al-[a]y-i-Ø hun*, where *–i* in the second alternative would be the putative nominaliser, while in the first case, the verbal *–i* is deleted upon nominalisation. See Chapter 4.1.14 for more thorough discussion of nominalised mediopassives.

In their historical reconstruction of 'Classic Ch'olti'an', Houston, Robertson and Stuart (2000: 332-333, fig. 4) assumed synchronous shifting patterns of passive > mediopassive for –V_1*y*, while mediopassive > passive for the original <*h*>*…-aj*. This model was questioned in the linguistic discussion (Chapter 3.1.4.1), assuming a shift from a pGT 'general versive' rather, as the semantics is also much closer.

In order to find epigraphic support for the 'Classic Ch'olti'an' model, Hruby and Robertson (2001: 26) claim for their case study of *tzutz* that "[a] well controlled, distributional analysis […] reveals an unusual, conservative pattern that is unlike almost all other transitive verbs […]." Such statement implies a certain conservatism in the morphology of this verb. In the following, I will bring evidence from my sampling, and although *tzutz* is a strong case with a large set, other selected transitive roots and their diatheses are diachronically viewed (Figure 133)[862], compared to the time spans of the original study. Also, the antipassive is added as another important detransitivation mechanism, thus covering all major processes for patient or object demotion.

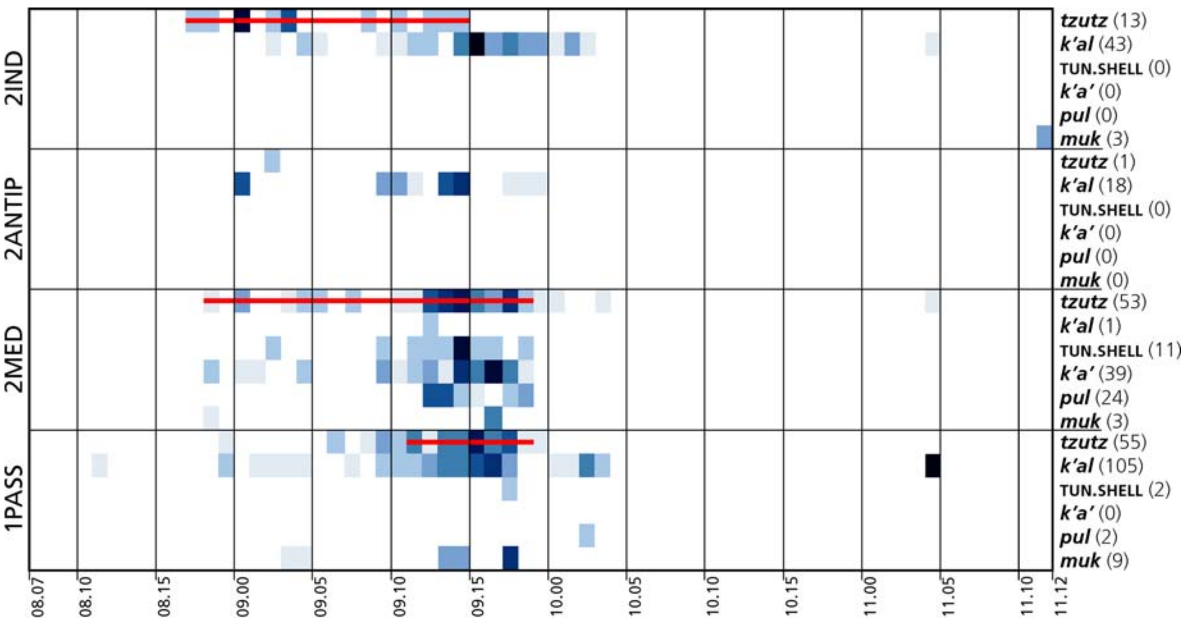


Figure 133: Heatmap of selected transitive verbs and their diatheses in diachronic development, in comparison to the data for *tzutz* (red line) after Hruby and Robertson (2001: tab. 1). Sven Gronemeyer.

Of course, the temporal serialisation just represents the source situation, while linguistic inferences can only be drawn as interpretative second stop. When indicative spellings with *tzutz* stop with 9.14, this is certainly not indication of language change. Compare to the shifted duration of indicative *k'al* samples. While the bulk of mediopassive *tzutz* spellings spans between 8.18. and 9.18., isolated

[862] The original study on *tzutz* serialises 41 monuments over time (Hruby and Robertson 2001: tab. 1), while the authors only count a singular appearance of *tzutz* on each monument. As multiple appearances may very well appear with different diatheses, this is methodological problematic. In contrast, Figure 133 considers all samples, resulting in 121 for *tzutz* alone (while $N_S := |382|$ with all six lexemes). Compare for example to the three different *tzak* inflections (1 transitive, 2 different nominalisations) on YAX Lnts. 38-40 that are all part of Structure 16 and deal with different conjurings during the reign of Yaxun Bahlam IV. Of course, these are three different 'monuments', but one coherent narrative.

cases still appear in the Dresden Codex as late as 11.4. Other lexemes have different runtimes, and always feature certain gaps in the source record.

But most intriguing are the passive attestations. Here, the record for *tzutz* starts much earlier than claimed by Hruby and Robertson, dating back to 8.19 (PRU St. 15, E8). Hereby, *k'al* provides an even earlier *terminus post quem* for the <*h*>…*-aj* passive with an isolated record likely dating to 8.11 (COL JM Plaque 4442, A11) than any mediopassive[863]. As the source situation for the Late Pre-Classic and Early Classic is very scarce (see Chapter 2.5.4 for methodological constraints), these inscriptions are a dangerous ground to anchor an absolute chronology of language change (also the showcase of the putative pCh <*h*>…*-aj* intransitive positional marker in Chapter 4.1.2).

In any case, the data retrieved for this study draw quite a different picture than the model superimposed by Hruby and Robertson on the data. Even by considering the distribution of only five additional transitive roots, it becomes evident that the <*h*>…*-aj* passive and –V_1y mediopassive are simultaneously appearing at least since the Early Classic as two distinct and established intransitivations. Although the authors (Hruby and Robertson 2001: 34) interpret the data with their temporal gaps in a way "that the spread of the new Classic Ch'olti'an passive, *-h-…-aj* was somewhat uneven, however, with *tzutz* maintaining the –V_1y passive in the Early Classic", this is a biased conclusion[864]. If one compares the distribution of verb forms for one lexeme and all six exemplary lexemes together, there are two far more comprehensible explanation than changes in the morphology: (1) changes in rhetorics that may even become clearer if these data were examined by individual sites; (2) semantic restrictions regarding the degree of affectedness of the patient, where some verbs or the context may not allow a mediopassive at all (cf. Haspelmath 1987: 15), hence there are no parallels in the distribution between *tzutz*, *k'al* or *k'a'*. Hruby and Robertson (2001: 37) at least suggest rhetorics for the discontinuation of the indicative among *tzutz*, but tie it to the introduction of the <*h*>…*-aj* passive.

The epigraphic evidence does not readily suggest how these forms developed, but prove that no such language change took place during the time ClM was applied in writing, as several authors (Houston, Robertson and Stuart 2000: 332-333, Hruby and Robertson 2001) assume in the studies for their 'Classic Ch'olti'an' equivalent. Even more, the –V_1y mediopassive of ClM apparently did not cease to exist with the extermination of a hieroglyphic writing tradition and its transition into the ECh intransitive thematic. In contrast to the language descriptions (Chapter 3.1.4.1), reflexes are seemingly still found in CHR, compare the causative *pukres*, "stir up, mix, cause to dissolve" with *pukruih*, "stir of itself, become mixed up" (Wisdom 1950: 576), morphologically dissimilar to CHR –V_1y ~ –*Vy* intransitive markers (but also without the –*i* thematic). As this was the only case discovered (see footnote 891 for the –*Vih* orthography applied), it is to question if this is still a productive process.

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[863] Apart from any lexeme, the earliest dateable epigraphic attestations for a showcase are: 1PASS – 8.11 (**K'AL=ja TUN**$^{\mathrm{ni}}$, COL JM Plaque 4442, A11), 2IND – 8.11 (**u=JOY=wa**, COL JM Plaque 4442, A5), 2ANTIP – 9.0 (**K'AL=wi TUN**, TIK St. 31, D9), 2MED – 8.17 (**T'AB=yi**, TIK St. 39, Bp4a).

[864] My reading of this quote is a reference to the absence of *tzu<h>tz-aj* examples until 9.12 in their data. As the study has no earlier *terminus ante quem*, then *all* cases of *tzutz-uy-i* spellings simply must be considered as passive forms. I also find it problematic to attempt the reconstruction of (morphological) language change by the data from one case study.

Based on the attested spellings, the following canonical spellings of mediopassives (Table 83) can be determined. Note that these are morphological and not necessarily phonetic. All cases that are securely identified as a mediopassive follow the ClM pattern, vernacular forms (such as the CHL <*h*>…*-i* or pTz <*h*>) have not been found or securely isolated by an inscription's provenance, except the pYu <*V*>…*(-k)-i* (Figure 203l). Those Ch'olan 'celeritive' mediopassives following a *–C-aj* pattern are discussed in Chapter 4.1.1 (Figure 64), as they follow a different derivation process.

Type	Transcribed Paradigm	Canonical Spelling
-MED CVC VER.TR.R	*CV$_1$C-V$_1$y-i-Ø*	**CV$_1$-CV$_1$=yi / CV$_1$=V$_1$-yi**
	CV$_1$C-V$_1$y[-i]-Ø	**CV$_1$-CV$_1$=ya**
	CV$_1$C-V$_1$[y-i]-Ø	**CV$_1$-CV$_1$**
	CV$_1$C-[V$_1$]y-i-Ø	**CV$_1$C=yi**
	CV$_1$C-[V$_1$]y[-i]-Ø	**CV$_1$C=ya**
	CV$_1$C-[V$_1$y-i]-Ø	**CV$_1$C**
	CV$_1$C-y-Ø=iy	**CV$_1$-CV$_1$=yi=ya / CV$_1$=V$_1$-yi=ya / CV$_1$C=yi=ya**
	CV$_1$C[-y]-Ø=iy	**CV$_1$C=ya**
-MED CVC VER.TR.D	*CVC-C-Vy-i-Ø*	**CV-CV=CV=yi**
	CVC-C-Vy[-i]-Ø	**CVC=CV=ya**

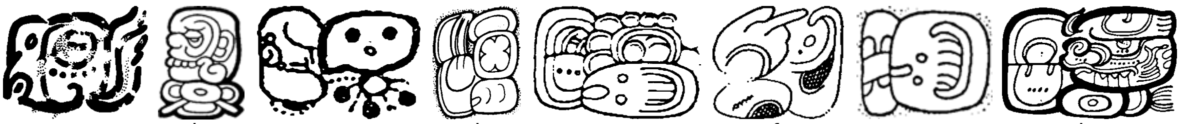
Table 83: Morphological paradigms and canonical spellings of mediopassives.

4.1.13 – Intransitive Marker *–V$_1$y ~ –Vy*

Root intransitives with a final **Ci** / __# spelling were first discussed by several authors (Houston 1997: 293-294, figs. 2-3, Stuart, Houston and Robertson 1999, II: 29) and interpreted to represent *–Ø* [+INC]. Therefore, spellings with **Ci=ya** / __# should indicate *–iy* [+COM] (see footnote 439 and section 2c of Chapter 3.2.1 for a broader discussion). Only later, *–i* was acknowledged as a single argument predicate marker (Houston, Robertson and Stuart 2000: 329), but without necessarily tying it to a specific aspect.

By following the model of temporal deixis marking by enclitics (Wald 2000, 2004b, 2007: 522-801, Wald and MacLeod 1999), this study (as outlined in Chapter 3.1.4.1) takes *–i* [+COM] as the primary ClM root intransitive marker (Figure 134) on the basis of Ch'olan linguistic evidence (Table 46). Although it is not part of the showcases, a short excursus is valuable for contrasting the orthography of these markers against the *–V$_1$y* intransitive marker and the *=iy* enclitic. As ECh evidence demonstrates, alternative *–V* aspect markers may be suffixed, depending on the root vowel (see footnote 865).

The sample screening is of course not systematic, but mirrors the above assumptions. Interestingly, no example to spell *och-i ~ och[-i]* outside an 'intransitive compound' example (see Chapter 4.1.14) was readily found, although these are true root intransitive verbs.



a b c d e f g h

Figure 134: Examples of root intransitives with an *–i ~ –V* root intransitive marker. **a) a-ni** (YLS Dwg. 1, E1), **b) CHAM-mi** (COL P. DOAKS 1, J1b), **c) ^{e}EM-mi** (C Dr. 20b), **d) i EL-le** (TRT Mon. 6, I6)[865], **e) i hu-li** (NAR St. 29, G17), **f) HUL-li** (TRT Mon. 8, B20), **g) ta-li** (CPN Alt. Q, B4), **h) i u-ti** (PAL 96G, G1)[866].

Intransitive roots with only a morphographic roots spelling (Figure 135) appear to be relatively rare. In these cases, the final *–i ~ –V* aspect marker requires reconstruction. Such analysis requires great care, as it cannot be excluded that also a *–V_1y ~ –Vy* suffix is underspelled (compare Figures 134c, 135b, and 137b-d). Such decision has ideally to take place on a contextual, temporal and geographic patterning.

a b c

Figure 135: Examples of root intransitives with an underspelled *–i ~ –V* root intransitive marker. **a) CHAM** (TIK MT. 28, A16), **b) EM** (PAL TC, D7a), **c) HUL TAL** (TRT Mon. 8, B11)[867].

Based on the model of temporal deixis, **Ci=ya** / __# spellings (and rarely ~ **Ci=ji=ya** / __#) apply the *=iy ~ =ij=iy* enclitic (Figure 135). Again, such spellings bear the danger of interpreting them as *–V_1y ~ –Vy* aspect markers, as several authors have done based on linguistic evidence[868]. Such assumption is only viable if (1) the narrative structure and calendrical nexus does not indicate anteriority[869], and (2) an ECh vernacular context may be given. Wald (2007: 241-267) has given the implications of glyphic spellings of intransitive affixation an in-depth comparative discussion.

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[865] Such spellings also occur on PAL SLAV, G5b and CPN St. 15. The analysis as *el-e-Ø* (Gronemeyer and MacLeod 2010: fn. 45) is based on CHR *–e* / CeC__, otherwise *–i* / CVC__ (Table 46). Considering the prevalence of forms in ClM that are reflected in ECh, it is a viable assumption even for the examples from the western sites of Palenque and Tortuguero. That *e[h]m* occasionally takes *–i* as the aspect marker (Figure 134c) instead of *–e* may be explained with the aspirated nucleus, as it is not a pure CeC root. But this codical example may also reflect the Yukatekan *–i* aspect marker, as Classic period examples frequently exhibit *–ey* (Figures 137b-c), although this seems unlikely. The suffixation of the ClM *=iy* enclitic in the Paris Codex (Figure 137d) supports a genuine Ch'olan pattern.

[866] See Stuart (1990a) for a case study of the morphology of *u[h]t* and footnote 369 for the etymology and possible morphology of this verb. Also note the spellings with the CHUWEN.SKULL sign SCH (Figure 136k, see footnote 110) to provide the root internal /h/.

[867] This block combines the intransitive verbs *hul* and *tal* in a couplet to express different aspects of 'arrival' (Gronemeyer 2004: 176).

[868] Compare to CHT *chamai*, "die" (Fought 1984: 53) and CHR *chamay*, "die, pass away" (Hull 2005: 16), whereas the pattern is with *–i* in WCh, see *chamel*, "morir" (Aulie and de Aulie 1978: 26). Spellings of **CHAM=yV** have also been analysed as a mediopassive (Mathews and Bíró 2005-08), which is doubtful because of the intransitive nature of the root.

[869] This for example concerns the **AN=ya** spelling on TIK Alt. 5 (Figure 136a) that follows the opening Calendar Round of the inscription. It could thus be interpreted as ***a[h]n-[V]y-Ø*, also if one compares to the example in Figure 137a. The later death reference in block 12 is connected by a Distance Number to count from the initial 9.12.19.12.9 to 9.13.11.6.7, the verb is recorded as **CHAM=ya**. Hence, little doubt is left that both events are anterior to the *k'u<h>b-aj* event in block 15 (Figure 51h), dating to 9.13.11.6.7 and detailing the tomb re-entry and the associated rituals (Eberl 1999: 46-47). Thus, **=ya** marks the *=iy* enclitic in these cases.

Intransitive verbs marked for temporal deixis have an underlying **VER.INTR-*Ø-i=iy* form. No secure answer can be given regarding the morphophonemic process of the *–i* marker. If one follows the line of argumentation by Wald (2007: 616-620, 623-624), the aspect suffix assimilates with the following enclitic, so the morphological analysis can be given as VER.INTR-*Ø=iy*.

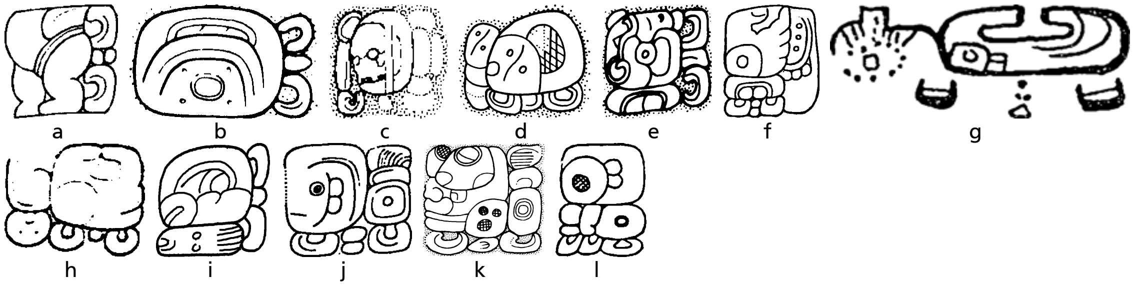


Figure 136: Examples of root intransitives with a non-final *–i* ~ *–V* root intransitive marker. **a) AN=ya** (TIK Alt. 5, 3), **b) BIX=ya** (DPL HS. 4 III, K2), **c) CHAM-mi=ya** (ALS P. 2, B2), **d) CHAM=ya** (OAG Alt. 1, M1), **e) hu-li=ya** (PAL TC, A11), **f) HUL-li=ya** (YAX Lnt. 29, D1), **g) o-chi=ya** (C Ma. 102d), **h) OCH-chi=ya** (NAR St. 30, F4), **i) ta-li=ya** (CRN P. 1, D5), **j) u-ti=ya** (LAC P. 1, E2), **k) UH-ti=ya** (TRT Mon. 6, M1), **l) u-ti=ji=ya** (CPN Alt. F' C1).

Intransitive marking with a *–*V_1*y* ~ *–Vy* suffix (Figure 137) was first exemplified among **HUL**=**ye** spellings (Figure 137e) by Stuart, Houston and Robertson (1999, II: 37); interpreted as an Early Classic completive aspect marking[870]. But the assumed underlying *–*ey* suffix has to be different to the regular *–i* completive aspect marker. While Chapter 3.1.4.1 identified *–*V_1*y* as the ECh intransitive completive aspect marker, most cases exclude such vernacular interpretation by (1) their early dating, (2) their provenance, and (3) indications of a *–Vy* vocalisation (Figures 137a, g) if an integrative syllabic spelling is assumed. However, Zender (2005b: 12-13) interprets such forms as intermediate in the development towards ECh and takes them as evidence for the primary ECh nature of ClM[871].

The sample set is not overly significant and not necessarily decisive to reconstruct the vocalisation and the exact function of the *–*V_1*y* ~ *–Vy* marker. Most samples adhere to spelling group 2 and the spelling patterns are too diverse to identify a specific suffixation pattern. Furthermore, not all spellings are beyond doubt: **e-mi**=**ya** (Figure 137d) could be indicating the enclitic (compare to the codical spelling in 134c), and **ko-jo**=**yi** (Figure 137g) could be interpreted as a mediopassive (Wald 2007: 295-

[870] All attested cases with *hul* originate from early monuments, namely TIK Marcador and ZAP St. 5, A7, where **3**=**HUL**=**ye** denotes Glyph D of the Supplementary Series. While the consideration as a completive marker is correct (as *–el* [+INC], see Table 46), the line of evidence can only be inferred. Glyph D can be realised by **HUL-li** ~ **hu-li** < *hul-i-Ø* (e.g. YAX HS. 3 III, C1) or **HUL(-li)(=ji)=ya** ~ **hu-li=ya** < *hul-Ø=iy* (e.g. TIK St. 6, A8b) spellings (cf. Schele, Grube and Fahsen [1992] for a systematic overview in a tabulation of 192 Lunar Series). Those with an enclitic are far more common and which is interpreted as the *–*iy* [+COM] marker by the authors. Because of the =**ye** sign, the assume a harmonic *–ey* suffix, thus implying a Late Classic sound change [e] > [i]. However, both patterns with *hul* are contemporary, and even later do =**ye** spellings appear with other lexemes.

[871] This is however a biased perception: ECh is only daughter to pCh and is thus also later than the emergence of ClM. If ECh and ClM show a close correlation, then only because ECh reflects traits of an ancestral stage more than the WCh languages (but see the discussion of the diffusion of positional marking in footnote 498). On the other hand, we also find forms in ClM (e.g. the *–Vy* versive, see Chapter 4.1.14) that are only reflected today in WCh. Zender also bases his assessment solely on *e[h]m*, see Chapter 4.1.12 and the discussion of *tzutz* regarding the danger of such restricted case studies.

297)[872]. The only true support for an ~ *–ey* alloform comes from the **a-ne=ya** spelling (Figure 137a, compare to Figure 134a), while the =**ye** suffixation with *hul* and *e[h]m* is inferred support with a suffix vowel harmonic spelling.

The analysis of the data allows to hypothesise the following: (1) the vocalisation of the suffix is likely / predominantly *–ey*, (2) it is a rare alloform to *–i* with intransitive verbs of motion, and (3) it is a genuine ClM suffix and not an indicator of vernacular forms, although *–Vy* markers persist in CHR (see below) and CHL (but where /y/ is epenthetic / …, see footnote 374). Two sample agglomerations are visible: with *hul* in the central lowlands centred around the entrada events, and with *e[h]m* in the western regions. But the use of *–ey* cannot be determined by the lexeme or language geography, possibly some special semantics or spatial deixis is involved. In the end, the case of intransitive marking by *–V₁y* ~ *–Vy* must remain inconclusive by the small amount of data, both morphologically and phonemically.

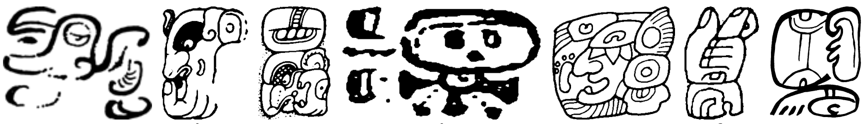


Figure 137: Examples of root intransitives with a *–V₁y* ~ *–Vy* root intransitive marker. **a) a-ne=ya** (JOL Dwg. B, A3), **b) EM=ye** (TIK T. 4 Lnt. 2, B4a), **c) i EM=ye** (TRT Mon. 6, E10a)[873], **d) e-mi=ya** (C Pa. 17b), **e) HUL=ye** (TIK Marcador, D1), **f) HUL=yi** (TIK St. 31, C20a)[874], **g) ko-jo=yi** (NTN Dwg. 49, A2).

If the case of the intransitive marking were not already indecisive enough, there is one example of group 4 (Figure 138). The =**li** suffixation as well as the context indicates a possible nominalised abstraction (cf. Houston, Robertson and Stuart 2001b: 7-8) of *cham*. But why =**ya** is written, remains unclear. The provenance would make an ECh vernacular *–V₁y* completive marking plausible, but not within a nominalisation. Also, an underspelling for *–yaj* is unlikely, as this is only a nominaliser of transitive verbs (see Figure 82).

[872] Although the **CV₁-CV₁=yi** spelling is paradigmatic for a mediopassive, I follow the TZE and TOJ evidence cited by Wald to assume an intransitive root, but cannot exclude the possibility that in ClM, it was a transitive verb.

[873] Sanz González (2006: 465-468) analyses the verbal form as **ch'o-ye=la**, but a comparison with the original monument proves that the holes within the circle of the **ye** hand are not AMB, but rather traces of erosion, hence no **la** sign is present. See Gronemeyer and MacLeod (2010: fn. 45) for further discussion.

[874] This example is related to the *entrada* event by *Sihaj K'ahk'* on 8.17.1.4.12 in a retrospective passage. The =**yi** suffix is not indication of the *=iy* enclitic to indicate anteriority, as other verbs in this phrase do not exhibit spelling patterns for the enclitic (**HUL=OK=ja** [Figure 78d] and **OCH=HA=ja**, D23). Other examples do apply the enclitic in **HUL=ya** spellings, e.g. UAX St. 5, B8, UAX St. 22, B9, or SUF M. 9, D6. These are thus also implying an analysis as *hul-Ø=iy*, thus marking the completive aspect with *–i* instead, while being contemporaneous (except UAX St. 22) with **HUL=ye** spellings.

a

Figure 138: Examples of root intransitives with a *–V_1y ~ –Vy* root intransitive marker of unclear morphology. **a)** **^{cha}CHAM=ya=li** (CPN St. A, C7b)[875].

As the discussion shows, it is difficult to develop a solid case study, even more to define canonical spellings (Table 84). Instead of summarising paradigmatic spellings, the table rather lists the evidence.

Type	Transcribed Paradigm	Canonical Spelling
-COM	*CV_1C-V_1y-Ø*	**CV_1-CV_1=yV**
CVC	*CVC-ey-Ø*	**CV-Ce=ya**
VER.INTR	*CVC-[e]y-Ø*	**CVC=ye**

Table 84: Morphological paradigms and canonical spellings of intransitive completive marking.

4.1.14 – Intransitive Nominaliser –Ø and *–i*

Before further discussing *–V_1y ~ –Vy* suffixes, a short excursus will tie the nominalisation of intransitive verbs up to root intransitive spellings (Figures 134 and 135). Three environments can be determined: (1) prepositional phrases, (2) possessive phrases, and (3) intransitive compounds. The first two are important, as they also appear with derivation processes discussed along the showcases. Nominalisations that take place with the *–Vl* suffix are excluded for further discussion in Chapter 4.1.18. The evidence provides strong support to a *–Ø* nominaliser, and weaker support to *–i*, as attested with transitive roots (Chapter 4.1.9).

Cases of nominalised intransitives in prepositional phrases (Figure 139) are more frequent than those of transitive verbs (Figure 107o), and most occur after *u-bah* statements. The spelling schemes suggest that derived intransitive verbs bind the *–Ø* nominaliser after the derivational suffix or thematic suffix, and root transitives directly to the root[876]. The variations between Figures 139c-d are inconclusive, but may indicate an *–i* suffix (see Figure 107h). The question is whether the **hi** sign in Figure 139c is to reinforce *–i*, or to indicate *–ih ~ –ij* or even *=ij=i[y]* (in case of ignoring the orthographic distinction not untypical for Late Classic Yaxchilan).

However, it is not beyond all doubt that all the cases illustrated (except 139e and 139h, see below) must necessarily be nominalised like their transitive counterparts (Chapter 4.1.9), depending whether *ti ~ ta* only functions as a preposition in ClM, or also as a conjunction. Take Figure 139i and

[875] This spelling appears in subject position of the passive *su<h>s-aj* (Figure 51q), following **ba-ki**. Eberl (99: 75) translates as "es wird knochen-geschlitzt der Tote" ('the dead is being bone-slitted'), but I would miss an ergative inflection with *bak*. In any case, as Eberl points out, this phrase details is a post-mortuary treatment, which is indicated by the following *och-Ø+bih-Ø=iy* statement, "after he road-entered."

[876] Although it is the only example found with a phonemic coda complement, Figure 139i is good support, for a **CV_1** syllabogram as no **Ci** / __# is required to indicate the completive aspect in a nominal form. The case of Figure 139h is purely morphographic and has to be a nominalised compound.

compare between *u-bah-Ø ti way-Ø*, "it (was) his image in sleep" or *u-bah-Ø ti way[-i]-Ø*, "it (was) his image as he slept." Again, the investigation of complex clauses is not the scope of this study[877], although it might elucidate some morphological aspects from a different perspective than an orthographic analysis. From a paradigmatic point of view, it seems more likely to find a nominalised form following a stative predicate. Still, it is hard to define a translation of such construction to capture all the semantic nuances of intransitivised forms applied, such as *u-bah-Ø ti a[h]k't-aj-Ø*, "it (was) his image in becoming dancing."

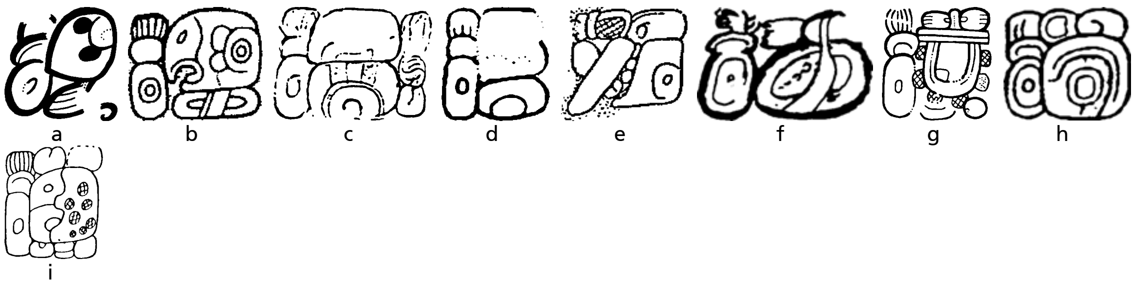


Figure 139: Examples of nominalised intransitive verbs in prepositional phrases. **a) ti AK'=TAJ** (BPK R. 1-42, A2), **b) ti aAK'-ta** (YAX Lnt. 2, F1), **c) ti CH'AB=yi=hi** (YAX St. 35, B1)[878], **d) ti CH'AB=yi** (YAX Lnt. 17, B1), **e) tu=JEL-le=ye** (CPN Alt. U, I3)[879], **f) ti JOY=ja** (COL K3026, E1), **g) ti TAN LAM=wa** (CRC BcM. 4, E3), **h) ti OCH=CH'EN** (NAR St. 21, A4), **i) ti waWAYya** (YAX St. 12, F1).

Those cases of a nominalised intransitive in a possessive phrase (Figure 140) always appear in predicative function. Their intransitivising suffix or thematic marker is retained, to which the –Ø suffix is added. The inflection with 3SG.ERG ensures to bind the subject. The underlying intransitivation process is either overt by the spelling or by the context, e.g. **u=K'AL=TUN=ja TIWOL** < *u-k'al-Ø+tun=[a]j-Ø-Ø tiwol [chan mat]*, "it (was) the stone-binding-becoming of *Tiwol Chan Mat*" (Figure 140e) must be a nominalised inchoative compound (but compare to Figure 140f).

877 But as the discussion of relative clauses in Chapter 4.1.10 demonstrated, a dependent clause is gapped, so it would seem unlikely that *ti* ~ *ta* can be used as a conjunction for a temporal clause. This also seems unlikely in comparison with Ch'olan grammars that do not indicate such constructions or finite verb forms in a prepositional phrase. Thus, not only graphematic and morphological considerations argue for nominalised forms, but also the syntax.

878 This example and the one in Figure 139d are accompanying scenes of tongue bloodletting (cf. Gronemeyer 2003: 7-9), following an *u-bah* statement. Other texts apply an abstractive nominalisation, e.g. **u=BAHhi ti CH'AB=li** < *u-bah-Ø ti ch'ab-[i]l*, "it (is) her image with the creation" (YAX Lnt. 24, B1b-C1, G1). From other contexts of conjuration, we also have –Ø nominalisations of the transitive root *ch'ab* attested, e.g. **u=TZAK=K'UH tu=CH'AB ti ya=AK'AB=li ja-sa=wa CHANna K'AWIL** < *u-tzak-Ø+k'uh-Ø ti ch'ab-Ø ti y-ak'ab-[i]l jas-aw chan k'awil*, "it (is) the god-conjuring of *Jasaw Chan K'awil* with his creating in his darkness" (TIK T. 1 Lnt. 3, C3-C5); likewise in the parentage statement identified by Christopher Jones (1977: 41-42) as well as Linda Schele and Peter Mathews (cf. Schele and Miller 1983: 34-35), e.g. **u=BAHhi u=CHIT=CH'AB** < *u-bah-Ø u-chit-ch'ab-Ø*, "it (is) the image of his co-creating" (TRT Mon. 6, J16-I17). See footnote 945 for an alternative interpretation based on *may-i*. While the **hi** is interpreted to provide *–i* here, it may likewise be independent and spell the demonstrative pronoun *hi-Ø*, "it" (cf. Bíró 2011c: 302).

879 This transliteration imposes an analysis of an underlying *t-u-jel-ey-Ø* nominalisation of a mediopassive. But likewise, an interpretation as **tu=JELle=ye** < *t-u-jel-y-e[l]* (Figure 161b) is likewise possible or even more plausible, with a scheme 1.f.i underspelling for the *–el* nominaliser (compare to Figure 160).

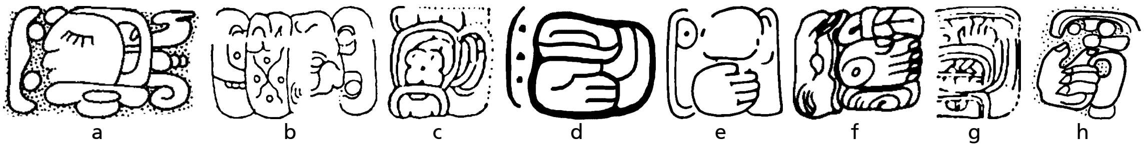


Figure 140: Examples of nominalised intransitive verbs in possessive phrases. **a) u=CHAM-mi=ya** (KAB Str. 2C6 NJ, E1), **b) u=CHIT=ja** (CPN T. 11 WDSP, B5)[880], **c) u=CH'EN=na=ja** (CPN St. P, D4)[881], **d) u=K'AL=ja** (ALH Jd. 1, A6), **e) u=K'AL=TUN=ja** (PAL TCI1, E2), **f) u=K'AL=yi HUN** (PAL TC, O12)[882], **g) u=PAT=na=ja** (CPN St. P, C3), **h) u=TZUTZ=ja** (TZB T. 4 Lnt. 3, D2a).

When considering the inchoative of nominal compounds, there can be little doubt that any verb therein must be nominalised. Especially the intransitive verb *och* often appears with a variety of nouns (Figure 78j-n), also outside an inchoative derivation (Figure 141). It is to question whether these cases, often (if not exclusively) graphotactically aligned in one single glyph block are compounds of a nominalised intransitive root as well, as Grube (2004d: 74-75) assumed by syntactic considerations of the paradigmatic *och-bih* and coining the term 'intransitive compound' (see footnotes 96 and 333 for preliminary considerations). They usually bind a referential agent, and Grube correctly points out that *bih* thus cannot be the subject, nor the object being entered (as with an intransitive verb), but his further explications must be thoroughly questioned.

Firstly, not every noun is required to join a verb in whatever kind of morphological unit under certain conditions: (1) no referential agent must be present, and (2) the noun may allow the action expressed by the verb[883]. Grube assumes a process of object incorporation for his 'intransitive compounds', but these processes must be viewed separately. Object incorporation in the narrow sense is only possible with the patient, thus typologically only possible with transitive verbs (Comrie 1978: 388-389) and certain derivations, such as the antipassive (Chapter 4.1.10). Compounding is possible with a noun, and examples without a referential agent can indeed be compounds acting as a stative predicative, e.g. **OCH=WITZ** < *och-Ø+witz-Ø* (Figure 141g) as it follows a transitive nominal compound *k'al-Ø+tun-Ø* in block E3: "it (was) a stone-binding, it (was) a mountain-entering." Similar is the compound in the prepositional phrase in Figure 139h: **u=BAH**[ji] **ti OCH=CH'EN** < *u-bah-Ø ti och-Ø+ch'en*, "it (was) his image of cave-entering." But with a referential agent present and if not further intransitivised (such as by the inchoative, Chapter 4.1.3), these intransitive compounds would require 3SG.ERG to bind the agent (see the paradigm for transitive compounds in Chapter 4.1.9).

Many of these 'intransitive compounds' therefore do not fulfil the requirements for a compound and have to be intransitive. Also, some cases have a possessed noun untypical for compounding (Fig-

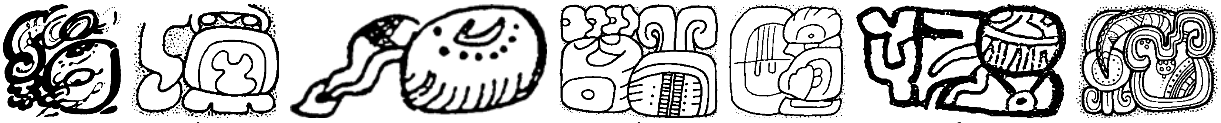
[880] See footnote 682 for a discussion of the syntactic embedding of this form in the clause and its semantic interpretation.

[881] For a discussion of the underlying morphology as an apparent derived transitive passive of this example and the one in Figure 140g, see footnote 652.

[882] See footnote 861 for a morphological analysis. The clause continues to name *K'inich Kan Bahlam* with his titles in blocks O13-O15. Thus, *hun* as the subject position of this possessive phrase must be inflected with 3SG.ERG to syntactically bind the Palenque ruler to the action. The **u**= sign in front of the block could fulfil this double role, see Zender (1999: 125, fig. 46) for other such abbreviatory spellings.

[883] For example, *k'a[h]k'* may be the agent to *och*, as the fire may actively enter (fill) a structure in a dedication ceremony as can *nah* be the agent to *el*, as the structure can (figuratively) burn (Stuart 1998). In a death statement, *bih* cannot be the agent of *och*, as the road does not enter, but the deceased does.

ures 141b, f), and some feature a **Ci / __#** grapheme usually indicative of the *–i* aspect marker (Figure 141d).



a b c d e f g

Figure 141: Examples of 'compounded' nominalised intransitive verbs. **a) OCH bi-hi** (COL K6751, N4), **b) OCH u=CH'EN^{na}** (TZB Mon. 5, B1), **c) OCH HA'** (RAZ Mask, A2), **d) OCH-chi K'AK'** (YAX Lnt. 31, J4), **e) i OCH OTOT** (PAL TCJ, Ap4), **f) OCH yo=OTOT** (C Ma. 103c1) **g) OCH WITZ** (COL P. Houston, F3).

A solution for these 'intransitive pseudo-compounds' are prepositional constructions, where the preposition is regularly underspelled. Verbs of motion and certain other intransitives furthermore can indicate spatial deixis with a facultative preposition, but do not require one (for YUK cf. Smailus [1989: 152], cf. Stuart and Houston [1994: 7-13] for the 'place name formula') in spoken language. Compare Figure 141 with the cases of **OCH ti/ta HA'** < *och-Ø[-i] ti/ta ha'* (Figure 142d-e)[884]. Also compare the clauses in Figures 142a-c that all refer to a deity descending from heaven (or a heavenly place). All examples are after Zender (2005b), but I arrive at different analyses.

The first do not apply a preposition, but it can be reconstructed: *e[h]m-Ø[-i]*$_{\text{PRED}}$ *[ti] chan*$_{\text{PREP}}$ *it-zam yej*$_{\text{AGENT}}$, "*Itzam Yej* descended (from) the heaven" and *e[h]m-[e]y-Ø*$_{\text{PRED}}$ *[ti] wak-chan-nal*$_{\text{PREP}}$ *te'?*$_{\text{AGENT}}$ *y-ebet-Ø*$_{\text{PRED}}$ *itzam*$_{\text{AGENT}}$, "*Te'* [the *Pax* God] descended from the Six-Sky-Place, he is the messenger of *Itzamnaj*." Also note that *e[h]m* in the phrase from the Amparo Throne is inflected with the *–ey* suffix (Figure 137b-c), thus a finite verb form and not a compound. Finally, proof of the inherent prepositional construction comes from the third example: *e[h]m-Ø[-i]*$_{\text{PRED}}$ *ta chan*$_{\text{PREP}}$ *jun ye[j]-nal cha[h]k*$_{\text{AGENT}}$, "*Jun Yej-Nal Chahk* descended from the heaven."

A prepositional phrase as the indirect object of an intransitive verb is well attested in other contexts, e.g. *a[h]k't-aj-Ø*$_{\text{PRED}}$ *ti jas-aw chan*$_{\text{PREP}}$ *ux winikhab ajaw yaxun ba[h]lam*$_{\text{AGENT}}$, "the 3-*K'atun*-Lord *Yaxun Bahlam* became dancing with the 'flapstaff'" (YAX Lnt. 9, A4-B4), confirming the syntagma as in the above cases. The prepositional construction is also the only way to explain a possessive phrase in the 'compound'. See **OCH u=CH'EN^{na} ?** < *och-Ø[-i]*$_{\text{PRED}}$ *[ti] u-ch'en*$_{\text{PREP}}$ *?*$_{\text{AGENT}}$, "NN entered (into) his cave" (Figure 141b) and **OCH yo=OTOT u=KAB^{ba} ITZAM?-na** < *och-Ø[-i]*$_{\text{PRED}}$ *[ti] y-otot u-kab*$_{\text{PREP}}$ *itzamna[j]*$_{\text{AGENT}}$, "*Itzamnaj* entered (into) the house of his bees/honey" (Figure 141f).

[884] These two examples from the Dresden Codex are not metaphorical expressions for 'death'. A third parallel statement on C Dr. 69, D11 is without the preposition. The agent to enter into the water is a counted calendrical unit, and the expression may rather act as a arithmetic operator (Callaway 2011: 158).

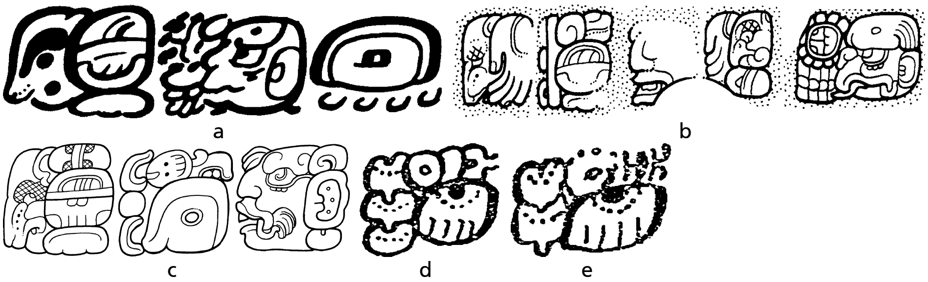


Figure 142: Examples of intransitive verbs of motion without and with prepositional phrases. **a) EM CHAN^{na} ITZAM ye-ji** (COL K1226, D3-E4), **b) EM=ye 6=CHAN^{na}=NAL TE' ye=EBET^{ta} ITZAM?** (COL Trn. Amparo, A2-C1), **c) EM ta CHAN^{na} 1=ye=NAL CHAK** (PAL TC, D7-D8), **d) OCH ti HA'** (C Dr. 61, B12), **e) OCH ta HA'** (C Dr. 70, D13).

The re-interpretation also has implications on the morphological analysis with regards to the temporal deictic enclitics. As an example for the full *=ij=iy* enclitic, Wald (2000: 144-145, fig. 11) detailed the verb of TRT Bx. 1, F2 (Figure 78k) and analysed: "**OCH-b'i-ji-ji-ya** [...] *och b'ij-Ø-iji(y)*", where his transliteration mirrors the actual grapheme reading order within the block. With the new approach, one possible transliteration and analysis is: **OCH=ji=ya BIH^{ji} BALAM AJAW** < *och-Ø=[i]j=iy [ti] bih ba[h]lam ajaw*, "after *Bahlam Ajaw* entered (onto) the road". However, **OCH=BIH=ji=ji=ya** < *och-Ø+bih-[a]j-Ø=ij=iy*, "after *Bahlam Ajaw* became road-entering" remains a (more) viable analysis, assuming an inchoative compound, because (1) of the **=ji=ji** sequence used elsewhere (Figure 74), and (2) considering the graphotactics, as the grapheme ACN is not attested to enable superimposition.

The fallacy of the 'intransitive compounds' is thus graphotactical, and only in very few instances, these compounds are truly linguistic. The majority of cases can be resolved with a prepositional phrase, hence we can in fact or mentally add *ti* ~ *ta* after the verb in these cases. This is only a solution for root intransitives, and still leaves expressions like *chum-tun* ('positional compounds') unexplained.

4.1.15 – Versive Suffix –*Vy*

Related to the mediopassive derivation (Chapter 4.1.12) is the 'general versive' out of which the mediopassive likely developed. A CHL reflex *–iy* ~ *–ʌy* with limited productivity is described in Chapter 3.1.4.1. With epigraphic attestations of such a *–Vy* suffix with substantival and adjectival roots also from areas outside the western Maya area, it cannot be considered as a CHL or WCh vernacular. ClM thus features a reflex of this pGT 'general versive' that only survived with two allomorphs in CHL.

The discussion of the epigraphic examples has to consider the derivational bases and spelling patterns to attempt to define the phonology, guided by the CHL forms. The statistical analysis (Chapter 3.3.3.4.3) reveals only a very small sample set not suitable for any solid quantitative assessments. Although the preferred suffix spelling pattern was determined as **=yi** __# (Table 73), some deviations by other **=yV** / __# syllabograms let a significance test fail due to the small sample size. If the mediopassive developed out of this 'general versive', then it presumably reflects a similar phonology and morphology. This makes a **CV=yi** / __# spelling to indicate a *–Vy-i* suffix chain, where *–i* represents the thematic suffix preserved in ECh. Spellings with =**yV** / __# require its reconstruction.

Some examples exhibit a full syllabic or a mixed spelling that is suitable to provide a full phonemic, integrative spelling (Figure 143). Although considered as group 1 spellings, comparison with other spellings does not necessarily strengthen this assumption: **KUCH** otherwise uses **chi** as a disharmonic phonemic complement (compare Figure 143a with 76a). While **pi-bi** is the usual synharmonic spelling for *pib*, it is spelled disharmonically with the versive (compare Figure 143d with 91c). Other cases (Figure 143b-c) remain root synharmonic.

Two patterns are visible among the examples providing a root coda syllabogram: **CV-Ci=yi** and **CV-Ca=yi** that may render *CVC-iy-i* and *CVC-ay-i* forms. Such vocalisation would be in accordance with the CHL evidence, indicating that the 'general versive' is not necessarily root vowel harmonic (thus rather being a test group 3 case). Just four examples do not allow to determine preferences, but alterations between front and back vowels may appear (e.g. *kuch-iy-i* and *pib-ay-i*), but not necessarily (e.g. *k'ik'-iy-i* and *naj-ay-i*), and other constraints (such as the sonority of the root coda) might come into play.

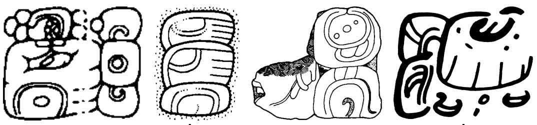

a b c d

Figure 143: Examples of versives with integrative root spellings. **a) KUCH-chi=yu** (TIK T. 4 Lnt. 2, B11), **b) k'i-k'i=yi** (PUS St. D, F8), **c) na-ja=yi** (PAL T18S, 158)[885], **d) pi-ba=ya** (NTN Dwg. 65, G5).

Examples with a pure morphographic root spelling (Figure 144) spell a *CVC-[V]y-i* form by a scheme 2.e.ii **CVC=yi** spelling. These impose the problem of the vowel reconstruction, as it is not possible by our current phonological understanding. However, I would like to propose *ajaw-[a]y-i* for Figure 144a and *motz-iy-i* for Figure 144b-c.

Figure 144e provides an example with the *=iy* enclitic, which as a scheme 2.f.ii evokes a syncopation of the *–Vy* intransitiviser, hence this example can be transcribed as *pet-y-Ø=iy*, "after it became round." Such process is also taken in parallel to the morphophonemics of the mediopassive.

[885] See footnotes 367 and 394 for a discussion of the root *naj*, "full, satisfied" as a WCh vernacular adjective, although a mediopassive was discussed by Wald (2007: 303-306) based on CHL lexical evidence.

a b c d e

Figure 144: Examples of versives with morphographic root spellings. **a) AJAW=yi** (TNA Mon. 126, B4a), **b) MOTZ?=yi** (TRT Mon. 6, L5)[886], **c) IX MOTZ?=yi** (YAX St. 7, pD6), **d) IX YAX MOTZ?=yi** (PAL PT, D15), **e) PET=yi=ya** (CRN P. 1, O1a)[887].

Some samples of the 'general versive' also feature parallels among inchoative examples (Chapter 4.1.3). Of special interest is the substitution of *kuch-iy-i* (Figure 143a) with other 'palanquin events' with the ECh *kuch-t-aj* inchoative (Figure 76a-b), but also compare Figures 144a with 73a for *ajaw* and 144e and 75d for *pet*. The small amount of samples suggests a non-productive suffix for a limited range of lexemes, thus the distinction to *–aj* may be lexical or affected by idiosyncrasies. Or the low frequency is the result of a lesser preference in contrast to the proper inchoatives on *–aj*, also related to the rhetorics of the inscriptions[888].

The regular *CVC-Vy-i-Ø* forms of the 'general versive' result in a trisyllabic form *[CV.CV.ji] of open light syllables, e.g. *k'ik'-iy-i-Ø* as *[k'i.k'i.ji]. Otherwise, the same phonetic considerations of a dissimilation and sound reinterpretation of the thematic may apply as among the mediopassive (Chapter 4.1.12), e.g. *[pi.ˈb'ʌj^{ə}] for *pib-ay[-i]-Ø*.

The examples may also allow a further adjustment of the functional and phonological history of the suffix in comparison with the assumptions made in Chapter 3.1.4.1. The versive/inchoative pM *–*er* > pWM *–*ey* > pGT *–*iy* ~ *–*ay*, from where it potentially lost its productivity in pCh. At the same time, pCh innovated *–V_1y to replace the pGT *<*h*> as the mediopassive, shifting *<*h*> to the passive. With the cross-dating of the earliest ClM mediopassive and passive forms (Figure 133), this process must have taken place before 8.11 (~ 258 AD).

The discussion of the mediopassive (Chapter 4.1.12) and certain intransitive verbs (Chapter 4.1.13) in connection with –V_1y ~ *–Vy* suffixes has some interesting typological implications with the 'general versive' examples presented here, as well as the regular *–aj* inchoative (Chapter 4.1.3)[889]. It concerns a broader 'anticausative' perspective as a certain rhetoric device that can be realised by semantically similar grammatical processes. Although the 'anticausative' calls for a transitivity alteration, Haspelmath (1987: 5) specifies that it is not "a general, unspecific intransitivization but, with that particular type of intransitivization in which the actor is deleted and the undergoer becomes a subject."

886 For a possible syllabic substitution and inchoative derivation of the sign XGF see footnote 695. The morphographic reading **MOTZ** was proposed by Luís Lopes (cf. Gronemeyer and MacLeod 2010: fn. 59).

887 A clear distinction between 1M1 **ji** and ZUH(1) **yi** is difficult to make in this case. As the style is somewhat closer to the allograph ZUH(3), I tend to read **yi** in this case. However, the monument dates to *K'atun* 9.12, while ZUH(3) is a late addition to the graphemic lexicon especially used in early Post-Classic Yucatan (e.g. Figure 127l), but also compare to **T'AB=yi** on the Fenton school vessel K558, B1.

888 If the use of a rare intransitiviser is connected to its limited productivity, then earlier inscriptions may exhibit this suffix more often, likewise (much) earlier context dates. The data do not support such a pattern.

889 The perspective could even be broadened to other suffixes, such as the *–an* inchoative (Chapter 4.3.4.2), but also possibly intransitive positional marking by *–laj* ~ *–wan* and their potential <*h*>…*-aj* (Chapter 4.1.2) and –V_1y (Chapter 4.1.16) vernacular forms. As the transitive positional *–bu* is a true causative (the agent causes the patient to become into a position), intransitive positionals are thus a morphological anticausative.

The syntactic agent as the semantic patient is also fulfilled with nominal intransitivations, although no demotion takes place[890], but consider the positional derivation as both causative/anticausative.

All these suffixes, whether they derive a transitive or a nominal root, in one way or the other emphasise certain features: (1) the animate or inanimate semantic patient is affected by a physical change of state, and (2) the cause is self-induced and the action only affects the semantic patient. Anticausatives are always telic (Haspelmath 1987: fn. 5), thus the actions have endpoints, but may emphasise and describe punctual moments in the activity, such as the beginning (e.g. inchoative) or the end or result (e.g. intransitive positional, mediopassive).

As the hieroglyphic inscriptions (especially the monumental ones) apparently tend to record completed actions, their rhetoric seems to prefer to express events and actions by telic verbs. This may explain such a large variety of 'anticausative' forms attested in the texts, together with such a large number of attestations. At the same time, the choice of a specific intransitivation from this 'anticausative' set is still able to accentuate different stages of the completed action[891].

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890 Haspelmath (1987: 6-7) acknowledges the passive to fall under a broad definition of the 'anticausative' as well, also pointing out that the passive often shares similar morphological markings with other anticausatives. This was also detailed in Chapter 3.1.1 between the passive, intransitive positional and inchoative. However, Haspelmath sees one important semantic difference: a passive still implies an agent, who can eventually be reintroduced (as done by the secondary verb *u-kab-aj* in ClM, see Chapter 4.1.19). While such does indeed not appear with the mediopassive, such definitory demarcation would affect inchoative and versive intransitivations: *pet-aj-Ø y-uxul-ul*, "it became round his carving" (CHN ADZ-LF, B2) implies the work of a sculptor, *siy-aj-Ø*, "he/she became a gift" requires a mother to give birth. But interestingly, a context analysis of inchoatives and versives does not exhibit any mention of the agency, it just focuses on the animate or inanimate undergoer of the action. But considering the above examples along the opposite process of an 'anticausative', when "the subject of the intransitive becomes the object/undergoer of the causative" (Haspelmath 1987: 5), then there is ample justification to consider the inchoative and versive as an 'anticausative' verb form. And above all, as the variations between passive and mediopassive verbs (Figure 133) show, it can be a deliberate choice to cloud the agency of an action. Furthermore, 'anticausatives' are distinguished by their unspecific change of state that is not caused by conscious action. They are therefore related to the inchoative as a derivation from adjectives that qualify a natural state (Haspelmath [1987: 19, 33] uses the term 'fientive' to refer to what 'inchoative' is used for in this study).

891 Thinking this further through, the morphology and functional development of certain suffixes could be explained by a totally different approach (see footnote 819 on ClM root classes in comparison with the Egyptian 'standard theory'). The CHR lexical survey (Wisdom 1950) for inchoatives ending on /ih/ ~ /Vh/ (footnote 676) yielded not only nominal bases for intransitivations, but also root intransitive verbs ending on /ih/ ~ /Vih/. Some of these clearly indicate the VER.INTR thematic suffix *–i*, compare *tar*, "a coming, arrival; come" with *tarih*, "come" (Wisdom 1950: 664). Another set correlates to those ECh intransitives with a *–V_1y* [+COM], however these entries form pairs with a correlating nominal root, e.g. *lok'*, "leaving, departure (*salida*), a coming up or out, escape" with *lok'oih*, "leave, go away, come out (as from the body), result" (Wisdom 1950: 514, 516). The other entries are: *bur/buruih*, *cham/chamaih*, *chab/chabaih*, *hop/hopoih*, *kar/karaih*, *k'ot/k'otoih*, *ok'/ok'oih*, *och/ochoih*, *top/topoih*, *t'ab/t'abaih*, *tz'am/tz'amaih*. Another set comprises of intransitives verbs that do not feature a root harmonic suffix, but likewise form a noun/intransitive pair, e.g. *ehm*, "a descent, a going down" and *ehmaih*, "go down, let itself down" (Wisdom 1950: 457). The other entries are: *bahk/bahkoih*, *butz'/butz'aih*, *em/emaih*, *ek'em/ek'maih*, *ohom/ohomaih*, *os/osaih*, *sihk'/sihkuih*, *sis/sisaih*. In contrast of the first group, some of these are non-CVC forms. There can be no doubt that Wisdom's /Vih/ orthography is identical to *–Vy*, but the question remains why it is applied. – It could be analytical, leading me to a provoking chain of thought: the entire intransitive verb system could derive from nominal roots. Hereby, the *–i* [+COM] thematic is the remnant of an **–ij* inchoative (reflex of the pGT **–ij* intransitiviser [Kaufman and Norman 1984: 105]). This consideration would leave *–el* [+INC] as a nominal form (possibly related to ~ *–el* discussed in Chapter 4.1.18) and explain split ergativity (see footnote 440, as in accordance with intransitive positionals, see footnote 169). And if the CHR data are interpreted in such way, this would leave the 'general versive' not as a non-productive suffix (see footnote 367), but as very productive, if not in CHL, at least in CHR. The above line of thought suggest that at some pre-pCh stage, **–ij* underwent a functional split with a lenition process and vowel assimilation: as **–i* (with [x] > [Ø]), it became the intransitive thematic for most verbs; as **–V_1-ij* > **–V_1j* > **–V_1y* (with [x] > [j]), it became the

While the typological implications of the 'general versive' reach far beyond the scope of this study, the phonology and morphology can be summarised briefly, due to the limited epigraphic data. Rather than summarising paradigmatic spellings, Table 85 lists the spelling variations we have.

Type	Transcribed Paradigm	Canonical Spelling
-INCH (non-)CVC NOUN,ADJ	*CVC-iy-i-Ø* *CVC-ay-i-Ø* *CVC-[V]y-i-Ø* *CVC-y-Ø=iy*	**CV-Ci=yi / CVC-Ci=yu** **CV-Ca=yi / CV-Ca=ya** **CVC=yi** **CVC=yi=ya**

Table 85: Morphological paradigms and canonical spellings of versive marking.

4.1.16 – Intransitive Positional Marker –V_1y

The discussion about the pTz vernacular *–V_1y intransitive positional suffix could be circumscribed as the non-existent showcase. The linguistic forms presented in Chapters 3.1.1.2 and 3.1.4.2 and the deduced spelling schemes (Table 15) find no clear reflection in the hieroglyphic record. Indeed, only one example (Figure 129f) of a positional root with a =**yV** / __# syllabogram was found, outside the suspected area of spoken Tzeltalan and with a more suitable analysis as a transitive (see footnote 395). The examples with =**ji-ya** / __# cited by Lacadena and Wichmann (2005a: 35-36) in favour of *–V_1y are considered to pertain to the other pTz intransitive positional marker that is attestable in the hieroglyphic record as *<h>…-aj (Chapter 4.1.2).

The absence of *–V_1y has several implications for the historical configuration of pTz: (1) the linguistic reconstructions by Kaufman (cf. Mora-Marín 2005b: 31) or Robertson (2010: 7-9) are inapplicable; but if not (2) the use of the suffix in spoken language lies outside the time frame of the hieroglyphic writing tradition; or (3) the suffix was not used in favour of the pTz *<h>…-aj, taking into account the low frequency of this form (Figure 65).

As the putative *–V_1y intransitive positional marker is absent in the epigraphic record, this study will not pursue the development of this suffix, as it does not contribute to its objectives. Likewise, the lack of epigraphic evidence also does not facilitate to cross-check the development of this suffix not only in the Tzeltalan branch, but also in its pGT ancestor and Ch'olan sibling.

'general versive' for CVC intransitives of motion or change of state, at least reflected in ECh. This still makes the mediopassive a later functional shift of the 'general versive', causing its vocalisation to restrict itself to *–iy* ~ *–ay*, while –V_1y continued as the mediopassive. This reconstruction and consideration of intransitives as of genuine nominal origin is of course only a brief sketch of thoughts pending a more thorough review. But it also has appeal from a typological point of view: it would make all 'root intransitive' verbs 'anticausatives' of nominal roots, strengthening the impression that the distinction in Mayan is primarily morphological and not lexical (see footnote 364).

4.1.17 – Instrumental Suffix *–Vb* ~ *–b*

The interpretation of the samples involving the instrumental suffix has to focus on a variety of phonological, morphological, morphophonemic, semantic and orthographic constraints. As the linguistic data in Chapter 3.1.5 show, the suffix vowel is not entirely arbitrary, but overall limited to the two alloforms *–ib* ~ *–ab* in Ch'olan, with only other seldom *–Vb* forms (Table 51). The statistical analysis in Chapter 3.3.3.5 already raised the question how these are predictable by the lexeme, its root vowel and semantics, intermediate intransitivations, and how do these factors are influenced by morphophonemic processes (primarily vowel syncope)?

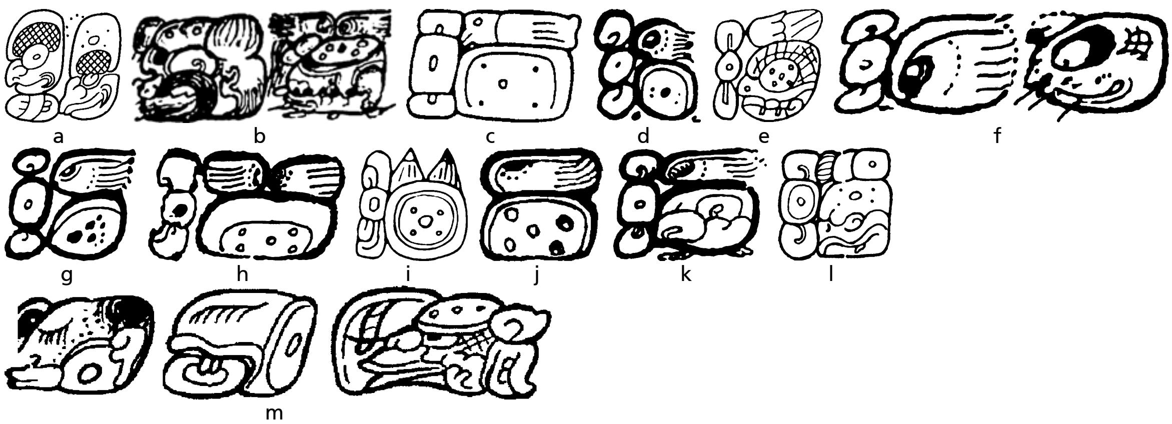

Figure 145: Examples of instrumentals with integrative *–ib* root spellings. **a) o-ki=bi** (T21B-E, 32)[892], **b) u-k'i=bi** (COL K1183, D1-E1)[893], **c) yu=k'i=bi** (OXK K3199, G1), **d) yu=k'i=bi** (XUL K3500, A1), **e) yu=k'i=bi** (EKB Msc. 5, A2), **f) yu=k'i=bi** (COL K8660, E1-F1), **g) yu=k'i=bi** (XUL K4387, E1), **h) yu=k'i=bi** (COL K4964, G1), **i) yu=k'i=bi** (PAL K4332, A1), **j) k'i=bi** (COL K8234, L1), **k) yu=k'i=ta** (COL K7912, C1)[894], **l) yu=ti=bi** (PAL TI-W, K4)[895], **m) u=WE'=i-bi** (COL K6080, H1-J1).

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[892] There is some uncertainty regarding the root's lexical class. Phonologically, it should be the noun *ok*, "foot", but nouns are regularly not able to form an instrumental in Ch'olan (see Table 51). However, all instances of instrumental *ok* originate from Palenque. Following the line of argumentation brought forward by Stuart (2005b: 92-93), Palenque apparently exhibits several equalisations of [k] ~ [ʧ] and [k'] ~ [ʧ'], also see footnote 799 for ~ *k'am* spellings and compare to rendering of the name of *K'inich Kan Bahlam* (e.g. PAL PT, M12). If so, it would be the Palenque form of ClM ~ *och*, "to enter", which can derive an instrumental as an intransitive. On PAL T21B-P, I1-M1, *okib* is part of the youth name of *Ahkul Mo' Nahb* III, likewise it is part of a youth's nominal phrase (of *Upakal K'inich*?) on PAL T21B-E, 32-33. In another example, it appears in the proper name of the *sajal Balun Okib* from the site of *Ux Te' K'uh* (PAL T19B-W, J1-M1). As Stuart pointed out, other contexts of the possessed form (Figure 154a) indicate a physical object in dedication phrases, such as *pat-wan y-ok-b-il* on PAL T19B-W, B2-A3. An interpretation as "entrance" or "pedestal", as proposed by Stuart, must remain speculative.

[893] One specific problem of painted ceramics, as in the present example, are the frequent dots, often paired or tripartite, underneath some specific syllabograms that may indeed represent a discrete sign, or are just decoration. This question becomes important when these dots can be considered as allographs of **la** and thus indicate a grammatical function and thus affect considerations on spelling schemes. I generally deny them a phonological nature as a discrete syllabogram for a couple of reasons. The dots appear among signs where an additional **la** must be excluded, e.g. with **u=tz'i-bi$_{\text{DOTS}}$=na=ja** < *u-tz'i[h]b-n-aj-a[l]* on K4669, A2-B2. In **yu=k'i=bi$_{\text{DOTS}}$** < *y-uk'-ib* (K4644, E1), it might be possible by morphosyntactic considerations, but the **ta yu=ta=la** < *ta y-ut-al* spelling directly following represents **la** quite different. Also, the dots may appear to span underneath a whole block, e.g. along **u=tz'i-bi=$_{\text{DOTS}}$na=ja$_{\text{DOTS}}$** < *u-tz'i[h]b-n-aj-a[l]* (K4689, C1-F1), where a **la** sign might provide a full spelling, but underspellings in this context are frequent. Especially compare to the Xultun vessel K4909, where multiple co-occurrences of the dots and true **la** signs in various alloforms can be found. Also see footnote 914 about the inflection patterns of *y-uk'-ib* depending on the syntagma.

[894] This is one a few plain spelling errors, where **bi** is replaced by some other grapheme. Also compare with **yu=k'i=TE'** on K5016, F1 and **yu=k'i=tzi** on a polychrome vessel from the Museo Santa Barbara.

[895] Proposed translation for *ut*: "to fructify, to bear fruits". The best evidence comes from CHT with <fructificar. *xuutil* l. *utiel*, v.° neu.°> (Morán 1685-95: 115). As an intransitive verb, it can directly derive an instrumental

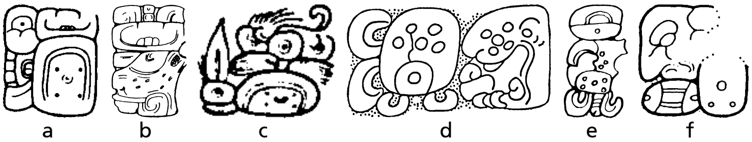
The patterns discovered and conclusions drawn for the figures in Chapter 3.3.3.5 are discussed in the following to explain the interpretation of the orthographic data. Each spelling group review separates after the assumed alloforms for easier comparison of the underlying constraints. Specific schemes reflecting special processes of derivation and morphophonemics are separately discussed. With =**bi** / __# as most common suffix spelling (Table 73), its application is taken as the standard case, other =**bV** / __# patterns are summarised as deviant cases.

To spell the *–ib* allomorph, the standard pattern is synharmonic (Figure 145), while any root, that is not CiC or is spelled disharmonically with a **Ci** sign, requires a spelling alteration: **CV_1-CV_1 / $CV_1C^{CV_1}$** > **CV_1-Ci=bi / CV_1C-Ci=bi** for a *CV_1C=ib* form (with intransitive verbs, the morphophonemics of passives is discussed further below). These samples exclusively classify as schemes 1.b.i and comprise the largest quantity because of the *uk'* instrumentals. The integrative nature can be demonstrated in comparison with spellings and different suffixes from other showcases, compare Figure 145b-l with 117d. Two samples of scheme 1.e.i apply a **CV'** morphograph for the root, but still spell out the suffix by =**i-bi** (Figure 145m), thus following the pattern attested among other showcases (see Figures 84c, 90m, 127e). The two lexemes attested refer to physical objects.

Examples that spell out *–ab* by a fully integrative spelling (Figure 146) exclusively do with CaC roots with **Ca-Ca=bi / CaC-Ca=bi** for a *CaC-ab* form, classifying as scheme 1.a.ii. Two of the three lexemes, *a[h]n* and *way*, entirely occur within nominal phrases, indicating a personal title, social role or office[896]. The meaning and context of the third root, *kam*, is unclear.

with a possible meaning "fertiliser, inseminator". Less likely is a relation to the CHR verb *huhta*, "blow the breath" and its instrumental *huhtib*, "bullet" (Wisdom 1950: 472). In the context, *Balun Tz'ak[bu] Ajaw* appears as the *y-ut-ib* of three distinct individuals (the second is *K'inich Janab Pakal*). It is a numen associated with ancestry and fertility, and possibly a hybrid aspect of *Chahk*/*K'awil*, according to Seler (1902-23, I: 377 [emphasis original]): "Es unterliegt gar keinem Zweifel, dass dieser Gott *Ah bolon tz'acab* in engster Beziehung zum Regengotte steht. Wir werden ihn am richtigsten wohl als Gott des Wassers bezeichnen." Also compare to Landa (1959: 63): "[…] elegían un príncipe del pueblo, […] hacían un estatua de un demonio al que llamaban *Bolonzacab*, la que ponía en casa del príncipe, aderezada en lugar público y al que todos pudiesen llegar." It is clear that *Balun Tz'akbu Ajaw* acts as the 'enabler' to rejuvenate the deceased *K'inich Janab Pakal* among two other receivers (when interpreting the context with the iconographic background of the 'Transfiguration Tripod' COL Berlin IV Ca 49845). Also see NAR St. 38, A3-A4, where *Aj Wosal* as an ancestor is referred to as *Balun Tz'akbu Ajaw* as well. Despite the fact that *y-ut-ib* is an 'animated instrumental' (see below), the syllabic spellings clearly indicate *–ib* instead of *–ab*.

[896] The *way-ab* title can be specified (Figures 146e-f, 149), e.g. *chit way-ab*, *ch'ok way-ab*, *bah way-ab* (cf. Beliaev 2004: 137-138), and indicate specialisation and stratification among *wayab* persons. The other cases in personal names are more complex (cf. Beliaev 2004: 138-140), but can also only be interpreted as agentive / animated, such as *k'inich taj wayab*, "Hot Torch Dreamer".



a b c d e f

Figure 146: Examples of instrumentals with integrative *–ab* root spellings. **a) a-na=bi** (LAC P. 1, D2)[897], **b) ya=na=bi** (PNG Bur. 13 Stucco, A1a), **c) ti ka-ma=bi** (TIK MT. 11, pB1)[898], **d)** ^{wa}**WAY-ya=bi** (COL P. Berman, A6-B6), **e) CHIT WAY-ya=bi** (PAL PT, F12), **f) ch'o-ko wa-ya=bi** (COL P. Stokes, E1).

Alloforms other than *–ib* ~ *–ab* are only attested with two syllabic spellings for *juk-ub*, "canoe" (see footnote 421 on the etymology). As the suffix vocalisation *–ub* is secured by a broad cognate set (Kaufman 2003: 995), the **ju-ku**=**bi** spelling, classified as scheme 1.a.ii, leaves little doubt for the pronunciation. No mixed spelling is known, as the morphograph ZVF apparently is **JUKUB** already. Also because *juk* is a transitive root, this instrumental appears fossilised and lexicalised by ClM times, thus not featuring a sign of intermediate intransitivation that was innovated in Ch'olan (as possibly with *uk'*, although a few cases are known, see Figures 152g-h).

a b

Figure 147: Examples of instrumentals with other integrative *–Vb* spellings. **a) ju-ku=bi** (CML U. 26, Sp. 11, A3), **b) ju-ku=bi** (PNG P. 2, Y3).

Cases with morphographic root spellings for a supposed *–ib* suffix vocalisations (Figure 148) are relatively rare. These **CVC**=**bi** spellings require reconstruction for a *CVC-[i]b* form and generally classify as scheme 3.a.i. One exception (Figure 148a) provides a non-integrative spelling by a phonemic complement, this case of the positional *chum* was discussed by Wichmann (2002a: 16-17) as indication of a potential CHR vernacular (see footnote 404). In the cases with *uk'* (Figure 148b), the abundant

[897] See footnote 431 on previous interpretations of the title and preliminary considerations. The analysis of 23 examples likely excludes any interpretations that base on an agentive segmentation with *aj* by graphematics, regional distribution, inflectional morphology, and comparative orthography. It has been argued that AL2 **a** served as acrophonic **AJ** in the Usumacinta region, where many examples originate from. But the spelling with AL2 is exclusive, no spelling with 1G4 is found in other regions. When possessed or appearing in predicative position, the spelling always changes to **ya**=**na**=**bi**=**li** or similar (Figure 153a-d), except one underspelling **ya**=**na**=**bi** on PNG Bur. 13 Stucco, A1a (Houston et al. 1998: fig. 3). Possessed agentive expressions with *aj* never show a possessive *–Vl* suffix, e.g. **ya**=**K'UH**=**HUN**^{na} on K4669, A5 or **ya**=**ja-wa**=**K'AK'** on PAL T19B-S, V2 (cf. Zender 2004c: 172-173,195-210). Intransitive spellings of *a[h]n* (see Figures 137a, 143d) and other nominalisations (Figure 157b) always show a corresponding **a-nV** root spelling that matches the **a-na** among the instrumental. The provides good support to analyse the title as *a[h]n-ab* ~ *y-a[h]n-ab-il* (see below) with Beliaev's (2004: 127) translation as "runner". As a personal title, the instrumental makes the person perhaps some 'enabler to run' (in a game? or as a messenger?), considering the possible fourth category of instrumentals (see footnote 407) that has special appeal in relation to 'animate' instrumentals. But the exact meaning and the person's function must remain opaque. CHL has *ajnibʌl*, "lugar" (Aulie and de Aulie 1978: 4) with an additional locative suffixation (literally 'a place where running is enabled'), but without necessarily illuminating the meaning of the title.

[898] No satisfactory translation can be given for *kam*, as no reasonable intransitive cognate can be found. The only evidence for a transitive verb is CHL *cʌm*, "agarrar o llevar (con la boca)" (Aulie and de Aulie 1978: 14) and CHN *cäme'*, "agarrar (con el pico, con los dientes)" (Keller and Luciano 1997: 57). The sample context is not able to provide support for such meaning.

syllabic substitution do no leave any doubt about *y-uk'-[i]b*. In the case of *way* (Figure 148c), careful distinction must be made depending on the context (Beliaev 2004: 136)[899].

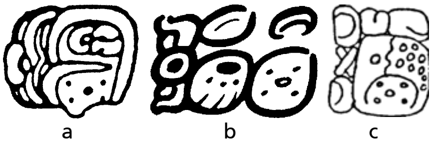


Figure 148: Examples of instrumentals with morphographic *–[i]b* root spellings. **a) u=CHUM^{mu}=bi** (CPN Str. 10K Hbh., E1), **b) yu=UK'=bi** (COL K1226, A1), **c) u=^{wa}WAY=bi** (CPN T. 22 Stone, D1).

All examples of an inferred *–ab* vocalisation among morphographically realised roots (Figure 149) with the standard suffixation pattern classify as scheme 3.a.ii with **CVC=bi** for a *CVC-[a]b* form. All such inferred cases occur with *way* in nominal phrases and find substitutions with integrative spellings (Figure 146d-f).

Figure 149: Examples of instrumentals with morphographic *–[a]b* spellings. **a) ba ^{wa}WAY=bi** (ZPB K4692, B6), **b) CHAK TOK WAY=bi** (SUF M. 9, C3), **c) ch'o-ko WAY=bi** (ALM St. 10, Yp1), **d) IX WAY=bi** (COL K5164, I3), **e) K'AN^{na} to-ko ^{wa}WAY=bi** (YAX Lnt. 8, D1-D2), **f) K'INICH TAJ WAY=bi** (PAL TS, D1), **g) YAX WAY=bi** (COL Yax Wayib, B3).

If the instrumental suffix is spelled out, only few examples deviate from the standard =**bi** / __# pattern (Figure 150). Except some unclear readings (Figure 156), all examples are integrative spellings with =**ba** / __#, with no clear patterning with respect to the root or suffix vowel. The attested samples either spell a 1.a.i or 1.b.i scheme **CV$_1$-Ca=ba / CV$_1$C-Ca=ba** or a 1.b.ii scheme **CV$_1$-Ci=ba** for a *CV$_1$C-ib* or *CV$_1$C-ab* form. Two singular samples with otherwise unattested lexemes (Figure 150b-c) also provide *–ab* with physical objects[900].

[899] When possessed (sometimes in a prepositional phrase, and otherwise with a *–Vl* possessive suffix, see Figure 153h-i), reference is made to a "sleeping place, dormitory, domicile" as a deity / lineage shrine (cf. Freidel, Schele and Parker 1993: 188-193, Houston and Stuart 1989: 9-13, Stuart 1998: 399-401). The reconstruction of the instrumental suffix depends on the author, while Houston and Stuart (1989) prefer *–ab* because of fully integrative spellings, Stuart (1998) later switches to *–ib*, as it is also preferred by Beliaev (2004). Interestingly, no example of the "dormitory" contexts provides a **ya** syllabogram which would support **way-[a]b*, except in Figure 154b (which has two possible explanations, see below). The preferred omittance of **ya** here may be considered an orthographic convention to indicate *way-[i]b* in addition of the context. In accordance with Beliaev, I consider *way-[i]b*, as it refers to a physical object or place instead of a personal title.

[900] Lexical evidence allows to confirm the *–ab* vocalisation and thus an integrative spelling, at least in the Ch'olan branch for the instrumental "rattle" of *chik*, "to tremble", cf. CHT <*chicab.*>, "sonajas" (Morán 1685-95: 165), *chikab'*, "sonaja de la cascabel, chinchín" (Pérez Martínez 1996: 42), while lexical evidence is absent in WCh. For *lajab* as "drum", cf. CHL *lajlaj*, "palmeando, golpeando" and *lajte'*, "tambor" (Aulie and de Aulie 1978: 48, 49), CHN *laje'*, "hacer, echar (tortillas)" ([Keller and Luciano 1997: 147], note how tortillas are made by hand), *lah*, "to pat" (Knowles 1984-88), these examples connect to a WCh transitive verb *laj*. As no overt intransitiviser is visible, a passivation might take place. CHR in contrast has *lahbah*, "rub palms together, pat one's hands, play a flute" and *lahba*, "pat or rub with the palms, touch, massage, erase" (Wisdom 1950: 511), where *lahb-a* is a derived transitive verb. As the sample context of the drum is unclear, the example may also be analysed as a transitive verb *u-la[h]b-a-Ø*, "he pats (=plays) it", where **ja** indicates the stem-internal spirant (if /j/ ~

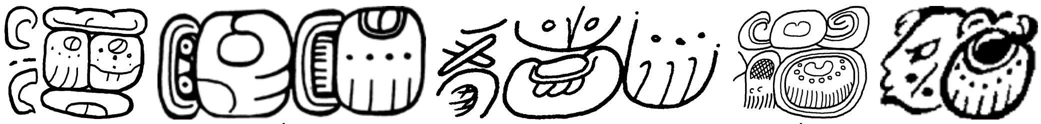

a b c d e

Figure 150: Examples of instrumentals with spellings deviating from the standard pattern. **a) ya=na=ba=tzi-li** (YAX St. 31, A2), **b) u=chi-ka=ba** (COL Rattle, A1-B1), **c) u=la-ja=ba** (PNG Drum), **d) yu=k'i=ba** (COL K5514, C1), **e) IX WAY-ya=ba** (COL K1382, F1).

Underspellings of the instrumental suffix (Figure 151) only comprise 29 cases, which is a relatively small number, especially when considering that most examples of *uk'* originate from formulaic PSS contexts. As far as the suffix is concerned (contrast to Figure 145j), three types can be observed: (1) **CV_1-Ci=Ø** < *CV_1C-i[b]* as scheme 1.g.i, also comprising those cases misspelling **bi** (Figure 145k); (2) (**yV_1**=)**CV_1=bi** < *(y-)CV_1[C]-[i]b* and also **CV_1C=CV_1=bi** < *CVC-C-[i]b* (Figure 152f) as scheme 2.g.i; and (3) (**yV_1**=)**V_1C=Ø** < *(y-)V_1C[-ib]* as scheme 2.g.ii. Substitution patterns (compare Figures 151a-e with 145b-i) and context (compare Figure 151f with 149b) indicate not only the instrumental function, but in most cases also the intended alloform.


a b c d e
f

Figure 151: Examples of instrumentals with different underspellings. **a) ᵘUK'** (COL K1339, A1), **b) yu=k'i** (COL K4988, I1), **c) yu=UK'** (ALH K2993,E1), **d) yu=bi** (COL K2669, I1), **e) yu=bi=li** (CRN El Jobillo Gr. 2 Vessel, D1-E1), **f) CHAK to WAY** (COL K2358, P1).

Instrumentals of detransitivised roots (Figure 152) comprise a couple of morphological processes. The paradigm of positional instrumentals with *–l-ib* via an intermediate intransitivation by *–l* was first confirmed in ClM by Wichmann (2002a: 6-11) on the basis of the examples in Figures 152b and d. As 1.f.ii samples, a =**li**=**bi** / __# sequence follows a synharmonic **CV_1-CV_1** or morphographic **CVC** root spelling for a *CVC-l-ib* form. Likewise, transitive roots preferably suffix =**ni**=**bi** / __# for an intermediate antipassivation with *–n-ib*, for a *CVC-n-ib* instrumental, mirroring the ECh *–n-ib* / WCh *–on-ib* pattern (Table 51). But in any case, these =**Ci**=**bi** spellings leave little doubt because of their syllabic nature that here the instrumental is *–ib*. Only one case (Figure 152f) not providing a straightforward spelling is found, but none that would indicate the WCh configuration of *–VC-ib*, strengthening the resemblance of ClM to the ECh phonological and morphological patterns. Other intransitivations are only attested with a singular, though speculative, =**yi**=**bi** / __# < *–y-ib* sequence of a mediopassive. Synharmony patterns are less distinct in these cases, for two reasons: many roots spell with

/h/). But the Piedras Negras provenance favours more an affiliation with a WCh base lexeme and thus an instrumental.

a morphograph, if syllabograms are used, either the lexeme (as in Figure 152i-m) or the morphology (Figure 152g-h) remain unclear.

Passivation remains another way to intransitivise, but the <*h*> derivational infix is unmarked in the orthography (see Chapter 4.1.1) and the *–aj* thematic as a secure indicator is elided in favour of *–Vb*. An intermediate passive must be inferred if the verbal root is transitive[901]. But any transitive CVC root will generally result in a *CV<h>C-Vb* form, unless morphophonemic conditions apply.

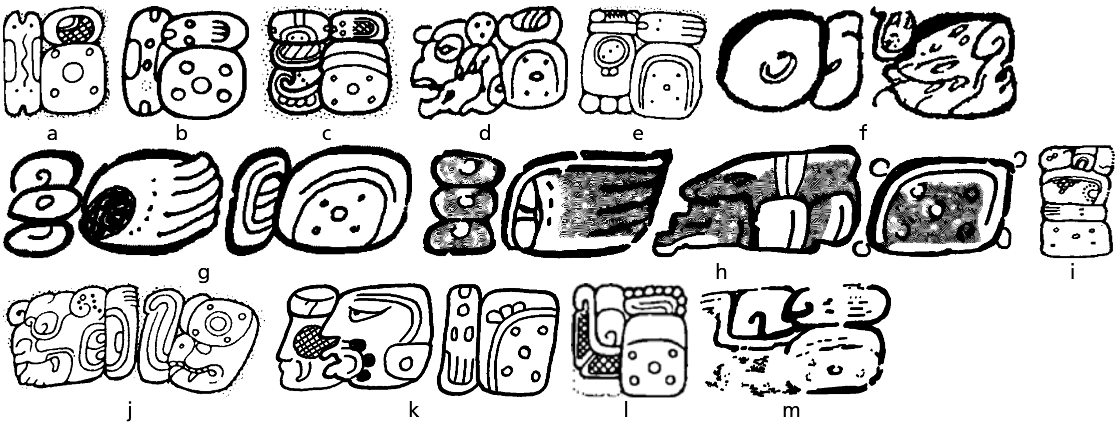


Figure 152: Examples of instrumentals with intransitivised roots of a *–C-Vb* pattern. **a) BAK=li=bi** (TRT Mon. 6, K10)[902], **b) CHAK=li=bi** (TNA Mon. 27, B2)[903], **c) CHAK-ka=ja=li=bi** (CNC P. 1, E7), **d) e-ke=li=bi** (CRN P. 2, O8)[904], **e) AJ ja-ma=li=bi** (YAX Lnt. 23, J1)[905], **f) PET=ne=bi** (COL St. Médard Vessel, A3-A4)[906], **g) yu=k'i=li=bi** (COL K5070, J1-K1)[907], **h) yu=k'i=yi?=bi** (COL K1379, J1-L1), **i) ?-**

[901] Only three transitive roots account: *juk*, *uk'* and *laj*. The first two have been excluded, as they appear to be fossilised and lexicalised forms because of their untypical phonemics (the allomorph *–ub* and *uk'* instead of *uch'*). The case of *laj* is not entirely beyond doubt (footnote 900)

[902] Proposed translation for *bak*: "joint". Because of the derivational pattern, the root is believed to be positional. CHR provides nominal evidence of the semantic domain to which the positional is attributed, cf. *bahk*, "joint (in the body or in a plant)", *bahk uyok*, "leg joint", *k'ux bahker*, "arthritis"; and related derivations such as the versive *bahkoih*, "be jointed, having joints" and the participle *bahkoibir*, "jointed" (Wisdom 1950: 577).

[903] Some possible intransitive positional spellings with *–laj* occur in C Ma. 59b, if the sign 1BB is indeed the same as 1B9 **CHAK**, as proposed by Ringle and Smith-Stark (Ringle and Smith-Stark 1996: 295). The accompanying vignettes show different deities above persons tied to scaffolds. See footnote 434 for a discussion about the sample in Figure 152c.

[904] The underlying positional root is *ek ~ [h]ek*, "place, insert". Wichmann (2002a: 10) proposed *[h]ek-l-ib* to translate as "panel". The example illustrated is subject to *ux(u)l-aj*, "it became carved", strengthening the assumption.

[905] We have evidence for a transitive verb from CHL with *jam*, "abrir (casa, libro, caja)" (Aulie and de Aulie 1978: 40) and CHN with *häm* (also as a positional), "to open" (Knowles 1984-88), while CHR has *jam* as the noun "space" (Hull 2005: 50), in compounds to denote specific openings, e.g. *jam ch'en*, "ravine". Considering the blur between positionals and transitive verbs, we may have (as with *chak*, "to tie") an instance, where the verb is used as a positional, explaining *jam-l-ib* as "opening".

[906] Proposed translation for *pet*: "to pour". Sebastián Matteo (written communication, December 30, 2011) pointed this example from a vessel in a private Belgian collection out to me. The root must not be confused with *pet*, "round", Matteo relates to the transitive verb *pet*, cf. CHR *pete*, "pour out, pour a liquid, allow a liquid to run, empty a container", *pehtib*, "any pouring vessel" (Wisdom 1950: 563-564) and CHL *pejtel*, "sacar (la olla del fuego)" (Aulie and de Aulie 1978: 71). While CHR passivises, the ClM example operatives with an intermediate antipassive to arrive at *pet-n-[i]b*, "pouring vessel." While the example is technically an underspelling by the use of the **ne** sign, it could also be viewed as a misspelling, considering the standard **PET-ne** < *pet[e]n*, "lagoon, island" (e.g. Figure 107b) the scribe may have had in mind.

[907] While the transitive root *uk'* normally shows no orthographic trace of intransitivation (see footnote 404), two examples deviate from the abundant *y-uk'-ib* instrumentals for "drinking vessel." The spelling **yu=k'i=li=bi** can be analysed as *y-uk'-l-ib*, derived as the root were positional, possibly explainable with a blur of lexical classes. The second instance (Figure 152h) probably contains a head variant for **yi**, thus the analysis may result in *y-uk'-*

ku=li=bi (COL St. New York, F1b)[908], **j)** JGU^{yi}**=ni=bi** (TPX MV 55, P1-Q1)[909], **k)** JGU**=li=bi** (COL K8088, K1-L1), **l)** JAGUAR.EYE^{CV}**=ni=bi** (NAR St. 13, F16), **m)** JAGUAR.EYE**=li=bi** (COL MFA 1988.1284, M1).

All forms with their instrumental in final position discussed so far are basically of a canonical bisyllabic shape, either as CV.CVC, e.g. *way-ab* as *[wa.jab'], *y-uk'-ib* as *[ju.k'ib'], or *ok-ib* as *[ʔo.kib'], as well as CVC.CVC, e.g. *pet-n-[i]b* as *[pet.nib']. A regular CVC root inflected with 3SG.ERG / __C results in a trisyllabic word, e.g. *u-way-[i]b* as *[ʔu.wa.jib']. Passivations regularly would result in a CVh.CVC syllable with a first open heavy syllable containing the infix. But I assume the same [h] > [ʔ] / __[±STOP,+FRICATIVE,+GLIDE] rule for the infix (Chapter 4.1.1) resulting in a CVʔ.CVC form, e.g. with the example in Figure 150c as *la<'>j-ab* for *[laʔ.xab'] instead of ***la<h>j-ab* for *[lah.xab'].

The phonemics of these basic forms leads to the question of the morphophonemics of the *–Vb* suffix in =**bV** / ... spellings. For the suffixes *–aj*, *–V₁w* ~ *–Vw*, and *–V₁y* ~ *–Vy* discussed among the showcases and other morphemes in non-final position, vowel syncopation has been reconstructed mainly by phonemic premises and orthographic indications, sometimes supported by grammatical evidence from modern Ch'olan languages.

While in the mentioned cases of vowel syncope, the / __# standard spelling pattern is altered to enable an integrative spelling of the suffix in second position (e.g. passive thematic =**ja** / __# > =**jV** / ...), the orthography of the instrumental is less decisive. In all cases except the one in Figure 153d, where =**ba** / ... indeed signals a C.C morphemic boundary, =**bi** / ... is applied, as it is then followed by an *–il* possessive suffix (Houston, Robertson and Stuart 2001b: 9-10, 24).

The same morphophonemic premises with a *–VC* suffix following may apply in order to syncopate the instrumental suffix vowel for a *[CVC.b'VC] form. The exceptional case of **ya**=**na**=**ba**=**tz-li** in Figure 153d can indeed only be analysed as *y-a[h]n-ab-tzil* for *[jah.nab'.t͡sil], as a vowel syncope

y-ib, an intermediate mediopassive. The latter is proof that *uk'* was indeed a transitive root in ClM.

[908] A secure identification of the superfix is not possible. The *–l-ib* instrumental demands a positional root (less likely a transitive verb) of the shape *CVk*, possibly even *Cuk* (thus expecting a **Cu** syllabogram). No conclusive lexical evidence is found for such root.

[909] No translation can be provided, as the sign ST7 remains undeciphered. Stuart (2012a: 4) considers the representation of the head of the 'Jaguar God of the Underworld", together with the **yi** complementation (here and on REI HS. 1 A, pA1b), he considers a morphograph **BOLAY**. Morphologically, there is problem, as *bolay* is not a verbal or positional root to explain the derivational patterns in Figures 152j-m. Also no substitutions with grapheme AT6 are known (see footnote 765). The variants ST7(1) and ST7(2), dubbed here as **JGU** and **JAGUAR.EYE**, substitute in calendrical contexts: (1) in the 'jaguar form' of Glyph C (Linden 1996: tab. 3, Thompson 1950: figs. 36-37), and (2) as the patron for the month *Wo* in the ISIG on PMT Mon. 5 (Thompson 1962: 282). Otherwise, ST7(2) appears in the codices as the name for God M (Taube 1992: 88), suggesting different morphographic readings outside calendrical information. With the examples and substitutions compiled by Boot (2009a: fig. 5), the **yi** in Figure 152j can be taken as a phonemic complement of a *CVy* morphograph (or even *Ciy*, if synharmony applies at C.C morphemic boundary). The two examples from Naranjo (Figure 152l) have a subfix that very much appears as **wa**, thus rather suggesting a *CVw* or *Caw* root. Although the context of a nominal phrase may suggest a plain substitution as apparent in Glyph C, the differing patterns of complementation indeed point to two different readings of the variants classified under ST7. While the examples involving ST7 could be interpreted as nominal compounds (see footnote 431), there is another solution that builds on the =**ni**=**bi** ~ =**li**=**bi** suffixation. The root(s) is (are) likely to be a transitive verb, as =**ni**=**bi** follows in most cases, while the alternant with =**li**=**bi** is the result of the blur with positional roots. All examples occur in nominal phrases among individuals' titles.

would result in an impossible three-consonant cluster. WCh languages do not seem to favour syncopation in these environments[910], while CHR does not require a possessive suffix[911]. But an exclusive WCh phonological explanation would oppose the view that most ClM features are preserved in ECh. Although no syncopation is attested with the *–aj* inchoative (Chapter 4.1.3), it only appears with two morphemes to follow (the ~ *=ij=iy* enclitic alternant). But more importantly, if synharmonic root spellings are indicative of a C.C morphemic border (compare to Figure 154), the abundant cases of **yu=k'i=bi=lV** (Figure 153f-g) should indeed be analysed as *y-uk'-ib-il* for *[ju.k'i.b'il], which is a clear tripartite canonical form. I therefore deem no general syncopation with the instrumental when a simple *–VC* suffix follows, with forms resulting in a *[CV(h).CV.b'VC] or *[ʔu.CV(h).CV.b'VC] form.

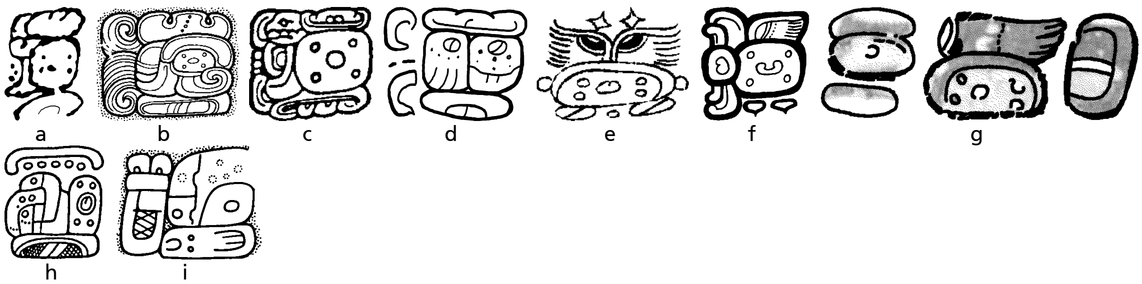


Figure 153: Examples of instrumentals with a potential non-syncopated suffix in non-final position. **a) a-na=bi=li** (COL K8123, B2), **b) ya=na=bi=li** (COL P. Houston, D5), **c) ya=a-na=bi=li** (COL St. Antwerp, F5), **d) ya=na=ba=tzi-li** (YAX St. 31, A2), **e) u-k'i=bi=la** (RAZ K8042, E1), **f) yu=k'i=bi=la** (BPT Bur. 2, Msc. 2, C1), **g) yu=k'i=bi=li** (COL K4143, F1), **h) u=WAY=bi=li** (PNG P. 12, M1), **i) tu=WAY=bi=li** (TNA Frg. 91, pD2).

This leads to some further considerations regarding the phonology and stress patterns. As section 3d in Chapter 3.2.2 outlined, stress is regularly put on the last syllable Ch'olan languages. With no syncopation, the suffix vowel may therefore undergo an allophonic variation in an unstressed second to last syllable and implying secondary stress on the syllable before, e.g. *u-way-ib-il* as *[ʔu.ˌwa.jɪ.ˈbil] or *y-a[h]n-ab-il* as *[ˌjah.nə.ˈb'il]. Possibly, as argued for the mediopassive (Chapter 4.1.12), the non-syncopated suffix vowel is dissimilated to a mere echo vowel to rather maintain a bi- or tripartite syllabification such as *[ʔu.ˌwaj$^{\text{ɪ}}$.ˈb'il] or *[ˌjahn$^{\text{ə}}$.ˈb'il]. The reason not to syncopate might also be induced by the suffix consonant (here: a stop), in contrast to other environments of syncope (as with the passive, there: a fricative).

The above mentioned facultative suffixation with a *–Vl* possessive suffix is not only a deductive issue based on the orthographic phenomenon of underspellings (see Chapter 3.2.2, section 3a for fur-

[910] These cases are irrespective of the current function of the *–Vl* suffix. Compare to *ajnibal*, "lugar" or *chʌmibʌl*, "veneno" (Aulie and de Aulie 1978: 9, 24), and more specifically to *wʌyibʌl*, "cama" (Aulie and de Aulie 1978: 107) and *wäyiba*, "lugar donde se duerme" (Keller and Luciano 1997: 279). While the function of the *–ä(l)* suffix is locative here and different to the ClM possessive, the same morphophonemics may apply.

[911] At least the textual data suggest a facultative use, compare to the use of *jajxib'*, "spinning wheel" in the following sentence: *[e] winik umani ujajxib' usukchij twa' uche e sukchij*, "[t]he man bought a machine to spin fiber" (Hull 2005: 49). The **u=WAY=bi** spelling in Figure 148c could be such a case, when compared with Figures 153h-i, also considering its Copan provenance that might indicate a CHR vernacular.

ther considerations)[912], it may also not only be dependent of the language, but also the syntactic environment. As *–Vl* possessive suffixes are not part of the showcases, these patterns cannot be investigated any further within the scope of this study[913]. In any case, this question is highly significant for how often underspellings indeed occur[914].

Those cases with an ~ *–il* possessive suffix and an alleged syncopation (Figure 154) only regularly appears with *ok*, turned into a synharmonic spelling (compare Figure 154a with 145a). Its case is phonologically rather opaque (see footnote 892) and restricted to Palenque, but synharmony cannot be taken as evidence for a full phonemic spelling ***y-ok-ob-il*, as **–ob* is not a typical Ch'olan allomorph and *–ib* is used otherwise; but at the same time, syncopation is apparently uncommon in WCh (with vernacular influences attested in the texts commissioned by *Ahkul Mo' Nahb* III). An analysis as either *y-ok-[i]b-il* or *y-ok-b-il* is credible by syllabification, but the explicit spelling change from **o-ki=bi** to **yo=ko=bi=li** is indeed strong support for a morphophonemic process, as first suggested by Mora-

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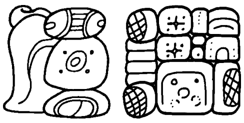
912 This is for example visible with body parts of a subjugated individual being treated by the victor. While *–il* (with *jol*) and *–el* (with *bak*) are mostly spelled out, *–il* may frequently be omitted, compare **u=JOL-lo=li** on COL Shl. Taylor Limpet, I1b with **u=JOL-lo** on COL St. Nil Sajal, A17, but also *–el*, as visible in the *bak-el way-w-al* expression in Palenque (while omissions are not uncommon within name phrases, compare Figures 86a and 88a).

913 The sampling of instrumental forms nevertheless noted some prevalent patterns, especially among the **yu=k'i=bi=lV** spellings. These only appear when the word functions as the stative predicate of a sentence, but not necessarily, as the majority of predicative drinking vessel statements is just written as **yu=k'i=bi**. The same is true for the *a[h]n-ab* title. It is spelled **a-na=bi** when unpossessed and part of a nominal phrase (Figure 146a), it is spelled **ya=na=bi=lV** when possessed and being the predicate of a statement relating to another person (Figure 153b-c). The *–Vl* suffixation in predicative position is also strengthened by a few cases with *–il* which are unpossessed. The *a[h]n-ab-il* spelling in Figure 153a for example is part of a nominal phrase labelling a person in the scenery – thus part of a stative predicate. The case of *uk'-ib-il* (Figure 153e) is a stative predicate with a prepositional phrase to follow (thus "it (is) the drinking vessel for …"). The contrary (i.e. the absence in predicative position) is also attested with other lexemes, such as the **ya=na=bi** spelling (Figure 146b) which is followed by **AJ=3=BAK** that likely is part of the possessor's titles.

914 Despite a more thorough review, it is worth considering that the possessive suffix may regularly appear when the possessed is in predicative position of a sentence, leaving two implications: (1) it is optional in spoken language and thus reflected in writing, or (2) it is mandatory in spoken language and frequent underspellings occur in writing. With 145 predicative spellings of **(y)u=k'i=bi** (35.2% of all 412 instrumental derivations of *uk'*) against 12 spellings of **(y)u=k'i=bi=lV** (2.9%) in predicative position (and with 374 **(y)u=k'i=bi** spellings altogether making up 90.8% among the instrumental derivations of *uk'*, leaving aside some 'irregular' spellings; note that among these, the morphographic spelling **yu=UK'(=bV)** comprises 3.6% and appears only twice with **=bV** / __# on K635 and K1226) rather points to option 1, even when considering the highly formulaic and thus abbreviatory nature of the PSS. How do these figures compare to secure cases of underspellings? Contrast these figures to the majority of 209 full **T'AB=yi** spellings (79.8% of all 262 mediopassive forms of *t'ab*) versus 47 underspellings with **T'AB(-ba)** ~ **t'a-ba** (17.9%), which in any case must write *t'ab-[a]y-i-Ø*. The same is true for other suffixes: 970 samples or 93.5% do not underspell the *–aj* thematic, 310 samples or 92.8% provide a full spelling for the *–aj* inchoative suffix. These figures are all significantly higher than among *uk'*, supporting the argument that *–Vl* is not regularly underspelled, but subject to linguistic conditions. However, questions arise with other lexemes or *–Vl* suffixes. With **u=tz'i-bi=na=ja=la**, we have a case for a *–Vl* suffix that appears with 43 spellings or 53.6% of possessed forms, while the remainder is the underspelled **u=tz'i-bi=na=ja** variety. While an attributive quality of *tzih* is assumed, a full **tzi-hi=lV** spelling appears in 14.3% of all cases, and **yu=ta=lV** (of the possessed root *(h)ut* not considered, see footnote 743) is, as far as recognised during the sampling for the data base, only spelled in a minority of cases, in contrast to the far more abundant **yu=ta**. These considerations are based on a few examples only, and, as far as possessive *–Vl* suffixes are concerned, they have not fully been reviewed against the linguistic data. However, the empirical figures already provide some direction that the conditions for nouns to take a possessive *–Vl* suffix are more complex – both for morphology and semantics – than previously outlined by Houston, Robertson and Stuart (2001b).

Marín (2003a: 27, 29) by these examples, hence I support *y-ok-b-il* for *[jok.bil]. The example of *way* (Figure 154b) is ambiguous, as **wa-ya** is the standard synharmonic pattern (see Figures 146d-f)[915].



a b

Figure 154: Examples of instrumentals with a potential syncopated suffix in non-final position. **a) yo=ko=bi=li** (PAL T21B-E, 25), **b) u=wa-ya=bi=li** (IKL Lnt. 1, C1).

Five examples of the intransitive root *aj*, "to wake up" spelled as **ya**=**ja**(-**la**)=**ji**=**bi** (Figure 155) have been identified by Boot (2004a) which may represent a possible –*(a)jib* suffix that is reflected in ECh as –*Vib* (Table 51). For CHT, instrumentals on <*Vib*> are attested, some with (derived) transitives, but also intransitives (cf. Sattler 2004: 384). And although WCh has an instrumental –*Vj-ib*, it does not apply, as it only comes along with (derived) transitives, where –*Vj* serves as the intransitivising suffix. The additional vowel is optional (Boot 2004a: 7) and can only be a non-elided root thematic vowel typical for ECh, as discussed in footnotes 83 and 402. In order to prevent a vowel hiatus, a glide is inserted. By the spelling patterns, we can assume that it was [x] in ClM and was weakened to [h] by CHT times, as Morán omits it among his examples. The spellings are a good support to propose an ECh vernacular spelling from the verbal stem *aj-a*.

By style, I would attribute all complete plates to the Peten area, testified for TIK MT. 216b and the unprovenanced vessel (Boot 2005c) to originate from a north-eastern Peten workshop (Krempel and Matteo 2012: 148-150, fig. 4d), while the sherd from Piedras Negras is only located on the very western fringes of the ECh border (Figure 2). This examples could be of original location, but also an imported piece.

Boot (2005c: 2) considers for the spelling in Figure 155b a gerund form to explain the **la** sign. As a verbal noun, it cannot immediately derive an instrumental, thus a detransitiviser is again needed, in which case the **Ca**=**ji**=**bi** sequence imposes an inchoative –*aj*. I doubt that by semantic considerations, as this intransitivation is of an anticausative type, but with a verb that is lexically already anticausative (cf. Haspelmath 1987: 3-4), see footnote 290, thus we might deal with a special verb form. In both cases, the –*Vj* part before the proper –*ib* instrumental might also just be inserted for a non-CVC form *aj* ~ *ajal*.

a b

Figure 155: Examples of instrumentals reflecting possible vernacular influences. **a) ya=ja=ji=bi** (COL Pomona 10.422277, D1-E1), **b) ya=ja=la=ji=bi** (TIK MT. 216b, A1-B1).

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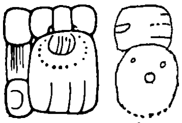
915 We would semantically expect ~ –*ib* in this case (compare to Figure 153h-i). An explanation other than syncope could be the marking of a Yukatekan vernacular –V_1b suffix and thus a pronunciation as *way-ab-il*.

Insecure cases classified as spelling group 4 are only attested with one lexeme and three potential examples[916]. Other spellings that include a final **bi** sign and have previously been interpreted as instrumentals (see footnote 431) have not been taken into consideration as problematic cases, but are excluded, as their lexical class does not support the underlying proposed morphology.



a b

Figure 156: Examples of instrumentals with unclear reading or segmentation. **a) u=ma=ba** (LAC P. 1, C6), **b) ma=bi** (CPN Alt. G, C1b).

The significant amount of syllabic or complemented spellings is significant, although only boosted by the amount of *(y-)uk'-ib* examples from PSS contexts. With all likelihood, this leaves all such spellings as truly integrative, providing a distinction between the three *–ib* ~ *–ab* ~ *–ub* allomorphs attested. The question remains if there is really a distinction between *–ab* as a an agentive / animated instrumental and *–ib* as a standard / inanimate instrumental, as Beliaev (2004) suggested by outlining the orthographic contrast between *way-ib* and *way-ab* (leaving apart the probable vernacular case in Figure 154b).

However, this pattern is not stringently exercised and only verifiable with *a[h]n-ab* and *way-ab*. At least for *way*, we can suspect that a functional differentiation to *way-ib* is indicated by an alloform *way-ab*, as Beliaev (2004: 136) demonstrated by respective spellings (see Figure 146a, d). However, as no example of an instrumental of *way* is known where *–ib* is indicated by a full phonemic spelling, a

[916] No decisive translation can be offered, as the underlying morphology remains dubious and it is uncertain that it is indeed an instrumental. Boot (2009b: 125) has analysed the **ma-bV** spellings as *mab*, "cache", however, there is no firm lexical evidence. If the interpretation is accepted, and an underspelled root is taken into consideration, then the following lexical entries may account: CHR *mahan*, "loan" (Wisdom 1950: 521), CHL *majan*, "prestado" (Aulie and de Aulie 1978: 55), and CHN *majnan*, "prestar" and *majan*, "prestado", and possibly *maje'*, "mojar, sumergir" (Keller and Luciano 1997: 155). Although problems remain with the transitive nature of the verb and no apparent intransitivation is evident, I would analyse the instrumental as *ma[h]n-ib* from an underlying **ma[h]an-ib*, where the second stem vowel is syncopated (see footnote 663). The recorded cases are then underspellings, as a nasal (when *ma[h]nib* is viewed as a lexicalised instrumental) can frequently be underspelled (cf. Zender 1999: 137-139), although this hardly appears at a syllable coda here (with *[mah.nib']), thus a syllable onset may in addition to Zender's example also be affected (see footnote 735). If the above assumptions are valid, then the proposed etymology for "cache, offering" has interesting implications to the *k'ex* concept, a word that roughly can be circumscribed as "change, substitute, exchange", but with deeper ritual implications, as e.g. in YUK "la acción o efecto del cambio", "trueque, recompense, o recompensación" and "rito del cambio" (Barrera Vásquez 1993: 396). In Yucatan, it is e.g. part of curing ceremonies (cf. Love 1989b: 337-338), as also this excerpt from an incantation to cure scorpion stings in the *Ritual de los Bacabes* (Arzápolo Marín 1987: 385-386 [own transcription]) demonstrates: <*u suhuy puɔ bin a chich a cħah oc tauach u suhuy kak bin a chich labin oc tkinam tauach tilah han unek sisbic tauach pic chin tech tan kula*> – "La sagrada aguja de tu abuela fue la que cogiste y se te introdujo en el miembro. Y fue el fuego sagrado de tu abuela. Todo esto se te introdujo en la dolencia, en tu miembro. Ahí se encogió la punta y se te enfrió el miembro. Lánzalo tu mismo frente a este dios." The same concept also appears in the *Poopol Wuuj* (f. 16v), when red resin is offered instead of the heart of *Xquic* to the underworld lords (cf. Schultze-Jena 1944: 50): <*εaε cut vvaal ri che xelic xcul pazel catepuch xuvon rib coloquic xuxic vquexel ugux ta iitz chi cul v vaal. cac che*> – "Then the red secretions of the tree were collected in the bowl. There it congealed and became round. The red tree, therefore, oozed forth the substitute for her heart." (Christenson 2003: l. 2452). Also see Taube (1994: 671-674) for an interpretation of the 'sacrificial bowl' theme in Classic Maya iconography as a *k'ex* offering to the underworld to allow royal succession.

faint possibility in contrast to lexical evidence exists that *–ab* was always applied. When turning to other lexemes, the inferred semantic distinction between alloforms becomes less accentuated. The *y-ut-ib* on PAL TI-W referring to *Balun Tz'akbu Ajaw* does not indicate the suspected *–ab*, see footnote 895 (unless in the emic perspective it was not considered as a being). A deviation is also noted among chik-ab and laj-ab, unless music instruments were perceived as animated producers of sound. A comparison with modern Maya conceptions might further elucidate this question.

Apart from the functional aspect, the attested spellings and their implications also do not yield a profound proposition to determine preferences of an allomorph depending on the root vowel. However, *–ab* seems to be preferred with CaC roots, but that may simply be a distortion by the limited lexical range. Based on the verbal class, the following canonical instrumental derivations (Table 86) can be summarised, considering the major allomorphs.

Type	Transcribed Paradigm	Canonical Spelling
-INSTR	*u-CV$_1$C-ib*	**u=CV$_1$-Ci=bi / u=CV$_1$'=i-bi**
(non-)CVC	*V$_1$C-ib*	**V$_1$-Ci=bi**
VER.INTR	*y-V$_1$C-ib*	**yV$_1$=Ci=bi**
VER.TR (fossilised)	*CV$_1$C-ab*	**CV$_1$-Ca=bi / CV$_1$C-Ca=bi**
	V$_1$(h)C-ab	**V$_1$-Ca=bi**
	y-V$_1$(h)C-ab	**yV$_1$=Ca=bi**
	CV$_1$C-Vb	**CV$_1$-CV$_1$=bi**
	CV$_1$C-[i]b	**CV$_1$C=bi**
	y-V$_1$C-[i]b	**yV$_1$=V$_1$C=bi**
	CV$_1$C-[a]b	**CV$_1$C=bi**
	y-V$_1$C-i[b]	**yV$_1$=Ci**
	CV$_1$C[-Vb]	**CV$_1$C**
	y-V$_1$C[-Vb]	**yV$_1$=V$_1$C**
-INSTR (vernacular)	*y-V$_1$C-V$_1$jib*	**yV$_1$-CV$_1$=ji=bi**
(non-)CVC		
VER.INTR		
-INSTR-…	*u-CV$_1$C-[i]b-il*	**u=CV$_1$C=bi=li**
(non-)CVC	*V$_1$(h)C-V$_S$b-il*	**V$_1$-CV=bi=li**
VER.INTR	*y-V$_1$(h)C-Vb-il ~ y-V$_1$(h)C-Vb-tzil*	**yV$_1$=CV=bi=li ~ yV$_1$=CV=bi=tzi-li**
	u-CV$_1$C-b-il	**u=CV$_1$-CV$_1$=bi=li**
	y-V$_1$C-b-il	**yV$_1$=CV$_1$=bi=li**
-INSTR	*CV$_1$C-C$_d$-ib*	**CV$_1$-CV$_1$=C$_d$=bi / CV$_1$C=C$_d$=bi**
(non-)CVC	*V$_1$C-C$_d$-ib*	**V$_1$-CV$_1$=C$_d$=bi**
VER.TR.R	*y-V$_1$C-C$_d$-ib*	**yV$_1$-CV$_1$=C$_d$=bi**
-INSTR	*CV$_1$C-l-ib*	**CV$_1$-CV$_1$=li=bi / CV$_1$C=li=bi**
(non-)CVC	*V$_1$C-l-ib*	**CV$_1$-CV$_1$=li=bi**
POS		

Table 86: Morphological paradigms and canonical spellings of instrumentals (C$_d$ = consonant of the intransitivising morpheme).

4.1.18 – Nominaliser Suffix *–Vl*

The main scope of this chapter is to review the linguistic premises (Chapter 3.1.6) for intransitive and transitive verbs against the epigraphic evidence, which was largely excluded from the statistical analysis of the spelling patterns (Chapter 3.3.3.6). Furthermore, the determined standard spelling pattern (Table 73) and the more granular statistically determined spelling schemes are reviewed with regard to the verbal valency.

Root intransitive verbs comprise slightly more than one third of the showcase samples, of which six feature integrative spellings (Figure 157). All change their completive root spelling (e.g. compare Figure 134a with 157b), mostly suffixed by =**la** / __# as the orthographic marker: **(C)V-Ci** / **(C)VC-Ci** > **(C)V-Ce=la** / **(C)VC-Ce=la** for a *(C)V(h)C-el* form. The only exception is Figure 157c-d, where the root spelling switches to a **(C)V-Ca=lV** pattern, indicating a *(C)VC-al* alloform, so far only attested with *e[h]m*. These cases may cover a broad variety of spelling schemes, although only 1.b.i, 1.b.ii and 1.d.ii are covered.

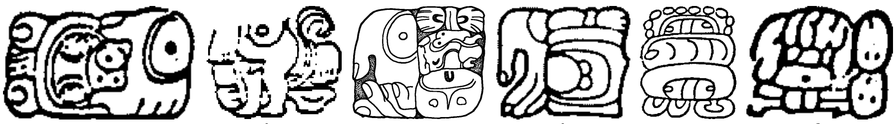


Figure 157: Examples of nominalisations of intransitive verbs with integrative root spellings. **a) u=?-ye=la** (CPN St. E, C7)[917], **b) ᵃAN-ne=la** (RSB HS. 3 III, 12), **c) ye=ma=la** (PAL T18S, F8)[918], **d) ye=ma=lo** (QRG St. D, A20a), **e) HUL-le=li=ji=ya** (CPN Alt. F', A3b), **f) yo=che=la** (TIK MT. 176, T2).

Intransitive nominalisations involving a single morphographic root spellings (Figure 158) are limited in quantity and lexical diversity. Unfortunately, none of these examples has a spelling group 1 counterpart to cross-check the suffix vocalisation. However, the use of =**le** / __# (Figure 158a-b) implies the suffix vowel, thus a scheme 3.a.i **CVC=le** spelling implies a *CVC-[e]l* form, as also noted for the *–el* possessive suffix (Chapter 4.1.6). The same principle would be true for the potential vernacular cases in Figure 158c-d as *k'ay-[i]l* and *och-[o]l-[a]l* (the latter being a rare case of double vowel-indication). The spelling in Figure 158e replicates the preferred suffixation pattern of syllabic spellings, but remains opaque in any case.

[917] The identification and reading of the main sign is problematic. It resembles 1G5(1) **HUL**, but misses the dotted outline and features a crosshatched interior. As the **ye** sign in the block cannot be explained by **HUL** as a root spelling or grammatical morpheme, I suggest an undeterminable **CV** syllabogram or a **CVy** morphograph of an intransitive verb for the sign in question. An intermediate mediopassive of a transitive CVC verb is also possible. Péter Bíró (personal communication, January 18, 2013) suggested that the block in question could be part of phonemic reading of G2 of the Supplementary Series, but this proposal is not backed by the context. A nominalised verb is also indicated by the following expression *xot'-ol* (Figure 160g) within a compound.

[918] The two examples of a nominalised *e[h]m*, if taken as integrative spellings, deviate from the intransitive *–el* paradigm by indicating an *–al* suffix. As the Ch'olan data indicate (Table 56), *–al* is possible in ECh languages, but preferably as the result of in intermediate passivation, where the thematic assimilates with the nominaliser. Such process is not necessarily realised in ClM (see Figure 159b, d-g). Other derivational processes, such as abstraction, can at least be excluded by the context of Figure 157d which is directly followed by a deity name.


a b c d e

Figure 158: Examples of nominalisations of intransitive verbs with morphographic root spellings. **a) u=HERON.FISH=le** (PAL T19S, D1b)[919], **b) ta HERON.FISH=le** (PAL T21B-E, 31), **c) K'AY=li** (EKB M. R22, F1)[920], **d) OCH=lo=la** (C Pa. 3b, D2), **e) wa WE'=la** (PAL K'TOK, pD10b)[921].

Such nominalised intransitive verbs primarily follow a canonical bisyllabic *[CV.Cel] segmentation, involving those with an open heavy first syllable, e.g. **ᵃAN-ne=la** < *a[h]n-el* as *[ʔah.nel]. Possession may result in a trisyllabic *[ʔu.CV.Cel] form (attested with the unreadable cases in Figure 157a and 158), otherwise the bipartite syllabification is retained, e.g. **yo-che=la** < *y-och-el* as *[jo.t͡ʃel]. Alternative spellings, e.g. **ye=ma=la** < *y-e[h]m-al* may be indicative of a ClM six-vowel system for *[jeh.məl][922].

That the ~ *–el* nominaliser is restricted to intransitive verbs, as suggested by the Ch'olan language data (Table 56), is further attested for ClM by several detransitivised verbs (Figure 159). Most apparent is this process by a suffixed intransitiviser, such as the mediopassive (Figure 159a, h) or the supposed antipassive (Figure 159i-j, see footnote 434). Such cases feature a scheme 1.f.ii **CV_1-CV_1=Ce=lV** or **CVC=Ce=lV** spelling for a *CVC-y-el* or *CVC-j-el* form, where no real preference between =**le** / __# or =**la** / __# as the indicating syllabogram can be determined. Vowel syncope is supposed following the base line of argumentation for other =**yV** / … and =**jV** / … spellings, ensuring a canonical *[CVC.jel] or *[CVC.xel] syllabification. It can occasionally be enlarged into a trisyllabic form upon possession, e.g. **u=ti-mi=je=la** < *u-tim-j-el* as *[ʔu.tim.xel].

More difficult are those transitive roots with a **CV-Ce=lV / CVC-Ce=lV** spelling, but without any overt intransitiviser (Figure 159b-g). Rather than implying direct nominalisation with *–el* from transitive roots, a passivation is the more appropriate analysis, as the <*h*> infix is not indicated by any

919 No reasonable reading can be given for the sign BM9 **HERON.FISH**, as it exclusively occurs in Palenque without any known syllabic substitution. The context of BM9 was extensively discussed by Stuart (2000: 14-15, 2005b: 37-38) and I follow his suggestion that it writes an intransitive verb (as indicated by =**le** < *–[e]l*), which is nominalised by here, as in three instances it is preceded by *u-NUM-tal*, together reading "for the 1st/2nd/3rd time it (was) his X-ing." Of course, the possibility of a passivised transitive root cannot entirely be neglected. The example shown in Figure 158b follows **WA'=wa-ni** < *wa'-wan-Ø*, "it was erected", suggesting that the *HERON.FISH-[e]l* noun in a prepositional phrase either refers to an object or a locality. The ethnotaxonomic bandwidth for herons (or specifically the Great Blue Heron [*Ardea herodias*], as Stuart suggested; other bird species have otherwise been proposed) is not necessarily suggestive for the decipherment of the **HERON.FISH** sign.

920 There is some reason to consider this example as a Yukatekan vernacular. An ~ *–il* allomorph (Table 57) might be indicated by the **li** sign which is otherwise uncommon in these contexts. Also see footnote 928 for other cases with **li**, but these may be functionally different.

921 The four samples of this spelling have been classified as a problematic 4.a.i case. See footnote 91 for a detailed discussion of the transcription options and their implications.

922 Also see footnotes 925 and 942, where functionally equivalency has to be considered as a pronunciation alternative. Other contexts show that is apparently not uncommon between /a/ and /e/ (see footnote 734). Such replacements may possibly indicate a scribal insecurity, if these contexts exhibit not a plain [a] sound, but the [ə] allophone, which possibly was realised by **Ca** graphemes (see footnote 169). In such case, we might suspect that the /e/ allophone used in this and similar contexts and environments was [ɛ], closer to the schwa in the ClM vowel trapezium. Therefore, *[jeh.məl] may be an apter phonetic reconstruction of this spelling, possibly instead of a 'regular' *[jeh.mɛl] and other such cases like *[jo.t͡ʃɛl].

special orthographic convention (see Chapter 4.1.1). Thus, we e.g. can analyse **ko-ke=le** < *ko<h>k-el*, resulting in a bipartite syllabification *[koh.kel]. The same [h] > [ʔ] / __[±STOP,+FRICATIVE,+GLIDE] rule established for the passive and its further derivations (see Chapters 4.1.1 and 4.1.17) also applied here, thus ^{jo}**JOY-ye=la** < *jo<'>y-el* for a *[xoʔ.jel] form, rather than ***jo<h>y-el* for **[xoh.jel].

Only two examples of the nominaliser in non-final position are sampled. The **HUL-le=li=ji=ya** < *hul-el-Ø=ij=iy* in Figure 157e is good evidence that the *–Vl* nominaliser is not syncopated, but this may rather be the result of the ~ *=ij=iy* alloform, see footnote 633. The **OCH=lo=la** in Figure 158d with its implied *och-[o]l-[a]l* transcription is suggestive for no syncopation at best.

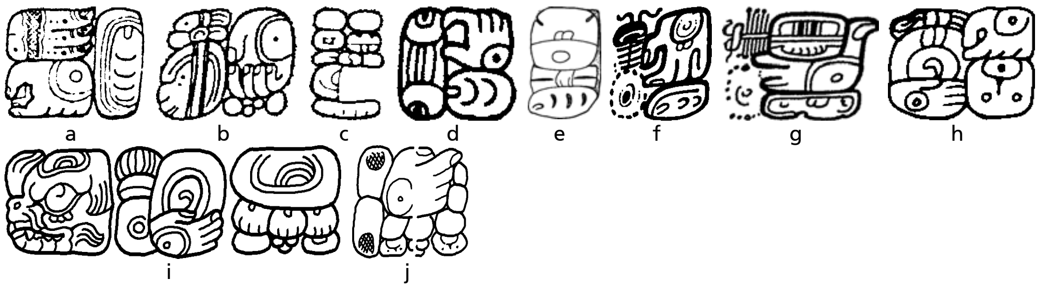


Figure 159: Examples of nominalisations of intransitivised verbs. **a) K'A'=ye=le** (SCU St. 1, A8), **b) ti** ^{jo}**JOY-ye=la** (YAX Lnt. 26, T1), **c) u=AJAW=JOY=ja=le** (NAR St. 32, S3)[923], **d) ko-ke=le** (NMP St. 15, O1), **e) lo-che=le** (PAL T18S, H7b)[924], **f) ta-ye=le** (MTL K2573, K4)[925], **g) ta=AL CHAN**^{na} (DPL Bur. 30 Plate), **h) ti-mi=ye=la** (PAL HCWF, E1)[926], **i) u=ti-mi=je=la** (PAL TI-W, A11-A12), **j) u=TZUTZ=je=la** (PAL TI-W, I2).

Nominalisations of a root transitive verb (Figure 160) are thus far only attested in syllabic or mixed spellings, pure morphographic roots among spelling group 3 are absent. Hereby, the root spelling undergoes a change to enable integration of the *–ol* suffix (except CoC roots), resulting in **CV-Co=lV** spellings of schemes 1.a.i, 1.a.ii, or 1.b.i, compare for example the root spelling change between Figures 160e and 99n. The indicating syllabogram is either suffix vowel harmonic =**lo** / __# (Figure 160e-g) or features the disharmonic =**la** / __# alternant (Figure 160a-b, d) also attested with the intran-

[923] Erosion leaves doubt that ZU1 **ja** is indeed infixed by **JOY**. In this case, it would be unique example where the passive thematic is retained (at least orthographically) among the nominalisations discussed here. The impact on the morphological analysis and morphophonemics is diverse. If the thematic is retained, we can likely expect the same processes as outlined in Chapter 4.1.1, hence **jo<Ø>y-j-[e]l* or more likely **jo<Ø>y-j-al*. The latter case may also be interpreted in terms of the *–al* abstractive/collective. In the unlikely case the **ja** sign is a simple analytical spelling to indicate passivation, the transliteration would yield *jo<'>y-el*. In any case, the nominalised *joy* forms a nominal compound with *ajaw* and the whole expression translates as "it (was) his lord-binding."

[924] Proposed translation for *loch*: "to bend". Compare to CHR *loch*, "bend, flex, bow, fold, arc" (Wisdom 1950: 514); CHN *loch*, "bent" and *loch-o(n)*, "to bend" (Knowles 1984-88); CHL *lochol*, "torcido" (Aulie and de Aulie 1978: 52).

[925] See Figure 50n for a passive form and footnote 591 for the lexical evidence. The attested examples (also in Figure 159g and 161a) are part of the nominal phrase of a Motul de San José lord (cf. Tokovinine and Zender 2012: 41-45). The intermediate intransitivation is achieved by a passive (as no overt intransitiviser is written), the morphophonemic lenition process prompts *ta<'>y-el*. The whole name of *Ta'yel Chan K'inich* may translate as "Consuming/Rubbing Sky *K'inich*." Acts of consumption are known from other name phrases, such as with the antipassive in *Uk'uw Chan K'inich* (see Figure 117d) from Dzibilchaltun. Somewhat problematic is the example from a burial context in Dos Pilas (Figure 159g) that provides ~ *–al* as the suffix because of the morphographic suffix spelling (compare to Figure 92d).

[926] The drawing leaves the impression that the superfix is rather 32K **hi**, but a comparison with the original confirms that the scribe applied a rather compressed 3M2 **ti**.

sitive *–el* suffix. The only exception to this pattern is a probable ~ *–ul* allomorph (Figure 160c). Such nominalised transitives syllabify in a canonical bipartite *[CV.Col] pattern, e.g. *tz'ap-ol* as *[t͡s'a.pol]. They may occasionally enhance into a tripartite syllabification upon possession, e.g. *u-tz'ik-ol* as *[ʔu.t͡s'i.kol].

Another interesting annotation concerns the sometimes problematic differentiation between certain nouns and a corresponding transitive verb that is apparently not a derived transitive, such as *jul* as "spear" and "to spear"; compare the indicative *u-jul-u-Ø* cited by Boot (2009b: 87) with the passive *ju<h>l-aj-Ø* in Figure 55e (thus less likely an inchoative ***jul-aj-Ø*). Other cases are less clear regarding their morphology. While Classic lowland texts rather spell **wo-jo** < *woj*, "glyph" (e.g. PAL 96G, L5b), texts from Yucatan rather apply a suffixed form, e.g. in **u=wo-jo=le** < *u-woj-ol=e[']* (XLM Jmb. 1, A3)[927].

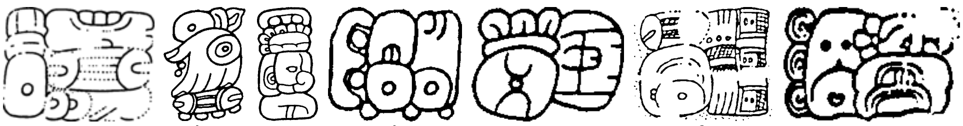


Figure 160: Examples of nominalisations of transitive verbs with integrative root spellings. **a) ti cho-ko=la** (PNG Msc. Peabody, A4), **b) ti CHOK-ko=la** (CRN Msc. 2, A3b), **c) u=ju-bu=li** (QRG Alt. P', M2a)[928], **d) u=lo-k'o=la** (CPN St. 11, Bp5), **e) tz'a-po=lo** (SRX St. 2, D1), **f) u=tz'i-ko=lo** (CPN T. 11 SDEP, B1)[929], **g) xo-t'o=lo** (CPN St. E, D7)[930].

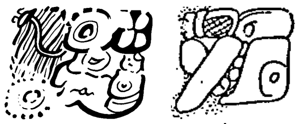
Only two examples of underspellings (Figure 161) are known, one a passivised, the other a mediopassivised transitive. They follow a **CV-Ce=Ø** < *CVC-e[l]* 1.g.i and a **CVC=Ce=Ø** < *CVC-C-e[l]* 1.f.i spelling scheme, still providing the suffix vowel.

[927] Although *woj* appears as well in the Tabasco region, the word is either from a Yukatekan substrate or a purely Yukatekan form, as it is most prominent in inscriptions from the peninsula. In YUK, we find *woh* as a transitive verb "pintar, escribir" as well as a nominalised form *wooh*, "signo, símbolo, guarismo, carácter, letra o signo, jeroglífico" (Barrera Vásquez 1993: 925). With *wòoh*, "to know something", it is also ~ *ʔoh* (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 307), see footnote 459. The suffix is either the ~ *–ol* Ch'olan nominalisation of a YUK transitive verb (compare data in Tables 56 and 57), or represents the YUK *–V₁l* possessive suffix with the substantival stem. In comparison with the Classic pattern that must represent a nominal form, I consider the latter alternative in a Yucatec context, hence such spellings are not among the samples.

[928] If the two examples from QRG Alt. P' represent a verbal noun, the spelling suggests an ~ *–ul* allomorph when considered as an integrative spelling (in comparison with other cases of **ju-bu**, see Figure 127c). The analysis would thus result in *u-jub-ul*. As **li** is only a rarely used syllabogram to indicate a verbal noun (see footnote 920), these cases may alternatively not account at all when analysed as *u-jub-Ø-[i]l*. In this case, 1M4 is considered to indicate the *–Vl* possessive suffix.

[929] No satisfactory translation can be given for *tz'ik*. The only Ch'olan verbal cognate is CHR *tz'ik*, "celebrar" (Pérez Martínez 1996: 231). TZO has *¢'ik*, "turn end up" (Laughlin 1975: 103). Both examples of this spelling are noted with a last *Hotun* statement (cf. Schele 1987d: 2, Schele, Stuart and Grube 1989: 6-7). If the expression refers to the period ending, then *tz'ik-ol* may refer to "celebrating" it.

[930] Proposed translation for *xot'*: "to cut, to split". Compare to transitive roots with CHN *xot'e'*, "cortar, trozar, dividir" (Keller and Luciano 1997: 289); CHL *xot'*, "partir", as well as "terminar culto o fiesta" (Aulie and de Aulie 1978: 117). CHR has a corresponding *xoti* as "chip, flake, hack", but *xot'i* as "prervent, prohibit, stop" (Wisdom 1950: 653). The glottal stop was either lost in CHR or is mis-recorded.



a b

Figure 161: Examples of nominalisations of intransitive and transitive verbs with different under-spellings. **a) ta-ye** (TAM Msc. 4, C1), **b) tu=JEL^{le}=ye** (CPN Alt. U, I3).

A concluding orthographic comment is to be made regarding the vowel complexity[931]. Morphophonemic mechanisms are the only way to result in a *–V'l* suffix, at least attested in CHR (see footnote 447). But no such premises are apparently found in ClM, the thematic of a passivised root transitive is obviously elided (Figure 159b-g), as, with the possible exception of Figure 159b, the orthography leaves no evidence for its pronunciation. Unfortunately, no case of a derived transitive passive is known in such derivation, as e.g. abstraction does not elide the thematic, as the abundant **tz'i-bi=na=ja=la** < *tz'i[h]b-n-aj-al* cases (Figure 61j-k, n) testify. Furthermore, the /j/ prevents any such morphophonemic processes, as no two vowels meet.

A final method to confirm the suggested spellings patterns and thus the *–el* / *–ol* distinction is the context analysis and search for functional differences emerging from the semantic and syntactic embedding. Intransitive or detransitivised verbs with *–el* may appear (1) as a stative predicate with or without an explicit agent expressed by the ergative pronoun; and (2) rarely in a prepositional phrase following a verbal or stative predicate[932]. Transitive verbs with *–ol* may appear in exactly the same syntactic contexts[933]. But there is apparently an eminent semantic difference between two cases: nominalisations of intransitive verbs describe a resultative action state, while transitive verbs are durative; hence intransitivations must take place to describe the condition of a completed action. That may also explain the difference to –Ø nominalisations (Chapters 4.1.9 and 4.1.14), as they appear less a semantic nominalisation than a non-finite verb form, although both may occupy similar roles in the syntagma.

[931] Lacadena and Wichmann (2005b: 28, tab. 1) propose the nominalisers ***–e'l* and ***–o'l* with a complex vowel as minimal pairs opposite to other *–Vl* or ***–VVl* suffixes. Such assumption, based on their harmony rule 3b (Lacadena and Wichmann 2004: 111), does not fit the statistically warranted alternation pattern with a suffix vowel harmonic =**lV** / __# grapheme, which shows no preference regarding a temporal or spatial distribution that may be explainable by the 'loss of disharmony' suggested by several authors.

[932] The variety for the predicate is most diverse, here, the verbal noun may express derivations that, although not exclusively, relate to English *–ment*, *–Vnce*, *–ing*, or *–al*: (1) *hul-el-Ø=ij=iy y-ich-nal yax pa<h>s-aj chan yop+at* (Figure 157e), "after it (was) the arrival in the presence of *Yax Pahsaj Chan Yopat*"; (2) *u-tim-j-el-Ø a[w]-o[h]l* (Figure 159i), "it (was) the appeasement of your heart"; (3) *u-tzutz-j-el-Ø u-lajcha' pik* (Figure 159j), "it (was) the sowing of the 12th *Bak'tun*"; (4) *y-e[h]m-al-Ø a[j]? winik=[i]y? jun pik k'uh* (Figure 157d), "it (was) the descent of *Aj Winikiy* (?) *Jun Pik K'uh*." In a prepositional phrase, the noun seems to describe a circumstance: *u-bah-Ø ti jo<'>y-el ti xik+bal-e[l]* (Figure 159b), "it (is) his image with at binding with the *Xik-Balel.*" Note that among the detransitivised cases, only those with the intermediate *–(V)j* antipassive appear in a possessive phrase, whether this is semantically conditioned is unknown.

[933] As a stative, the focus of the verb seems to relate more to a modal semantics of the action: *u-lok'-ol-Ø k'inich yax k'uk' mo'* (Figure 160d), "the ousting of *K'inich Yax K'uk' Mo'*." Unfortunately, not too many of such instances are well deciphered or understood. The modal aspect is even more accentuated in prepositional phrases, describing an ongoing background action taking place while the main predicate action happened. In this sense, such nominalisations behave like a true gerund: (1) *u-bah-Ø ti chok-ol* (Figure 160b), "it (is) his image while scattering"; (2) *CV<h>tz'-aj-Ø ti chok-ol* (Figure 160a), "it (was) X-ed while scattering"; (3) *ta kan tz'ap-ol ti tun* (Figure 160e), "… (was) while four (times) erecting with a stone."

The sample size is ideally too limited to confirm other allomorphs for the major forms, however, ~ *–al* is attested for *–el*, and possibly ~ *–ul* for *–ol*, at least in ClM. Based on the evidence, Table 87 summarises the derivational patterns attested, based on the verbal class.

Type	Transcribed Paradigm	Canonical Spelling
-NMLS **(non-)CVC** **VER.INTR**	*(u-)CV$_1$C-el* *V$_1$(h)C-el* *y-V$_1$C-el* *y-V$_1$(h)C-al* *(u-)CV$_1$C-[e]l*	**(u=)CV$_1$-Ce=la** **V$_1$-Ce=la** **yV$_1$-Ce=la** **yV$_1$-Ca=la / yV$_1$-Ca=la** **(u=)CV$_1$C=le / (u=)CV$_1$C=la**
-NMLS **(non-)CVC** **VER.INTR.D**	*CV$_1$<h>C-el ~ CV$_1$<’>C-el* *CV1<’>C-e[l]* *CV1<’>[C]-al* *(u-)CV$_1$C-C$_d$-el*	**CV$_1$-Ce=le / CV$_1$-Ce=la** **CV$_1$-Ce** **CV$_1$=AL** **(u=)CV$_1$-CV$_1$=C$_d$e=la / (u=)CV$_1$C=C$_d$e=le**
-NMLS **(non-)CVC** **VER.TR**	*(u-)CV$_1$C-ol* *u-CV$_1$C-ul*	**(u=)CV$_1$-Co=la / (u=)CV$_1$-Co=lo** **u=CV$_1$-Cu=li**

Table 87: Morphological paradigms and canonical spellings of nominalisers (C$_d$ = consonant of the intransitivising morpheme).

4.1.19 – Temporal Suffix *–V$_1$j ~ –Vj ~ –j*

The last showcase is considered a ‘methodological sand box’ and is therefore not paired with a control case. Rather, the investigation of the perfective aspect suffix is intended to serve as an overarching test group to double-check orthographic principles determined by the other showcases. Also, as outlined in the showcase definition (Chapter 2.1.5), several competing functional proposals have been made for **=ji**(**=ya**) spellings, and, ultimately, for *–Vj* suffixes among root and derived transitive verbs.

The major objective is to review the epigraphic evidence, divided into root and derived transitive verbs, and to confirm the alloforms postulated in Chapter 3.1.7 and examine morphophonemic processes. As the perfective aspect marking reconstructed for ClM is extinct in modern Ch’olan languages and only reflected by fixed vowel suffixes in Tzeltalan, a comparison with other showcases is vital to determine the ClM perfect pronunciation by the orthography. Finally, a careful context analysis and investigation of the narrative paradigm of primary and secondary information (MacLeod 2004: 294) is an apt instance to investigate if the determination of the standard suffixation pattern with **=ji** / __# (Table 73) is able to review the models previously discussed in the literature. The limitation to only sample transitive verbs pre-empts a primary consideration of the perfective model, which subsequently has found compelling support by Wald (2007: 312-433). Thus, only linguistic data were collected upon the hypotheses formulation, in accordance with the choice to term this showcase ‘temporal suffix’.

As the statistical figures in Chapter 3.3.3.7 demonstrate, most samples pertain to scheme 2.f.ii with vowel syncope. However, a sufficient number of spelling group 1 samples, although not significant enough for the test, allows to draw a comprehensive picture. Root transitive verbs are supposed to find their *–V$_1$* plain status suffix (Chapter 4.1.8) mirrored in the perfective aspect. Integrative spellings (Figure 162) thus have to feature a scheme 1.a.ii **CV$_1$-CV$_1$** / **CV$_1$C^{CV_1}** / **V$_1$-CV$_1$** > **u=CV$_1$-CV$_1$=ji** /

u=CV$_1$C-CV$_1$=ji / yV$_1$-CV$_1$=ji retention of a harmonic root spelling in most cases for a *u-CV$_1$C-V$_1$j / y-V$_1$C-V$_1$j* form. Only one example (Figure 162) of a disharmonic **CV$_1$C^{CV_2}** root undergoes a spelling alteration (see footnote 780) as scheme 1.d.ii. That some 'vowel initial' ʔVC roots act as regular CVC roots (Figure 162a) is attested in other cases (Figure 99a-c). In general, the root spelling patterns are identical to those found among root transitives in indicative mood (Figures 99 and 100)[934].

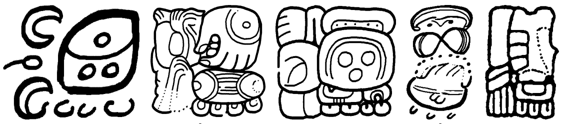

a b c d e

Figure 162: Examples of perfective root transitive verbs with integrative root spellings. **a) ya=la=ji** (COL K7727, S1), **b) u=CHOK-ko=ji** (COL Alt. Puerto Barrios, H3), **c) ma u=na-wa=ji** (PAL TI-E, O10), **d) u=nu-pu=ji** (COL Shl. Taylor Limpet, L1a), **e) u=TZAK-ka=ji** (HLK Lnt. 1, A4).

Root transitives with a simple morphographically spelled root (Figure 163) either classify as scheme 2.e.i (with a CiC root, not attested) or 2.e.ii with **CV$_1$C** > **u=CV$_1$C=ji** for a *u-CV$_1$C-[V$_1$]j* form, where the suffix vowel can easily be reconstructed based on the harmony pattern (compare Figure 163a with 162b).

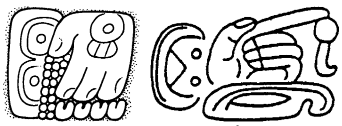

a b

Figure 163: Examples of perfective root transitive verbs with non-integrative root spellings. **a) u=CHOK=ji CH'AJ** (TNA Mon. 104, G1)[935], **b) u=TZUTZ=ji** (RAZ Jd. Celt 2, A3).

Only few examples of root transitive verbs deviate from the standard =**ji** / __# suffixation pattern (Figure 164). All are ʔaC / CaC roots and apply a harmonic =**ja** / __# sign, either as a harmonic 1.a.i spelling **V$_1$-CV$_1$** > **yV$_1$=CV$_1$=ja** or an altered disharmonic 1.d.i scheme **CV$_1$-CV$_2$** > **u=CV$_1$-CV$_1$=ja** spelling for a regular *y-V$_1$C-V$_1$j* / *u-CV$_1$C-V$_1$j* form. The two datable examples shown in Figure 164 originate from *K'atun* interval 9.15 and would temporally coincide with the model of the spread of 'vowel length' distinction (Lacadena and Wichmann 2004: 116), but would still be too westward for this time (cf. Houston, Stuart and Robertson 1998: 284-285). The samples may simply reflect individual deviations related to the root vowel. Also, a careful distinction needs to be made to nominalised passivations (Figure 63h-i) and other spellings that may appear to be perfective when taken out of context (see Figure 62x). The correct morphosyntactic analysis has to rely on the source-immanent examination and narrative embedding.

[934] Especially compare Figures 162a with 99b-c, 162b with 100b-c and 162e with 99m. Also, a comparison with other secure instances of root vowel harmonic suffixes strengthens the *–V$_1$j* vocalisation of the perfect among root transitives. Compare with antipassive spellings (Figures 110-111, 116-117), especially Figure 162b with 111a; and generally put it side by side with mediopassive spellings (Figure 127).

[935] See footnote 315 for the rationale to consider this particular example (despite its Chiapas provenance) to represent a perfect verb form and not a contracted Tzeltalan vernacular form.


a b c

Figure 164: Examples of perfective root transitive verbs with spellings deviating from the standard pattern. **a) ya=la=ja** (PNG Msc. Peabody, A2), **b) u=tza-ka=ja** (YAX Alt. 22, H1)[936], **c) ya-le=je** (PAL HCHS, C2a).

As it has been outlined in connection with the indicative mood of root transitives (Chapter 4.1.8), integrative spellings with the absence of non-integrative syllabic or complemented cases is a clear indication for a full phonemic orthographic strategy to provide the suffix vowel. It abrogates the necessity of a morphosyllable to "supply one that is appropriate", as Houston, Robertson and Stuart (2001b: 15) defined one of their features. Although ****IJ** has been postulated (Robertson, Houston and Stuart 2004: 284), it simply supports the authors' alternative view of the discussed forms as nominalised antipassives. At the same time, the almost constant =**ji** / __# suffixation is a good argument against the extension of the disharmonic model to the suffix domain, as outlined for the passive (Chapter 4.1.1), the indicative (Chapter 4.1.8), or the mediopassive (Chapter 4.1.2)[937].

Root transitive verbs with the *–V$_1$j* suffix in word-final position can regularly be separated into canonical bisyllabic *[jV.CVx] or trisyllabic *[ʔu.CV.CVx] forms, depending on the root shape. Hence, we can broadly phonetically reconstruct *y-al-aj-Ø* as *[ja.lax] or *u-chok-oj-Ø* as *[ʔu. ʧo.kox].

For passivations, the argument has been made that no suffix vowel syncope appears with ʔVC roots and stems (see Figure 61a-d), when the suffix appears in non-final position, as best supported by scheme 1.e.ii =**a**=**ji**=**ya** < *–aj=iy* suffixation patterns. The same process can be assumed for perfective aspect forms suffixed by the temporal deictic enclitic (Figure 165). Although spelling support is absent for root transitives, similar cases of 1.e.ii schemes are testified among derived transitives (Figure 172b). As the temporal enclitic is the only morpheme attested to follow the perfective suffix, no grapheme alternation from =**ji** / __# needs to take place to ensure an integrative spelling, and such **yV$_1$=CV$_1$=ji=ya** spellings continue to be classified as a 1.a.ii scheme for a *y-V$_1$C-V$_1$j=iy* form. Such perfective verbs syllabify in a canonical *[jV.CV.xij] form, specifically *[ja.la.xij] for *y-al-aj-Ø=iy*.

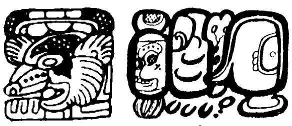
[936] The drawing is somewhat inconclusive with regard to the line management. A comparison with the original on the plaza in front of Structure 3 reveals the prefix to be indeed the allograph HE6(3) for **u**, while the main sign seems to mis-perceived as an anthropomorphic figure.

[937] The interaction with the suffix vowel would produce ***–VV$_1$j* as per harmony rule 2a (Lacadena and Wichmann 2004: 109), unless with a CiC root, which, however, is not attested. This epigraphic circumstance probably led MacLeod (2004) to reconstruct the ClM perfective with a long vowel, but absence in the epigraphic record does not imply impossibility for a **u-CiC-ij* form that would require a short suffix vowel as per harmony rule 1 (Lacadena and Wichmann 2004: 104). Interestingly, Lacadena and Wichmann (2005b: 35-36, tab. 3) do not consider it a problem to distinguish between ~ ***–aaj* and *–ij* as perfective alloforms, as they would form minimal pairs with the passive thematic *–aj* and their denominaliser ***–iij*; a pairing that is more phonetically than functionally induced and thus of little credibility.

a b

Figure 165: Examples of perfective root transitive verbs with a non-syncopated suffix in non-final position. **a) ya=a-la=ji=ya** (CPN Alt. K, M1), **b) ya=la=ji=ya** (COL Shl. Cleveland, C2).

Root transitive verbs of a CVC shape taking the ~ *=iy* temporal deictic enclitic (Figure 166) syncopate the perfect aspect suffix vowel, where the spelling of **=ji=ya** / __# indicates *–j=iy*, in accordance with the line of evidence made for passivations (see Figure 62) and inchoatives (Figure 75). Only two examples are known, but at least the one with a full syllabic spelling (Figure 166b) features a synharmonic root pattern to be expected at a C.C morphemic boundary. Such **u=CV$_1$-CV$_1$=ji=ya** / **u=CV$_1$C=ji=ya** spellings for an *u-CV$_1$C-j=iy* form classify as scheme 2.f.ii. The syllabification results in a canonical tripartite *[ʔu.CVC.xij] form, e.g. *u-mek'-j-Ø=iy* as *[ʔu.mek'.xij]; syncopation avoids a lengthier quadripartite **[ʔu.CV.CV.xij] that seems less favourable (see the discussion in relation to the passive for Figure 61 and the inchoative among Figure 74 and below in relation to Figure 172e).



a b

Figure 166: Examples of perfective root transitive verbs with a syncopated suffix in non-final position. **a) u=DOG.HEAD=ji=ya** (TIK St. 31, F7)[938], **b) u=me-k'e=ji=ya** (PAL 96G, E6).

Underspellings of root transitive verbs in perfect aspect (Figure 167) are rare, and are attested in two different forms: (1) as a 2.g.i scheme that truncates the root as **u=CV$_1$=ji** for *u-CV$_1$[C]-[V$_1$]j*, thus not providing the suffix vowel; and (2) as a complete underspelling of a syncopated suffix with **u=CV$_1$-CV$_1$=ya** for *u-CV$_1$C[-j]=iy*, classified as scheme 2.g.ii (note the synharmonic spelling at the underlying C.C boundary). Interestingly, such 2.g.ii cases are not attested among the passive (despite its larger sample size) or the inchoative.

a b

Figure 167: Examples of perfective root transitive verbs with different underspellings. **a) u=chu-ku=ya** (YAX Lnt. 46, F9)[939], **b) u=pe=ji** (CRN P. 1, H5)[940].

[938] The sign has tentatively been classified as AP5, which is otherwise **OK.** No decipherment or reading is currently possible. The inflection with the *u–* / __C pronoun prompts for a CVC morphograph. This block is considered as the predicate of a secondary information, as it follows a *t'ab[-ay]-Ø[-i] wi[']-te'-nah* event conducted by *Yax Nun Ahin* I (blocks E5-F6). The perfect verb binds *kalomte'* as the only expressed argument, possibly referring to *Sihaj K'ahk'*.

[939] See Chapter 4.1.5 for alternate explanations of the **=ya** suffixation and footnotes 719 and 721 for similar debated cases. The case of the **u=WE'=ji=ya** spelling on YAX Lnt. 35, D7 (Figure 82f) that was included by MacLeod (2004: 297) among the list of perfect verbs. This neglects that the transitive form of "to eat" is *k'ux* (also see footnote 364). Read as **u=WE'=ya** only, Stuart Houston and Robertson (1999, II: 36) consider a nominalisa-

As MacLeod (2004: 294) pointed out, a limited lexical range of derived transitives comprises the largest quantity, as the statistical analyses confirmed (Chapter 3.3.3.7 and Table 68). A brief overview of the base lexemes, their derivations and their match in Ch'olan languages (MacLeod 2004: 311-312) provides ample evidence for transitivised nouns and few positional roots. Among derived transitive verbs, the most important question is whether the stem-formative suffix is elided or retained und thus triggering a morphophonemic assimilation process from ***–V-V$_1$j > –Vj*, in accordance with the altered reconstruction for the suffix phonology (Chapter 3.1.7).

Integrative spellings of derived transitives with a *–V* stem formative (Figure 168) therefore mirror the suffix vowel in the perfect suffix, with a variety of spelling schemes applying with the standard **=ji** / __# pattern: (1) either as schemes 1.a.ii, 1.b.i, 1.c.i, 1.c.ii, and 1.d.ii with **CV$_1$-CV$_1$ / CV$_1$C-CV$_1$ / CV$_1$-CV$_2$ / CV$_1$C-CV$_2$** > **u=CV$_1$-CV$_1$=ji / u=CV$_1$C-CV$_1$=ji / u=CV$_1$-CV$_2$=ji / u=CV$_1$C-CV$_2$=ji** (and analogously with ʔVC roots) for a *u-CV$_1$C-V$_1$j* / *u-CV$_1$C-V$_2$j* (and *y-V$_1$C-V$_2$j*) form; (2) as 1.e.ii with **V$_1$-CV$_2$ / V$_1$C-CV$_2$** > **yV$_1$=CV$_1$=V$_2$-ji / yV$_1$=V$_1$C=V$_2$-ji** for a *y-V$_1$C-V$_2$j* form; and (3) as 1.e.iv with **CV$_1$C** > **u=CV$_1$C=V$_1$J** for a *u-CV$_1$C-V$_1$C* form. The regular difference between stem and suffix vowel (*kab-a* is the only synharmonic stem) can easily be observed in the epigraphic record, and is also stringent with the orthographic realisation among indicative status verbs (compare Figure 168g with 105d and 168h with 105e), with exceptions among *il-a* which seemingly prefers a spelling with **yi=li** (compare Figure 168e-f with 105a). As the intersection between indicative and perfective samples is not overly capacious, further support needs to be contributed by *–CV* derivations (Figure 170). But the deliberate spelling by 1.e.ii schemes with **=a-ji** / __# among *il-a* is best support for stem-vowel assimilation, as already pointed out by MacLeod (2004: 299-300, 312).

tion, together with the present **u=chu-ku=ya**, but also with the frequent **u=KAB=ya** (Figure 174f). If indicating the *–ya(j)* nominaliser of transitives (Table 56), it might be a theoretical analysis for *chuk* and *kab-a*. The present example has to be interpreted as a perfect when investigating the narrative: a regular *chu<h>k-aj-Ø* statement in block F3 informs about the capture of an *ajaw* from *Buk-Tun* by *Itzamnaj Bahlam* II as the main event. As the secondary information, **u=TZ'AK^{ka}=bu u=to-k'a pa-ka-la JOY=BALAM** < *u-tz'ak-b-u[j]-Ø u-tok' [u-]pakal joy-Ø+ba[h]lam* (see Figure 174g) follows; a reference to the earlier king Knot-Eye Jaguar II. The illustrated *u-chuk[-j]-Ø=[i]y* perfect follows the first perfect, the **=ya** suffix indicates the temporal enclitic for a related, but anterior event to the ordering of the flint and shield. The same structure is visible on PNG Trn. 1, A'1, where *u-chuk[-j]-Ø=[i]y* appears after the perfect *y-ak-t-aj-Ø* (Figure 170a) in block Z5. Hence, the possibility that all **u=KAB=ya** spellings also represent 2.g.ii spellings for the perfect is very high, instead of being functionally equivalent nominalisations.

[940] This block is interpreted as a perfective scheme 2.g.ii underspelling, even though it appears in primary position after a Calendar Round associated with the Long Count 9.12.1.6.19. I analyse the whole phrase as follows: **u=pe=ji KAL=TE' yu=ku CH'EN^{na}** < *u-pe[k-e]j-Ø kal[-om]+te' y-uk[-n-om] ch'en*, "*Yuknom Ch'en* II has announced *Kalomte'*." This connects via a *wak-lat* count from the event of the previous date: **BIX=na chi-ku NAB su-ku WINIK ch'o-ko K'INICH je OK** < *bix-[a]n-Ø chik na[h]b suku[n] winik ch'ok k'inich je ok*, "the older brother person youth *K'inich Je Ok* was going (to) *Chik Nahb*" (CRN P. 1, H2-H3). The journey of the La Corona lord to Calakmul was therefore for his proclamation as a *kalomte'* by his overlord *Yuknom Ch'en* II. The text continues with various other ritual activities and investitures (Canuto et al. 2008: 28). However, we do not find *K'inich Je Ok* associated with the *kalomte'* title in his nominal phrase. The reverse interpretation, an acquisition of the *kalomte'* title by *Yuknom Ch'en* II (with *K'inich Je Ok* arriving at Calakmul to witness it) would be awkward to appear so late in his reign. On CNC P. 1, C8-C9 he is already named an *ux-te' tun kalomte'* on 9.11.4.4.0, although this might be a retrospective attribution, as the panel dates into the 18th *K'atun*. More importantly, if *Yuknom Ch'en* II would indeed be the recipient ("announced as *kalomte'*"), the construction would involve a prepositional phrase, compare to *chum-wan-Ø ta ebet*, "he was seated (as) *ebet*" (TRT Bx. 1, O1-P1).

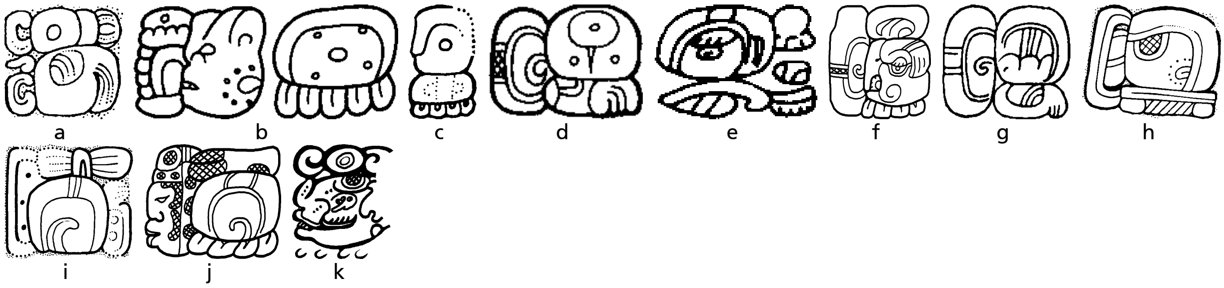


Figure 168: Examples of perfective derived transitive verbs with integrative root spellings. **a) ya=ti=ji** (TNA Mon. 134, A9), **b) a=ch'u-bi=ji** (PNG P. 3, Y2-X3)[941], **c) ye=ta=ji** (UXL St. 8, 3b)[942],

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[941] Proposed translation for *ch'ub-i*: "to deposit, to care". I follow the line of argumentation made by Bíró (2011c: 304-309) regarding the decipherment proposal for the unclassified bat head sign and the isolation of the verbal stem. The lexical evidence provided indeed suggests a derived transitive verb. Based on the **bi** sign taken as evidence for an integrative spelling, I reconstruct the ClM form with the usative *–i* suffix. The example has been classified a 1.c.i scheme, as the nominal **u=ch'u-ba** spelling on CPN Str. 9N-82 HBh. 1, O1 suggests a disharmonic root spelling that is again modified by the verbal derivation.

[942] No decisive translation can be given for *e[h]t-a*. It is even unclear if this is indeed the underlying stem, which is only inferred by semantic and orthographic considerations. See Figures 169b and 171a-c for further examples, especially **ye=ET=je** is common in Palenque. To explain the semantic equivalency of all substitutions, the reading of ZZ5 as **ET** ~ **TE'** has to be discussed, as first proposed by Stephen Houston in 1991 (cf. Stuart 1998: fn. 5). There are indeed contexts that favour **ET** because of the prefixation with **ye**=, see footnote 725. Others are less conclusive, such as the supposed proper building name *e[h]t-nah* on PAL HCHS, C12b. Crucial is also a supposed equivalency to unclassified variants of **TE'** in a few *te'-[e]l kakaw* expressions (Figure 86i). The apparent full variant complex sign features the same foliation element on top (unlike the 2G1 grapheme) as ZZ5 does, it also has the same inner vertical curve with the double bulge; but it lacks the tri-lobed lower edge. Further support for the grapheme equivalency comes from ZZ5 appearing in the spelling **ya=AJAW=TE'** on PAL T19B-S, W3a, an expression whose substitution patterns have long been firmly established (Schele 1991: 46). Also see the sign substitutions in Figures 169b and 171b in identical contexts from the same inscription. A thorough context analysis is still pending, but apparently XGC and 2G1 primarily read **TE'**, while ZZ5 is **ET**; and only occasionally both signs overlap. – When turning to the reading of ZZ5, it is important to stress that the supposed underlying verbal stem is not related to the Ch'olan or Yukatekan meanings, see pCh **eht-ä*, "probar // try" (Kaufman and Norman 1984: 120) and YUK *et*, "tener en la mano" (Barrera Vásquez 1993: 158). More viable is the nominal(ised) GLL cognate set *e(h)t* with the broad meaning range "co-…, company, friend, work, semblance". Out of this domain, Riese (1982: 281-283) established his decipherment as a war-context relational noun, connecting a defeated person or site with the protagonist. But *e[h]t* in this meaning also appears in other, non-war contexts, such as **ye=te k'a-ba=li** < *y-e[h]t+k'aba[']-[i]l-Ø*, "he (is) the name-sake of NN" on TRT Bx. 1, J2-K1, see YUK *etk'aba'*, "de un mismo nombre con otro, o pariente muy remoto de solo nombre" (Barrera Vásquez 1993: 160). Despite the morphographic root spelling, Riese also noted substitution patterns that are particularly popular in the Usumacinta area. One example is the capture record of the same *Buk-Tun* lord also mentioned on YAX Lnt. 46 (footnote 939) on YAX HS. 3 I tr, D1b-C4, where the expression substitutes for *u-bak-Ø*, "he (is) the captive of NN": **chu-ka=ja AJ K'AN$^{\text{na}}$ u=si-ja bu-ku=TUN$^{\text{ni}}$=AJAW ye=he-TE' 5=WINIKHAB ch'a-ho=ma u=CHAN$^{\text{nu}}$ AJ BAK$^{\text{ki}}$ ITZAM BALAM K'UH PA'=CHAN AJAW** < *chu<h>k-aj-Ø aj k'an u-sij buk+tun ajaw y-eht-Ø jo' winikha'ab ch'ah-om u-chan aj bak itzamnaj ba[h]lam k'uh pa'+chan ajaw*, "*Aj K'an Usij* was captured, it (was) the 'work' of the 5-*K'atun* Lord, the Scatterer, the Guardian of *Aj Bak*, *Itzamnaj Bahlam* II, the Yaxchilan God-King." The spelling (also as ~ **ye=je=TE'**, e.g. YAX HS. 5 I, 82) appears in functional equivalent contexts, and is suggestive of *e[h]t*, including the root-internal /h/. Intriguing is the constant use of 2G1 **TE'**, if the spelling is not interpreted as a relational noun, the final morphograph could spell out **y-e[h]t-e'-Ø*. WCh has *–e'* as a completive marker, although only of root transitives. Alternatively, it indicates a regional *–ej* > *–e'* sound shift of the perfect. And frequently, ZZ5 **ET** does not appear with a **ye**= < *y–* 3SG.ERG / __V prefixation that would be required for a relational noun and likely requires reconstruction, such as in the Yaxchilan king list, e.g. **u=7=TAL$^{\text{la}}$ CHUM=AJAW ja-tz'o JOL PA'=CHAN AJAW ET ITZAM K'AN AK yo=ki-bi AJAW** < *u-huk-tal chum-Ø+ajaw-Ø jatz' jol pa'+chan ajaw-Ø [y-]e[h]t-Ø itzam k'an a[h]k y-okib ajaw* (YAX Lnt. 49, C4-C7), "it (was) the seventh lord-seating, it (was) Moon Skull, the Yaxchilan king, it (was) in the company [of] Ruler A, the Piedras Negras king." Besides an underspelling, several other contexts also suggest that *e[h]t* may form a nominal compound or act as an intransitive stem to explain the absence of an ergative pronoun. – Many morphosyntactic, grammatical and semantic aspects of the 'victor' hieroglyph still remain opaque and request further review; and besides different lexical classes, cognate forms with different orthographies (and slightly different meanings) might appear in the inscriptions. But as clear nominal cases do not feature any suffix and the sign position within a block is clearly different between the Usumacinta spellings and the illustrated cases, the =**jV** suffixation has to

d) yi=la=ji (PNG P. 3, J1)[943], **e)** yi=IL=a-ji (CRC St. 6, B20), **f)** yi=li=a-ji (PAL TI-M, C3), **g)** yi=ta=ji (REJ ST. 1, F7), **h)** u=KAB=AJ (NAR Alt. 2, B4)[944], **i)** u=ma-yi=ji (TRT Bx. 1, S4)[945], **j)** u=MAY-yi=ji (PAL PT, G14), **k)** yu=xu-lu=ji (PAL 96G, I4a)[946].

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indicate a grammatical suffix, of which the perfect is the most obvious analysis. In the sampled cases, the expression fulfils the criterion of a secondary verb, also after stative predicates, e.g. PAL TABL, E2-H3 (Figure 171c): **la-ja u=MAY TUN=a NAH 2=WINIKHAB AJAW K'INICH ja-na-bi pa-ka-la K'UH BAK=la AJAW u=k'a-li ye=TE'=je 2=WINIKHAB AJ K'UH=na AJ su-lu** < *laj-Ø u-may tun-a['] nah cha'-winikha'ab ajaw k'inich janab pakal k'uh bak-[a]l ajaw u-k'al-i-Ø y-e[h]t-[e]j cha'-winikha'ab aj k'uh[u]n aj sul*, "complete (is) the *May Tuna'* House of the 2-*K'atun* Lord *K'inich Janab Pakal*, the Palenque God-King, it (was) his binding, he has 'worked' it, the 2-*K'atun Aj K'uhun*, *Aj Sul*." The three identical spellings from UXL St. 8 and also the one from JMB St. 1 (Figure 171a) with **ta** further suggest that the stem-formative vowel is the factive *–a*, hence **ye=ta=jV** can be analysed as *y-e[h]t-aj-Ø* and tentatively translated as "he has worked/done it." The cases of **ye=ET=je** ~ **ye=TE'=je** restricted to Palenque then might indicate a local spelling variant, as supposed by other =**je** suffixations (MacLeod 2004: 300). In this case, it is likely an orthographic re-interpretation of the [ə] allophone (see footnote 922). The same pattern may also apply to the **ya-le=je** spelling (Figure 164c) which MacLeod interpreted as evidence for a ClM *–ej* perfect participle (see footnote 495). When viewed as a perfective, the case still remains enigmatic and replaces one caveat with another problem, as no ergative pronoun is written. But such omissions appear, e.g. **ya-AL** < *[u-]yal-Ø-Ø*, "it is a throwing" (YAX Lnt. 10, F5a) and require reconstruction, hence *[u-]yal-ej-Ø*. But when considering the WCh pattern that the suffix vowel of a CaC root is often /ä/, the spelling would support the case of allophonic variation with the root final **le** and the =**je** / __# perfective suffixation pattern typical for Palenque. If the assumption proves true, we might reconstruct the phonetics as *[ʔu.ja.ləx]. Interestingly, data from Attinasi (1973: 217) on the CHL factive suffix testify *–ʌ* ~ *–e* as allomorphs, so the Palenque spellings might indeed be evidence for a spoken vernacular influence from WCh.

[943] Several authors (Houston and Stuart 1992: 591, Stuart 1995: 85) have suggested that selected occurrences of *il-a* on monuments might refer to the public lecture of its contents upon their dedication or a lengthier oral tradition that was condensed in the inscription. CHR has *iron* as "read" (Wisdom 1950: 484), but dictionaries from the remaining Ch'olan languages do not exhibit further attestation. As Stuart (1995: 85) pointed out, such interpretation may be difficult to confirm by context analyses, but in fact, most cases clearly indicate an act of witnessing, e.g. **CHOK=wi ch'a MUY=la CHAK yi=IL=a-ji yu=ku=no CH'EN**$^{\text{no}}$ < *chok-[o]w-Ø-ch'a[j] muy-[a]l cha[h]k y-il-aj-Ø yuk-n-om ch'en* (UXL St. 12, B5-B8), "*Muyal Chahk* droplet-scattered (and/while) *Yuknom Ch'en* has witnessed it." Perfective examples rather do not support such interpretation, as their secondary position usually enforces the testimonial of the primary action. Unless a clear verbal argument such as *u-woj-il* is provided, only a text-final occurrence with the semantic patient not expressed may be considered in favour of a public lecture, but the evidence remains faint.

[944] The monument's narrative provides support for a perfective reading: it mentions three times **ja-tz'a**(=**ja**) **u=bi=TUN**$^{\text{ni}}$ < *ja<h>tz'-a(j)-Ø u-bi[h]+tun*, "struck was the 'stone-road' of NN", with three different king names following, the formula *jatz' bih+tun* might here refer to the opening of a causeway (Stuart 2007b). The first instance, connected to *Aj Wosal*, features the secondary *u-kab-aj-Ø* expression in its function to re-introduce the agent (cf. Baudez & Riese 1990: 114-115) after an impersonal, intransitivised event description. The actor is named $^{\text{no}}$**NOH ?**$^{\text{na}}$ **xa-ma ?**$^{\text{na}}$ **AJ sa** < *noh[ol] ? xam[an] ? aj sa['-al]*, "the South ? (and) North ?, those of Naranjo" in blocks A5-C1. The only peculiarity in the **KAB** sign is the rendition of one stone marking instead of the second earth marking in the lower right corner. – See Figure 105e and footnote 807 for the 2IND **u=ka-ba=wa** example as strong support for the *–a* factive suffix. But the morphographic scheme 1.e.iv suffixation with =**AJ** is key to determine the stem-formative suffix. Since Stephen Houston's (cf. Stuart, Houston and Robertson 1999, II: 98) proposal, it has always been suspected on the basis of the Colonial TZO verb *chabi*, "govern, guard, watch over" (Laughlin 1975: 107, 1988: 184) that the ClM cognate is *kab-i*, with the usative *–i* 'use / take for' derivation (while the Tzeltalan cognate is *–in* [Kaufman 1994, A 8: 53]). Apparently, the verbal stem-formation in ClM was rather achieved by the factive *–a* 'do / make X'. The spelling with =**AJ** not only testifies this fact instead of the perpetuated ***u-kab-ij-Ø*, but also the vowel assimilation with the stem-formative of the underlying *–*V_1*j* suffix. – Some discussion is still required in relation to the morphology, as several authors assume a nominal form instead. Spellings of **u=KAB=ji** have occasionally been considered as a nominal form, as there are potential *–Vj* nominalisers (see Chapters 4.1.5 and 4.1.9), although cited examples are rather realised by =**ja** (see footnotes 596, 603 and 666). Stuart (2011: 2-3) recently reinforced a nominal nature, although it would then be a nominal derivation of a noun instead of a verb as in the other proposed instances. Nicholas Hopkins was also able to attest a CHL nominal paraphrase "responsibility" for *kab* (Harri Kettunen, written communication, April 28, 2012) in a biblical context. However, the overwhelming frequency in secondary position and the patterns with the temporal enclitic suggest that it is indeed a derived transitive verb. In this sense, the **u=KAB=ya** (Figure 174f) spellings that comprise 17.0% of all *kab-a* 4TEMP samples, are not nominalisations, but underspellings (see footnote 939) of the complete 2.f.ii scheme **u=KAB=ji=ya** spellings (59.8%). – Another comment concerns the temporal horizon of *u-kab-aj-Ø* as a relational expression. For the western Belize region, Helmke et al. (2006: 74) credit PAC St. 6

Most examples of non-integrative perfective spellings (Figure 169) are morphographic roots, classified as schemes 2.e.i and 2.e.ii, depending on the suffix vowel to be reconstructed: **CV$_1$C / V$_1$C** > **u=CV$_1$C=ji / yV$_1$=V$_1$C=ji** for *u-CV$_1$C-[V$_1$]j* / *u=CV$_1$C-[V$_2$]j* or *y-V$_1$C-[V$_2$]j* forms. Only one example with a stem-harmonic complement not incorporating the vowel as **yV$_1$=V$_1$C^{CV_1}=ji** (Figure 169d) is known, classified as scheme 2.d.i. The correct suffix vowel based on the stem-formative has to be derived from the lexical evidence reflected in integrative spellings.

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from *K'atun* interval 9.2 to be the earliest example, predating attestations from 9.4 in Caracol and 9.5 in Naranjo. The case of NAR St. 25 also simply considers the context date, while the contemporary date falls into 9.9. However, in the whole Maya area, the expression occurs as early as 8.18 in Balakbal, while other 9.2 examples are known from CPN St. 60 and JOY St. 1. I would also contradict the view that *u-kab-aj-Ø* has its "greatest frequency in royal accession statements" (Helmke et al. 2006: 74), considering the many intransitivised statements to which the agent is re-introduced.

[945] Proposed translation for *may-i*: "to offer". Traditionally, ***may-ij* is considered as a derived noun (involving the *–ij* nominaliser) for "gift, offering, sacrifice" (Boot 2009b: 129, Robertson, Houston and Stuart 2004: 286, Stuart 2005b: fn. 45). The CHT evidence provides both a verb <Dar de grasia *Çij maij*> and a noun <Don. dadiba. oferta. *Maij. cij.* idem.> (Morán 1685-95: 105). Robertson, Houston and Stuart (2004: 286) consider the CHT noun ***mai'i* as the nominalised reflex of a ClM ***mayV-ij* perfect. I first doubt the CHT reconstruction based on Morán's orthography, as it exhibits a diphthong (<i> = <j>), unless **mayi* is intended. The reconstruction also operates with a VV > V' rule that becomes obsolete when the first /i/ or even /ii/ is taken as /y/. In the case of <*Çij*>, it might reflect the sound change to *siy* (see footnote 672) rather than the pCh and ClM *sih*. The presence of a /y/ is further supported by <haser prosesion. *Xoii* de. X *xoipael.* neu°> (Morán 1685-95: 124), which exhibits the same orthography for a verb that is undoubtedly a reflex to ClM *joy*, "to bind" (cf. Gronemeyer and MacLeod [2010: tab. 3] for a GLL cognate set). Robertson, Houston and Stuart (2004: 286) also neglect the fact that Morán provides both the verb and the noun with the same <*maii*> spelling, considering that ECh transitives feature a *–V* thematic suffix (Table 36). While in one case, the noun *may* might be intended, the verbal *mayi* might be indicated at the same time. Compare Morán's <*Xoii*> with CHR *hoyi*, "make fitting, make proper, make satisfactory" (Wisdom 1950: 468) and the contrasting <*xoipael*> with only one /i/ as the incompletive ECh passive **joy-p-a[']-el* (cf. Sattler 2004: 377-378). To summarise, Morán's <*ii*> ~ <*ij*> potentially reflects three distinct sound environments: /ih/, /yi/, and /y/, and the entries in Morán are therefore a problematic to argue for the reflex of a certain etymology with underlying forms and sound changes. – MacLeod (2004: 322) was the first to propose a derived transitive *may-i*, "to give a gift", based on the noun *may*, "gift", a proposal other authors (e.g. Bíró [2012: 40] who considers a root transitive, though) and I basically second. Possibly, it is semantically related to the provision of supernaturals. Stuart (2005b: fn. 46) related the phrase to the scene of tongue bloodletting on the back of YAX St. 35. While the accompanying expression (Figure 139c) is here considered to base on *ch'ab* (see footnote 878), Stuart read the heavily eroded main sign as *may*. When following this line of argumentation, the phrase would analyse as **u=BAH^{ji} ti **MAY-yi=hi** < *u-bah-Ø ti **may-i[j]-Ø*, "it (is) her image in becoming gifting" and could be considered a nominalised inchoative of the noun *may*, parallel to the well attested *u-bah-Ø ti a[h]k't-aj-Ø* expressions (Figure 139a-b). This interpretation is problematic in several respects: (1) while *ch'ab* (although not as a nominalised mediopassive) is well attested in contexts of bloodletting, *may* is not; (2) the front side repeats the action with **u=BAH^{ji} ti $^{ch'a}$CH'AB ti AK'AB=li** < *u-bah-Ø ti ch'ab-Ø ti ak'ab-[i]l* (YAX St. 35, H4-I1) following a *tz'a<h>k-aj-Ø* phrase related to the 'vision serpent' scenery (see footnote 789); (3) the spelling imposes an ~ *–ij* allomorph of the inchoative that is still doubtful (see Figure 72); and (4) **=ji** ~ **=hi** / __# is extremely uncommon among inchoative spellings (indeed one case out of 331 samples, Figure 69c). – As MacLeod pointed out, *u-may-ij-Ø* frequently appears in secondary position after another verbal phrase, e.g. on TRT Bx. 1, S2-S5: **PAT=la-ja yo=OTOT^{ti} u=ma-yi=ji AJ k'a-xa** < *pat-laj-Ø y-otot u-may-ij-Ø aj k'ax*, "his house was formed, *Aj K'ax* offered it", mirroring the paradigm of perfect verbs. The spellings with **yi** (Figure 168i-j) also enforce the *–i* usative stem-formative suffix that assimilates with the *–V$_1$j* perfect suffix.

[946] The case of *uxul* is problematic, its **u-xu-lu** spelling indicates a reflection of the stem vowel possibly with the inchoative (Figure 72f), but also the among the mediopassive (Figure 127j), as if it where a root transitive, but ***–u* is not attested as a verbaliser of nouns. Its passive follows the *–C-aj* pattern of non-CVC and derived transitives, exhibiting the same synharmonic spelling at a C.C boundary (Figures 58k, 60p, 61m, 64c). I therefore deviate from MacLeod (2004: 306) who assumes the usative *–i* suffix, which would yield a transcription as **y-uxul-[i]j-Ø* and require a 2.a.i scheme.

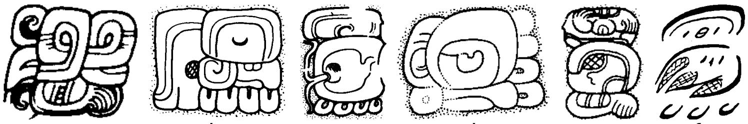

Figure 169: Examples of perfective derived transitive verbs with non-integrative root spellings. **a) ya=AT=ji** (CPN Str. 10L-26 Papagayo Step, D3), **b) ye=ET=ji** (PAL U055, pA5), **c) yi=IL=ji** (DPL P. 19, F1a), **d) yi=IL^{li}=ji** (UXL St. 12, B7), **e) u=KAB=ji** (CRC St. 3, A20b), **f) u=MAY=ji** (CML U. 26 Pdt. 18, A7).

Except *uxul* (Figure 168k), all verbalised nouns attested so far in the epigraphic record follow a regular CVC root. Therefore, the syllabification of these derived transitives is not different to those of root transitive verbs in perfective aspect with bisyllabic *[jV.CVx] or trisyllabic *[ʔu.CV.CVx] forms, e.g. *y-il-aj-Ø* as *[ji.lax] or *u-may-ij-Ø* as *[ʔu.ma.jix]. Even *y-uxul-uj-Ø* syllabifies into a canonical *[ju.ʃu.lux], if not even *[juʃ.lux], if the principle of secondary vowel syncope (see footnote 680) applies.

Spellings with *–CV* transitivisers among derived transitives (Figure 170) are also best support for vowel assimilation. Because of their suffix structure, all examples with =**CV=ji** / __# classify as 1.f.ii schemes, as e.g. the passive of derived transitives (Figure 58): **V$_1$-CV$_1$** / **CV$_1$-CV$_1$** / **CV$_1$C** > **yV$_1$=CV$_1$=CV$_2$=ji** / **u=CV$_1$-CV$_1$=CV$_2$=ji** / **u=CV$_1$C=CV$_2$=ji** for *y-V$_1$C-C-V$_2$j* / *u-CV$_1$C-C-V$_2$j* forms. The syllabic and complemented examples (Figure 170a-c, e) all feature the expected synharmony at the C.C boundary, but are otherwise not attested as disharmonic root spellings (compare Figure 170b with 99j and 170e with 99l-m).

Especially the positional causative =**bu** / … < *–bu* is attested in other contexts that also impose vowel assimilation with the following suffix, therefore the spellings for the perfect are also integrative in accordance with the antipassive (compare with Figures 124e, 125f) and the mediopassive (compare with Figures 129g, 132c). Unfortunately, no instance of the pYu =**ba** positional causative (e.g. **u=pa-ka=ba ti-i=li** < *u-pak-ba-Ø ti'-il*, CHN MON-L2, C5) is known in such a context to further pinpoint such observation. Such derived transitives either syllabify into a bi- or tripartite form, such as *y-ak-t-aj-Ø* as *[jak.tax], or *u-tz'ak-b-uj-Ø* as *[ʔu.t͡s'ak.b'ux].

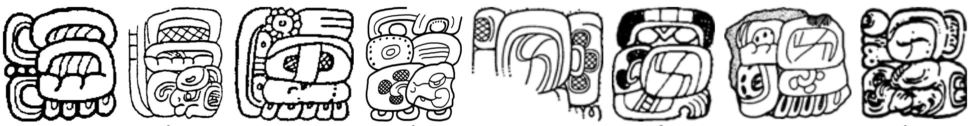

Figure 170: Examples of perfective derived transitive verbs following a *–C(V)* suffix. **a) ya=ka-ta=ji** (PNG Trn. 1, Z5)[947], **b) u=pa-ta=bu=ji** (CPN St. 48, Ap1), **c) u=PAT^{ta}=bu=ji** (CPN Alt. U, J2), **d) u=PAT=bu=ji** (CRN Msc. 06-2011/PH, B1a), **e) u=TZ'AK^{ka}=bu=ji** (PMT Mon. 11, Ap2)[948], **f) u=TZ'AK=bu=ji** (TIK St. 31, D7), **g) a=TZ'AK=bu=ji** (PAL T18S, 237b), **h) u=10=TZ'AK^{ka}=bu=ji** (CPN St. 6, C1)[949].

[947] Proposed translation for *ak-ta*: "to loose, to drop". Boot (2009b: 20) translates as "to abandon", cf. CHN *äctan*, "dejar" (Keller and Luciano 1997: 35) and *äk-t-an*, "to let s.t. go, to let s.t. loose" (Knowles 1984-88). In comparison with other lexical evidence, I would like to slightly shift and enlarge the meaning, cf. CHR *ak'ta*, "leave alone, forget about, abandon, neglect, turn loose, permit, unload, unhand, free (as a captured animal), abstain from" (Wisdom 1950: 449). This lexeme with its single occurrence is the only example of the *–ta* super-

Deviations of the standard **=ji** / __# suffixation among derived transitives (Figure 171) are rare and are interestingly only attested with ʔVC-V stems. Most instances apply **=ja** / __# as a harmonic spelling to the stem-formative in an integrative 1.a.i or 1.c.i spelling with **V$_1$-Ca** > **yV$_1$=Ca=ja** for a *y-V$_1$C-aj* form. While the use of **=je** / __# with *e[h]t-a* in Palenque may be phonemically triggered (footnote 942), the likewise exclusive **=je** / __# pattern with *it-a* in Chichen Itza is elusive, but likely not an indication for a pre-pYu **–ej* (MacLeod 2004: 300). It may be a sign of the Yukatekan topical enclitic *=e[’]* among verbal statements for prosodic phrasing (Skopeteas 2010: 312) in a case of diglossia with a Ch’olan perfect (in contrast to Yukatekan *–m-aj*, see Table 62), analysable as *y-it-aj=e[’]*. One example (Figure 171e) basically retains the standard suffixation, but neglects the orthographic distinction between /j/ and /h/ by applying **=hi** / __#. As only ʔVC-V stems are attested with deviant suffixations, a case-to-case distinction needs to be made to nominalised passivations, as these stems to not follow the *–n-aj* ~ *–w-aj* (Figure 57), but no such nominalisation is attested with a ʔVC-V stem.

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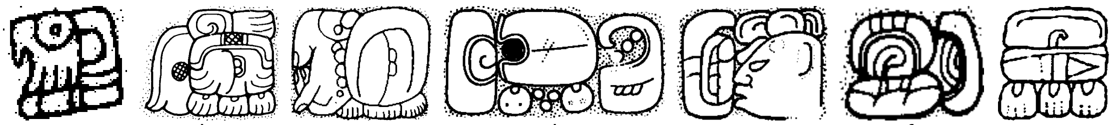
factive suffix in ClM. Although it derives a transitive verb from a noun as *–a* and *–i*, I nevertheless list it among the positional causative *–bu* because of its *–CV* structure.

[948] The *u-tz’ak-b-uj-Ø* examples considered here follow the analysis by MacLeod (2004: 294-296) as the perfect of a causative positional. As with other perfect aspect spelling (see footnotes 939, 944 and 945), several authors (e.g. Boot 2009b: fn. 249, Robertson, Houston and Stuart 2004: 284-287) have analysed a nominalised form derived by a *–Vj* suffix. The perfective examples are different in context to the ‘count in succession’ expression (Mathews 1975, Riese 1984) that is a derivation either achieved by (1) a nominalisation, e.g. on TIK St. 5, B4-B6: **yi=K’IN CHAN K’AWIL u=26=TZ’AK=bu=li YAX EB YOK K’UH MUT AJAW** < *y-i[’]+k’in chan k’awil-Ø u-wak+k’al tz’ak-b-ul yax e[h]b xok k’uh mut[-al] ajaw*, “*Yi’k’in Chan K’awil* (is) the 26th (in) order (since) *Yax Ehb Xok*, the Tikal God-King”; or (2) an adjectivisation, e.g. on COL St. Randel, H4-I1: **18 tz’a-ka=bu=li sa-ja** < *waxaklajun-Ø tz’ak-b-ul saja[l]*, “18 (are) the ordered *sajal*.” Typically, the perfective *tz’ak* stands in secondary position, e.g. on PAL P. DOAKS2, C3-I1 (Figure 175c): **te-k’a=ja yo=OK tu=WITZ=li u=K’UH=li ha-i u=TZ’AK=bu=ji 3=? MAT K’INICH K’AN$^{\text{na}}$ JOY=CHITAM K’UH BAK=la AJAW** < *te<h>k’-aj-Ø y-ok t-u-witz-[i]l u-k’uh-[i]l ha[’]-i-Ø u-tz’ak-b-uj-Ø ux ? mat k’inich k’an joy-Ø+chitam k’uh bak-[a]l ajaw*, “his foot was placed in the mountain of his gods, it (was) him who has ordered it, *Ux ? Mat K’inich K’an Joy Chitam*, the Palenque God-King.” Further confirmation for a secondary perfective form is found among the instances on TIK St. 31 which are paired with *kab-a* to record the ordering of period endings under the supervision of specific rulers, e.g. TIK St. 31, C9-C14: **7 $^{\#}$AJAW K’AL=wi=TUN u=TZUTZ=wa 14=WINIKHAB UH-ti=ya ?=NAL$^{\text{la}}$ u=TZ’AK=bu=ji u=KAB=ji 6=CHAN$^{\text{na}}$? to-ko ICH’AK** < *huk ajaw k’al-[a]w-tun-Ø u-tzutz[-u]-Ø chanlajun winikha’ab uht-Ø=iy ?-nal u-tz’ak-b-uj-Ø u-kab-[a]j-Ø wak chan ? tok ich’ak*, “(on) 7 *Ajaw* he stone-bound, he sowed 14 *K’atun*, it happened (at) *?-Nal*, he has ordered it (and) *Wak Chan ? Tok Ich’ak* has supervised it.” If the Distance Number Introductory Glyph is considered a nominalisation as well (specifically an agentive, see Chapter 4.1.5), then also the graphemic indicators are different, while **=ji** in the presented contexts is the standard pattern for perfective verbs.

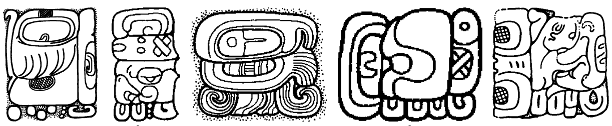
[949] It is not entirely clear whether the numeral 10 is included in this spelling. I suspect the representation of a (jaw)bone overlapping HE6(3) **u** to be a truncated version of the head variant SC1 **LAJUN**, as the expression stands in the context of the half-period ending of 9.12.10.0.0 (CPN St. 6, A7-B8). If the bone is not part of the **u** sign, then the transliteration mirrors the sign sequence within the block, but seemingly violates the morphosyntax, as the numeral stands between the 3SG.ERG *u–* binding the actor to the verbal stem. The actor is a collective of persons preceding the secondary information: **4=TE’ AJAW 4 ch’o-ko=TAK** < *chan-te’ ajaw chan ch’ok-tak*, “four lords (and) four youths.” There are two viable solutions to consider the numeral as a result of sign transposition: (1) as a stative predicate with *lajun-Ø u-tz’ak-b-uj-Ø*, “it (is) ten (what) they have ordered” or (2) as the patient with *u-tz’ak-b-uj-Ø lajun*, “they have ordered ten.” This information is followed by another perfective *u-kab-j-Ø=iy* statement (block C2) that introduces a supernatural (blocks C3-C4) presiding the ordering of time.



a b c d e f g

Figure 171: Examples of perfective derived transitive verbs with spellings deviating from the standard pattern. **a) ye=ta=ja** (JMB St. 1, Y1)[950], **b) ye=ET=je** (PAL U055, pA2), **c) ye=TE'=je** (PAL TABL, G2), **d) yi=IL-la=ja** (UAX St. 13, A4), **e) yi=ta=hi** (CRN HS. 2 1-V, C7), **f) yi=ta=ja** (CRC St. 3, D20a), **g) yi=ta=je** (CHN St. 1, J6).

A regular *–Vj* suffix in non-final position (Figure 172) is again conditioned by several factors identical to those laid out for root transitives (Figure 165), also in comparison with the passive (Figure 61) and the inchoative (Figure 174). Most instances are with *il-a*, irregardless of the enclitic alternant, with non-syncopation rarely indicated by 1.a.ii or 1.e.ii spellings, otherwise by 2.e.ii schemes. In accordance with the morphophonemic patterns attested in the other showcases, we can establish a canonical *[jV.CV.xij] and *[jV.CV.xi.xij] syllabification for Figure 172a-d, specifically *[ji.la.xij] for *y-il-aj-Ø=iy* and *[ji.la.xi.xij] for *y-il-[a]j-Ø=ij=iy*. The example in Figure 172e accordingly requires a fully pronounced perfect because of the ~ *=ij=iy* alternant as *u-kab-[a]j-Ø=ij=iy* with a rare five-part *[ʔu.ka.b'a.xi.xij] syllabification[951].



a b c d e

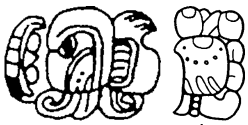
Figure 172: Examples of perfective derived transitive verbs with a non-syncopated suffix in non-final position. **a) yi=IL-la=ji=ya** (CNK P. Crystal River, pB3), **b) yi=li=a-ji=ya** (QRG St. E, C14a), **c) yi=IL=ji=ya** (COL P. Houston, E1), **d) yi=IL=ji=ji=ya** (PNG Alt. 1, F2)[952], **e) u=KAB=ji=ji=ya** (PAL UNKW, gly04).

Also in accordance with the morphophonemic pattern among the passive (Figure 62), the inchoative (Figure 75), and root transitive perfective verbs (Figure 166), a vowel syncope with derived transitive verbs occurs with ~ *=iy* among CVC-V stems (Figure 173). The only lexeme attested with such pattern is *kab-a*, except the defective spelling in Figure 173b, with **u=KAB=ji=ya** as a 2.f.ii scheme as *u-kab-j-Ø=iy* for a canonical trisyllabic *[ʔu.kab'.xij] form.

[950] The drawing is inconclusive to a certain degree regarding the grapheme identification. The reading has been verified by a comparison with the original monument.

[951] In comparison to 146 cases of 2.f.ii spellings with a syncopated *–j* / … suffix, only two perfective examples with *kab-a* feature the **=ji=ji=ya** sequence indicative of the ~ *=ij=iy* alternant of the temporal deictic enclitic. Compare to the slightly higher ratio among the passive (footnote 636) and the enhanced preference among the inchoative of *sih* (footnote 688).

[952] The featured drawing (Teufel 2004: 535) documents the block fairly accurate in comparison with a photo (Maler 1901: pl. 8). An alternative drawing by John Montgomery erroneously depicts the prefix as **u** and the suffix as **nu** – which are not viable graphemes in the given context.

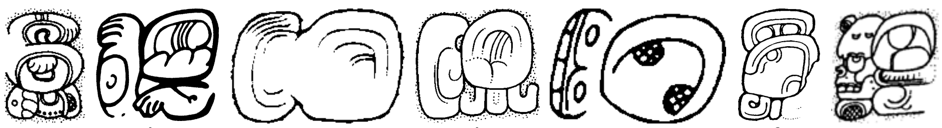


a b

Figure 173: Examples of perfective derived transitive verbs with a syncopated suffix in non-final position. **a) u=KAB=ji=ya** (RSB HS. 1, 7), **b) u=ba=ji=ya** (QRG St. I, D4b)[953].

Underspellings of derived transitive verbs (Figure 174) appear with a variety of spelling schemes: (1) as 1.g.i with an omission of the suffix spirant with **yV$_1$=CV$_2$=Ø / yV$_1$=CV$_2$=V$_2$-Ø / yV$_1$=V$_1$C=V$_2$-Ø** < *y-V$_1$C-V$_2$[j]* (Figure 174a-c) or as 1.f.i following a *–CV* transitiviser with **u=CV$_1$C^{CV_1}=CV$_2$=Ø** < *u-CV$_1$C-C-V$_2$[j]* (Figure 174g); or (2) as a 2.g.ii scheme completely omitting the **=ji** syllabogram among a morphographic root, either in final position with **u=CV$_1$C=Ø** < *u-CV$_1$C[-V$_2$j]* (Figure 174e) or syncopated in non-final position with **u=CV$_1$C=Ø=ya** < *u-CV$_1$C[-j]=[i]y* (Figure 174d, f).

In contrast to other showcases, underspellings among perfective verbs do not show any significant geographic or temporal clustering (as in the codices for passives, see Chapter 4.1.1, plain status intransitives, see Chapter 4.1.8, and incorporating antipassives, see Chapter 4.1.10). Scheme 1.g.i only has 7 samples mostly from the Central Peten and Mopan-Pusilha region, while the 45 2.g.ii samples distribute across all regions between *K'atun* intervals 8.18 and 10.18. Of these, 40 cases alone appear with *kab-a*, indicating a common practice to abbreviate this frequent expression (in comparison to 141 full scheme 2.f.ii samples).



a b c d e f g

Figure 174: Examples of perfective derived transitive verbs with different underspellings. **a) yi=IL=a** (CRC St. 3, C12a), **b) yi=ta=a** (NTN Dwg. 28, A18)[954], **c) yi=ta** (NAR St. 29, F12)[955], **d) yi=ta=ya** (ALM St. 10, B1), **e) u=KAB** (NAR Alt. 1, I2), **f) u=KAB=ya** (NAY St. 1, B2a), **g) u=TZ'AK^{ka}=bu** (YAX Lnt. 46, G7).

While agent fronting is a feature typically tied to the antipassive because of typological reasons (see Figures 123 and 124 and Chapter 4.1.11 for a discussion), it is not impossible with other verbal diatheses, as attested with a single indicative case (Figure 100a), but also three perfective constructions (Figure 175), where the agent is topicalised in a secondary statement. Of course, the agent can be accentuated by saying "it is he who has X-ed it", see the context of Figure 175c in footnote 948. In that sense, these examples also do not contradict the pragmatic paradigm that in most instances, the syntac-

[953] This spelling can be reconstructed to *u-[ka]b-j-Ø=iy* by context, as it connects the event of the stela erection by *K'ahk' Tiliw Chan Yopat* of Quirigua with the name of *Wamaw K'awil* of Calakmul.

[954] MacLeod (2004: fig. 11.3g) reads the block as **yi=IL=ji**. Considering that the subfix looks like a bent arm, I suspect that it is rather an abbreviated version of the grapheme MB1 **a** (Stuart et al. 1989: 4) equal to MB2 (= Z5 = T234) and thus an underspelling.

[955] Such underspellings need be carefully distinguished from indicative cases (see Figure 105d) by context. Generally, an attribution to showcase 4TEMP has been made in case the expression stands in secondary position following another verb or accompanied by another perfective verb within the same phrase, otherwise 2IND is assigned.

tic patient of the perfect verb phrase refers to the semantic patient of the preceding clause (MacLeod 2004: 292), but not the agent[956]. Irregardless of the agent fronting, the perfect verb may appear with or without the deictic enclitic.

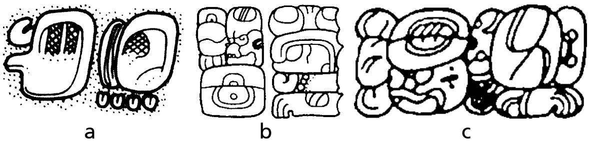


Figure 175: Examples of perfective transitive verbs with a topicalised agent. **a) ha-i u=KAB=ji** (COL Yax Wayib Mask, C6-D6), **b) ha-i u=KAB=ji=ya** (QRG St. E, D17b-C18a), **c) ha-i u=TZ'AK=bu=ji** (PAL P. DOAKS2, C5-D5).

In her investigation of the perfect, MacLeod (2004: 296-297) noted that non-CVC and derived transitive verbs should not appear with a plain status marker in the inscriptions (see footnote 75 for preliminary objections), as certain stems take a –*V* suffix, in contrast to the previously assumed **–V_1w marker or the =**wa** / __# suffixation of root transitives (see Chapter 4.1.8 on the graphematics and linguistics). In addition to the two instances previously discussed in the literature (MacLeod 2004: 300), the sampling was able to enlarge the set and its lexeme diversity, although evidence remains scant (Figure 105). Omissions of =**wa** / __# do appear with a higher frequency among derived transitives; among 25 samples, 16 are classified as scheme 1.g.i, but a significance test fails with $k = 17$ with $\alpha = 0.95$ (for $p = 0.50$). The few occurrences of derived verbs in plain status and in primary position (see footnote 940 for an example) can thus only be explained by semantic and pragmatic considerations rather than morphological constraints[957] that deserve more research. At the same time, such review may also re-assign certain 1.g.i spellings from showcase 4TEMP to 2IND, or with some more probability vice versa. These would be superb cases to demonstrate that not only the orthography is decisive, but also a discourse analysis, as MacLeod (2004: 324) anticipated in her conclusions regarding the semantic dimension of the plain / perfect opposition.

A different approach, but still in support a verbal form, was conducted by Wald (2007: 329-341) by a terminological and thus typological point of view (cf. Nedyalkov and Yakhontov 1983). A "world in a grain of sand" (MacLeod 2004: 292), the infinite diversity in infinite combinations of linguistic discussion may indeed be unleashed by this showcase, rectifying the decision to first refer to it simply

[956] Taking again the example of Figure 175c, the preceding phrase with a passive expression refers to the placement of god effigies in temple sanctuaries, the secondary statement fronts the actor *K'inich K'an Joy Chitam* who has put in order the aforementioned gods. This description is also a neat example regarding the pragmatics of the perfect aspect that "conveys an enduring result of the action" (MacLeod 2004: 294): the placement was the factitive action of which the proper settling of the gods is the lasting result for Palenque's benefit. The preferred co-referential patient is only absent and replaced by the subject in a few instances (MacLeod 2004: 296, 301-305) in which case the anterior temporal deictic enclitic is affixed to the perfect.

[957] The mentioned example following a Calendar Round is only 'primary' at a first glimpse. The previous event, the arrival of the La Corona lord *K'inich Je Ok* at Calakmul is the telic action. The following perfect verb describes his perpetual proclamation as a *Kalomte'*. Except this conformity, the paragraph from CRN P. 1 is remarkable in a variety of ways: (1) the patient of the perfective verb is expressed, thus introducing a new information; (2) therefore, the syntactic and semantic agent of the previous verb is referred to; and (3) the two events are separated by a date and do not stand in an immediate relation.

as the 'temporal suffix'. But things become clearer when scrutinising these verbs. I posit an alternative view to Wald's (2004b: 230) consideration as a non-temporal resultative when taking the implications of these forms into account. Following the definition by Nedyalkov and Yakhontov, Wald considers these verbs as a state resulting from a previous action (the 'primary' verb), but the comparison between perfective and resultative forms (Wald 2007: fig. 140) indicates that resultatives are perfect participles (out of which the perfect aspect might have developed, see footnote 483), not a verbal aspect (also see footnote 487 for the comparison in TZO). A participle does not satisfy the semantic depth of secondary statements, as MacLeod (2004: 294) emphasised by the continuing relevance of the action[958]. I therefore still prefer a perfective aspect for the 'temporal' suffix, although a final say still cannot be uttered without a more thorough analysis.

Of lesser concern in this study are the non-verbal interpretations that mainly can be discarded abetting the verbal semantics. Some aspects necessarily had to be touched to demarcate the suffix function from competing models (see footnote 74) or different functions by the same **=ji** / __# suffixation pattern. The enclitic *=ij* as a neutral / future marker generally rare in hieroglyphic texts has to be excluded from the possibilities for a variety of reasons (cf. Wald 2000: 139-140, 2004b: 235-241), most importantly as (1) its temporal deixis does not match any discourse structure discussed here and (2) the linguistic evidence witnessing Wald's model does not feature transitive verbs with the enclitic[959]. The *–Vj* nominalisation ('nominalised antipassive') is also convincingly turned down by Wald (2007: 314, 369-373, 418-419). The showcases also provide support against such interpretation: nominalisations such as the instrumental or the verbal noun are not directly possible with transitive verbs, especially visible in the *–j-el* nominalisation (Figure 159i-j) of an antipassive (also Wald [2007: 378]), see footnote 441).

As a summary, the suffixation pattern both on a graphematic as well as a phonemic level are presented in Table 88. The vocalisation is largely in accordance with other *–V1C ~ –VC ~ –C* patterns among and conditioned by a verbal base and morphophonemic premises.

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[958] Some examples from the hieroglyphic already discussed support this view. Telicity might be involved, but that would be subject to another study. The ordering of the Palenque patron gods by *K'inich K'an Joy Chitam* (see footnote 948) was an action that resulted by their placing in the temple sanctuaries. A perfective "they have been ordered" is a completed action implying that they continue to do so, while a resultative "they were ordered" is a past description not indicating whether they were removed again before the account was written down. The continuing relevance is even more true for such verbs as *kab-a* or *il-a*. Their importance is less that an action has been supervised or witnessed once in the past as the event took place, but the resulting order of things emerging from it that became even more lasting when it was fixed in writing.

[959] However, Wald (2007: 647) cites the case of **u=chu-ku=ya** (Figure 167a) as a case of a root transitive carrying the temporal deictic enclitic. He does not take a nominal form into consideration (see footnote 939), also the fact that due to its secondary position, the verb must be inflected with the perfect aspect suffix, underspelled in this instance. He correctly notes that a possessed nominal form would inverse the captor / captive relationship in the inscription. A mismatching possessor / possessive connection is also applicable for the underspelled *u-pe[k-e]j-Ø* event in Figure 167b (see footnote 940), apart from other problems: if it were "the announcement of …", then the following *kal[-om]+te' y-uk[-n-om] ch'en* must be the stative agent, but a preposed title is typical only as a Yukatekan vernacular (Lacadena 2000b), and a possessor / possessive relation between the *kalomte'* title and *Yuknom Ch'en* II is neither indicated by an ergative pronoun, nor would it make any sense. Only a transitive verbs can bind both arguments.

Type	Transcribed Paradigm	Canonical Spelling
-PRF	u-CV$_1$C-V$_1$j-Ø	u=CV$_1$-CV$_1$=ji / u=CV$_1$C-CV$_1$=ji
CVC / ʔVC	u-CV$_1$C-[V$_1$]j-Ø	u=CV$_1$C=ji
VER.TR.R	u-CV$_1$[C]-[V$_1$]j-Ø	u=CV$_1$=ji
	y-V$_1$C-V$_1$j-Ø	yV$_1$=CV$_1$=ji
	y-V$_1$-C-V$_1$j-Ø=iy	yV$_1$=CV$_1$=ji=ya / yV$_1$=V$_1$-CV$_1$=ji=ya
	u-CV$_1$C-j-Ø=iy	u=CV$_1$-CV$_1$=ji=ya / u=CV$_1$C=ji=ya
	u-CV$_1$C[-j]-Ø=iy	u=CV$_1$-CV$_1$=ya
-PRF	u-CV$_1$C-Vj-Ø	u=CV$_1$-CV=ji / u=CV$_1$C-CV=ji / u=CV$_1$C=VJ
CVC / ʔVC	y-V$_1$(h)C-Vj-Ø	yV$_1$=CV=ji / yV$_1$=V$_1$C-CV=ji
VER.TR.D		yV$_1$=CV$_1$=V-ji / yV$_1$=V$_1$C=V-ji
	y-V$_1$C-V[j]-Ø	yV$_1$=CV / yV$_1$=CV=V / yV$_1$=V$_1$C=V
	u-CV$_1$C-[V]j-Ø	u=CV$_1$C=ji
	u-CV$_1$C[-Vj]-Ø	u=CV$_1$C
	y-V$_1$(h)C-[V]j-Ø	yV$_1$=V$_1$C=ji
	u-CV$_1$C-C$_d$-Vj-Ø	u=CV$_1$-CV$_1$=C$_d$V=ji / u=CV$_1$C=C$_d$V=ji
	u-CV$_1$C-C$_d$-V[j]-Ø	u=CV$_1$C^{CV_1}=C$_d$
	y-V$_1$C-C$_d$-Vj-Ø	yV$_1$=CV$_1$=C$_d$V=ji
	y-V$_1$C-Vj-Ø=iy	yV$_1$=CV$_1$=V-ji=ya / yV$_1$=V$_1$C-CV=ji=ya
	y-V$_1$C-[V]j-Ø=iy	yV$_1$=V$_1$C=ji=ya
	u-CV$_1$C-[V]j-Ø=ij=iy	u=CV$_1$C=ji=ji=ya
	y-V$_1$C-[V]j-Ø=ij=iy	yV$_1$=V$_1$C=ji=ji=ya
	u-CV$_1$C-j-Ø=iy	u=CV$_1$C=ji=ya
	u-CV$_1$C[-j]-Ø=iy	u=CV$_1$C=ya
-PRF (vernacular)	[u-]CaC-ej-Ø	Ca-Ce=je
CVC / ʔV(h)C	y-V$_1$(h)C-ej-Ø	yV$_1$=CV$_1$=je
VER.TR	y-V$_1$(h)C-[e]j-Ø	yV$_1$=V$_1$C=je

Table 88: Morphological paradigms and canonical spellings of perfect aspect verbs (C$_d$ = consonant of the intransitivising morpheme).

4.2 – Epigraphic Discussion Conclusions

WITH ALL THE EPIGRAPHIC EVIDENCE for each showcase brought forward and all possibilities discussed, their individual annotations can now be consolidated into generalised observations that may serve as a step towards a holistic understanding of the hieroglyphic orthography. I follow a heuristic approach in the most basic sense of Páppos of Alexandria: consider a problem solved by (1) seeking a backward approach by analysing it, and by (2) providing a forward proof by synthesising the steps[960]. Although I acknowledge that this method is rather simplified and we are

[960] The original theorem (Páppos Syn.: VII.1, 11-23) quotes in full as: <ἀνάλυσις τοίνυν ἐστὶν ὁδὸς ἀπὸ τοῦ ζητουμένου ὡς ὁμολογουμένου διὰ τῶν ἑξῆς ἀκολούθων ἐπί τι ὁμολογούμενον συνθέσει· ἐν μὲν γὰρ τῇ ἀναλύσει τὸ ζητούμενον ὡς γεγονὸς ὑποθέμενοι τὸ ἐξ οὗ τοῦτο συμβαίνει σκοπούμεθα καὶ πάλιν ἐκείνου τὸ προηγούμενον, ἕως ἂν οὕτως ἀναποδίζοντες καταντήσωμεν εἴς τι τῶν ἤδη γνωριζομένων ἢ τάξιν ἀρχῆς ἐχόντων· καὶ τὴν τοιαύτην ἔφοδον ἀνάλυσιν καλοῦμεν, οἷον ἀνάπαλιν λύσιν. ἐν δὲ τῇ συνθέσει ἐξ ὑποστροφῆς τὸ ἐν τῇ ἀναλύσει καταληφθὲν ὕστατον ὑποστη σάμενοι γεγονὸς ἤδη, καὶ ἑπόμενα τὰ ἐκεῖ προηγούμενα κατὰ φύσιν τάξαντες καὶ ἀλλήλοις ἐπισυνθέν τες, εἰς τέλος ἀφικνούμεθα τῆς τοῦ ζητουμένου κατασκευῆς· καὶ τοῦτο καλοῦμεν σύνθεσιν.> – "Analysis is now the road from what is desired as avowed through the following sequence to what is avowed by synthesis. This is to say, in analysis we assume the desired as avowed, and pass from this base, to what happens again before that, until by reverting we come upon what is already known, that covers the class of a first principle. We refer to this as analysis, quasi 'reduction backward'. In synthesis, by reversal we take as already done what was last arrived at in analysis, and by now setting in natural order the precedents, what before was following, and piecing them each other together, at the end we attain the construction of the desired. This we refer to as synthesis." (translation by the author).

still far away from deeming our understanding of Maya writing as solved, it shall nevertheless be an effectual epistemology for the present study.

The individual showcase discussions in Chapter 4.1 dealt more with specific orthographic patterns and individual spelling schemes. The intent of this concluding discussion is more to pursue the question what can be learnt from these observations, what the showcases can teach the epigrapher to help him understand the underlying mechanisms of the writing system. This brings us back to the question of descriptive and prescriptive grammars (Chapter 2.5.3.1). While the showcase discussions were primarily descriptive (as far as the epigraphy is concerned), the synthesis pre-empts prescriptive aspects in two senses. By formulating generalised principles based on the showcases, a limited applicability might be given for other grammatical forms as well. Secondly, the isolation of individual spelling patterns and graphotactics is able to provide an insight into an emic 'best practice' or 'orthographic canon' of writing, though still of fragmentary nature. In this sense, the synthesis, also in the second part dealing with linguistics (Chapter 4.3), very well fits the requirements of a "prospective" study in Göpferich's (2000) sense.

As an organic entity subject to change, innovation, and deprecation through time and space, Maya writing and the underlying Classic Mayan language (including vernaculars) have to feature fluctuations around a stable core of conventions in graphematics, lexicon, and grammar (see Chapters 2.5.3.2 and 2.5.4). To follow the path of synthesis, the concluding epigraphic discussion applies a reverse path. It first starts with a reflection on implications of how to analyse a glyph, with graphotactics and orthographic strategies and patterns that are easily discernible in the showcase discussions. With these insights, it is supposed to be easier to approach the core questions of the underlying mechanisms of harmony patterns and sign class attributions (see Chapter 1.2.1.2), specifically regarding debatable cases such as morphosyllables. A last question concerns the possible tracing of isographs and the distribution of the variations in the orthographic standard.

4.2.1 – Analytical Support

4.2.1.1 – Reading Order

The question of reading order is fundamental to retransfer a grapheme string into language. The basic 'left-to-right' and 'top-to-bottom' rule has long been known (cf. Zender [1999: 83-91] for a summary), while other graphotactic possibilities have recently been worked out (see Chapter 1.2.1.2). Deviations in certain representational rules required by sign features do not account, as they are inherent in a grapheme. But other disorder from this 'standard', likewise known awhile, mostly does not imply alternative readings, but is determined by other reasons, such as aesthetics (cf. Houston 1988: 129). By observing the grapheme-internal variability of the **AJAW** superfix, Lounsbury (1973: 134) provided the most compelling explanation: that arbitrariness of the reading order is the result of a conventionalisation of spellings[961]. As the purpose of each grapheme is usually determinable in a glyph, the transliteration in this study habitually neglects the graphemic order and provides the intended order for the transliteration.

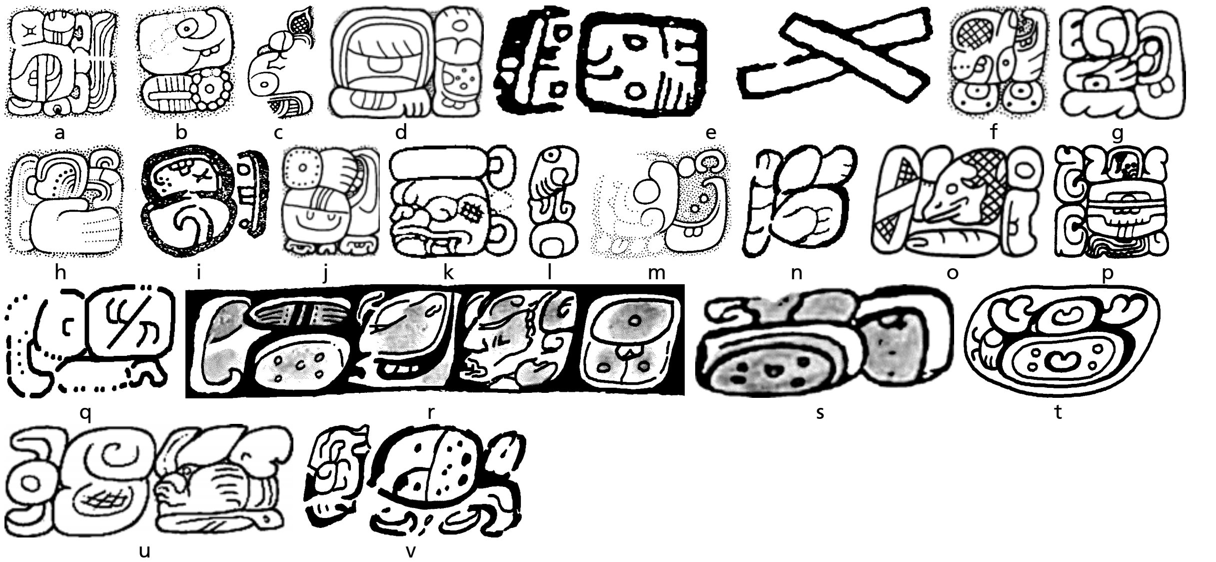


Figure 176: Sign transpositions in a glyph block, given in their block-internal reading order. **a) AJAW-wa-ya-ni** (PAL TI-W, H2), **b) a-AK'-ja-ta** (YAX Lnt. 52, B2), **c) CHICH-hi-chi-li** (TRT Mon. 6, E1), **d) IL-ji-a** (TRT Bx. 1, D2), **e) u-le-JEL** (C Ma. 21c), **f) k'a-ja-la** (XCA Pil. 1, B1), **g) HUN-K'AL-na-ja** (PAL PMI1, C1), **h) u-TUN-wa-K'AL** (UXB Msc. 1, A1), **i) ku-mu-u** (C Ma. 109b), **j) PAT-i-ja-na** (PAL TABL, L2), **k) OCH-bi-ya** (QRG Zoo. G, Y2), **l) PUK-K'AK'-yi** (NMP St. 15, D3a), **m) SIH-ji-ya-ja** (PST St. 1, D4), **n) le-TE'** (COL K1560, E1), **o) ta-tzi-le-TE'** (COL K3844, F1), **p) K'AK'-TIL-CHAN-wi** (QRG St. A, D6), **q) u-bu-TZ'AK-ji** (TRS St. 1, E1), **r) u-tz'i-bi-ja-na-la** (COL K5838, D1-F1), **s) yu-bi-k'i** (COL K3059, E1), **t) k'i-yu-bi** (COL K1446, A1), **u) yu-lu-xu-li** (HNY Bx. 1, 4-5), **v) u-WAY-ya-wa** (COL K771, M2).

Taxonomically, such sign transpositions within a block are difficult to assess. For Egyptian writing, Lacau (1903) introduced the term "apparent metatheses", as they are simply existent in writing only, hence "graphematic metathesis" might as well be applicable. For Maya writing, Zender (1999: 88) minimally applied "graphic transposition". There is also one important difference to an anagram: the shuffling was not purposefully done for a cryptogram or as a word play, as among alphabetic scripts (and questioning whether anagrams are possible at all in non-alphabetical writing system). The sum of all graphemes in a block (Figure 176) nevertheless provides the knowledgeable reader (thus not necessarily the epigrapher) with the phonemics and morphology of the underlying expression. Within defined morphemic borders, the totality of signs can be perceived as an informational block. Contextual

[961] Lounsbury provides some examples from cuneiform writing to support his case, also see the examples from Egyptian writing in Figure 177. What Lounsbury suspected can fully be confirmed by the statistical investigation of the showcases in this study. Certain morphemes are distinguished by often different graphemes in writing, reaching a high proportion of conventionalisation. A good example is the switch between =**ji-ya** ~ =**ya-ji** for the *=iy* enclitic after a (syncopated) *–(V)j-Ø=iy* morpheme string among the passive thematic (e.g. compare Figure 62e with 62n), inchoative (e.g. compare Figure 74c and 74d), or perfect (see Figures 166 and 172) suffix. But the grapheme reversal between 33F **ji** and 32M **ya** is not overly common, though. Only 19 cases of **ya-ji** face a majority of 167 samples (89.79%) with the regular **ji-ya** sequence. Other explanations for sign transpositions, such as dyslexia (Kelley 1976: 15-16) or diglossia (cf. Houston 1988: 129) rather do not account, or only in isolated cases, otherwise a majority of the Classic scribes would have been inept or Maya writing would be a lawless and anarchic writing system.

information provide additional clues of how to mentally re-arrange the graphemes into a meaningful reading (also see the discussion about the mental lexicon in Chapter 4.2.2.2).

A seemingly shuffled reading order is the regular result of complex representational rules, such as conflation (Figure 176b) or superimposition (Figure 176g-h, j), where signs may randomly appear as a superfix, subfix, or infix. It is also not uncommon with the simultaneous appearance of full phonemic complementation (Figure 176c, v, similar to the cases in Figure 177c-d), in nominal phrases (Figure 176p), or formulaic expressions such as a dedicatory statement (Figure 176n-o, r-t). Apart from many other writing systems, sign transpositions for graphematic reasons[962] are also known from Egyptian writing (Figure 177), see Lacau (1903) for the first systematic description.

This is partly due to aesthetic reasons to better fit signs into a 'block' (Figure 177a-d), and thus either a convention or an individual decision, but also the rule to put honorific words (such as 'majesty', 'god' and god names) in first position (Figure 177e-g) as a sign of reverence (cf. Gardiner 1957: §§ 56-57). The way to order or group signs may also depend on the time of writing (Sethe 1908-10, I: vii). No such details have yet thoroughly been investigated in Maya writing.

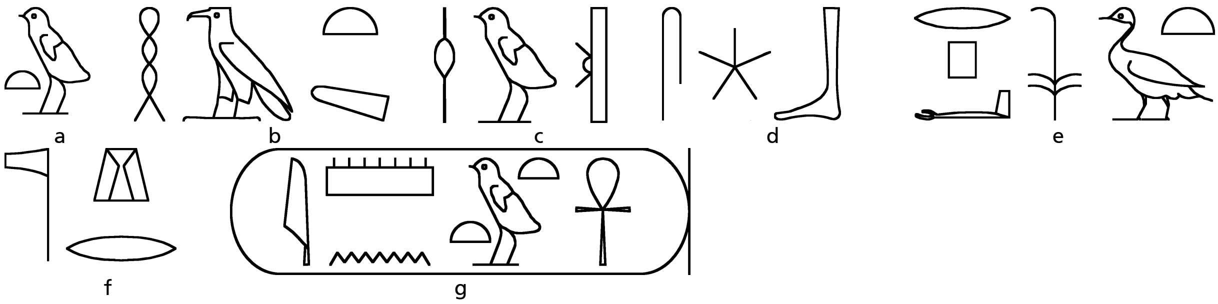


Figure 177: Sign transpositions and groupings in Egyptian writing. Sven Gronemeyer, after examples taken from Erman and Grapow (1926-63) and Lacau (1903). **a)** *.wt* (as <*tw*>, "-3PL.FEM"), **b)** *ꜣḥ.t* (as <*ḥꜣt*>, "field"), **c)** *wḏ* (as <*wḏ-w*>, "to command"), **d)** *sbꜣ* (as <*s-sbꜣ-b*>, "star"), **e)** *rpꜥ.t-zꜣ-nsw.t* (as <*rpꜥ-sw-zꜣ-t*>, "crown prince"), **f)** *ẖr-nṯr* (as <*nṯr-ẖr-r*>, "necropolis"), **g)** *twt ꜥnḫ ꞽImn* (as <*ꞽImn twt ꜥnḫ*>, "Tutankhamun").

As in Egyptian writing (cf. Gardiner 1957: § 56, 63), sign omissions (see footnote 584) or transpositions sometimes nevertheless cause difficulties for the epigrapher. The question relevant to the study objective is how spelling schemes and suffixation patterns can help to determine the correct order of transliteration and even more the right transcription and morphological analysis. The correct reading is one key of how to discern suffix functions (as already sketched in Chapter 2.2.2.5), but not without considering the syntagma and context. The workflow of a source immanent analysis (Figure 10) is always only as good as the current state of research. But a deepening understanding of the graphematics and grammar of Classic Mayan will provide more mutually exclusive constraints to eliminate questionable cases as impossible or at least as doubtful.

[962] As an example in an alphabetic writing system, consider the calligraphic sign arrangements of the Chi Ro christogram (which by itself is a ligature of <XP>) in Hiberno-Saxon gospels like see Book of Kells (cf. Lewis 1980) as variations of a lowercase <χρι>. For Chinese, refer to Chiang (1973: 181) for examples.

This ideally leaves no alternatives, if not, possibilities may remain with a gradual degree of certainty (e.g. the case of *te'-el* as either 1POSS or 1ATTR, see footnote 732). Some ambiguities were possibly also intentionally designed by the scribe (e.g. a passive versus an inchoative compound, see footnote 698). The conundrum of the 'intransitive compound' (Chapter 4.1.14) is a case where a broad comparative examination of substitutions and syntax provides a resolution[963] of how to morphologically consider a sign in a glyph block. Likewise, another example is a deeper understanding of the morphophonemics of certain suffixes in connection with the allomorphs of the temporal deictic enclitic (Chapters 4.1.1, 4.1.3, and 4.1.19) that clarifies on the grapheme function either as a complement or an indicator for a morpheme[964]. Certain spellings, not least because of their graphotactics, remain ambiguous even after the analysis and discussion[965] and may withstand a decisive solution.

4.2.1.2 – Decipherment Aids

The question of reading aids in Maya hieroglyphic writing is here more to the point of how to support the epigrapher to determine the lexical class, semantics or grammatical form of a glyphic expression. How can these factors help in the epigraphic analysis and decipherment process? As such, the process of assigning a lexeme to a certain lexical class and semantic domain by context and affixation patterns and thus identifying a corresponding lexical entry in dictionaries is also tied to the methodol-

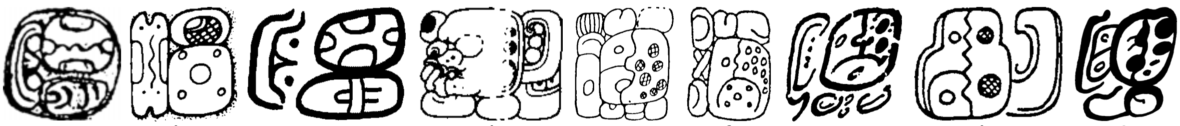
[963] As such, the transposed **OCH-bi-ya** spelling (Figure 176i) can only be transliterated as **OCH=ya bi** < *och-Ø=iy (ti) bi[h]*, as there is (1) no reason to consider an underspelling of **=ji** for an inchoative, that (2) **=ya** might indicate the versive of a compound due to the narrative structure requiring an enclitic, and (3) the syntagma with the following *u-sak-bak-ik'[i]l* as the agent makes a nominal compound impossible without an ergative pronoun. If viewed isolated, a similar example would be **OCH-chi=ya** from TNA P. Emiliano Zapata, Bp2 (Mayer 1995: pl. 250), although it does not feature sign transpositions. The spelling with **=ya** could suggest a vernacular ECh ***och-iy-Ø* form of intransitives (see Chapter 4.1.13), which already seems doubtful considering a Tonina provenance. The context identifies the verb to follow a Distance Number, thus it can only refer to an anterior event, so we have to analyse *och-Ø=iy* with the temporal deictic enclitic.

[964] Consider the case of **OCH-bi-ji-ji-ya** (Figure 78k) discussed in Chapter 4.1.14, where the grapheme set and block arrangement most certainly points towards **OCH=BIH=ji=ji=ya** < *och-Ø+bih-[a]j-Ø=ij=iy*. Also, the case of **SIH-ji-ya-ja** (Figure 176k) can only segment as **SIH=ja=ji=ya**, as ****SIH-ya=ja=ji** would imply ***siy-aj-Ø=ij*, and the calendrical structure requires an anterior *=iy* deictic enclitic (also compare to the reading order in the substitution in Figure 75i). However, a discussion still can be raised whether the transcription yields *sih-j-Ø=ij=iy* or *si[y]-[a]j-Ø=ij=iy* (see footnote 672), although the first alternative is more likely in comparison with other block arrangements, when the two spirants phonetically assimilate. Although a reading of the 'Star War' expression is still pending (see footnote 851), it can also serve as an example of how its graphotactics in connection with the affixation pattern explains the 'Earth Star' and 'Shell Star' variants (see footnote 812) in terms of the verbal morphology. At same time, it vindicates the function of the **yi** sign not as a phonemic complement, but as a mediopassive suffix.

[965] Several cases are concerned with the hand sign MZS **CHOK** (see footnote 315). Besides the question whether the droplets indeed represent a separate grapheme **CH'AJ** in a conflated spelling, the graphematic affixation patterns may point out several alternatives. These have to be judged based on the provenance and the context, and at least for the data base compilation, an agreement on the most plausible option had to be made. Ambiguities may also be given where one syllabogram fulfils a double function, as Zender (1999: 123-127, figs. 45-46) exemplified by signs stretching across the signs to which they apply. A case such as **AJ (CHAN=CH'EN)**$^{\mathbf{na}}$ (PAL SLAV, F2b) where **na** complements both **CHAN** and **CH'EN** as the common subfix is an obvious case, but the case of **u=(to-k'a=pa-ka-la)** (e.g. YAX Lnt. 46, F8) is less obvious. A substitution such as **u=to-k'a u=pa-ka-la** (e.g. YAX Lnt. 45, C6) indicates that the second noun in the phrase is also inflected with the 3SG.ERG. But unlike Zender, I would not generalise such cases, not even within a single site. It is possible that *u-tok' u-pakal* and *u-tok'+pakal* are equal substitutions, or such an alternative has a temporal or regional preferability, and charting all graphemic instances might elucidate the question.

ogy of the source immanent analysis (Chapter 2.2.2.5). The actual principles of spelling patterns applied as the autochthonous intent of a reading aid are discussed in Chapter 4.2.2.

There are several instances among the samples (Figure 178), where affixation patterns can be utilised to identify several homographic lexemes with polysemy in distinct lexical classes (allowing allographic substitutions, compare Figure 178b with 58e). Of course, homography is not necessarily the result of homophony, although it is implied (while otherwise heterography is sometimes involved, see footnote 24 for the case of *ik'* versus *i[h]k'*).



a b c d e f g h i

Figure 178: Homographic lexemes of different lexical classes. **a) u=BAK=le** < NOUN *bak*, "bone" (EKB Msc. 7, C1), **b) BAK=li=bi** < INSTR<POS *bak*, "joint" (TRT Mon. 6, K10), **b) u=BAK^{ki}** < NOUN *bak*, "captive" (COL K2206, W1), **d) BAK=wa=ja** < VER.TR<NOUN *bak-V*, "to capture" (TIK T. 4 Lnt. 2, B10), **e) ti ^{wa}WAY^{ya}** < NOUN<VER.INTR *way*, "to sleep" (YAX St. 12, F1), **f) u=^{wa}WAY=bi** < INSTR<VER.INTR *way*, "to sleep" (CPN T. 22 Stone, D1), **g) u=WAY^{ya}** < NOUN *way*, "co-essence" (COL K1253, B2), **h) WAY=ja** < INCH<NOUN *way*, "co-essence" (COL Msc. Covarrubias, A1), **i) u=WAY=wa=la** < NOUN<VER.TR<NOUN *way-a*, "to transform" (TIK K3395, Y'2).

With *bak*, four related lexemes can be determined: (1) as "bone" for the anatomical body parts (Figure 178a) with (2) their connection in the human skeleton reflected in the positional root (see footnote 902) "joint" (Figure 178b) as an example for an intrinsic, embodied anchor in a frame of reference (cf. Hanks 1990: 90-91, fig. 3.1); and (3) as an allegory for "captive" (cf. Stuart 1985a: 98) with (4) a corresponding derived transitive "to capture", literally "to bone" (Figure 178c-d). For *way*, there are several related lexemes and lexicalised derivations concluded by the morphosyntax: (1) the intransitive "to sleep" that may appear as a verbal noun "sleeping" (Figure 178e) or instrumental "sleeping place" (Figure 178f); (2) the noun "co-essence" (Figure 178g) for an animate 'spirit' appearing in sleep and associated with darkness, underworld, and the *k'áax* wilderness (cf. Houston and Stuart 1989: 1-2, Klingler 2008, Klingler and Letcher Lazo 2012) with its inchoative "to become a *way*" (Figure 178g); and (3) a derived transitive (see footnote 735) "to transform" (Figure 178i) that describes the active act of turning into a *way* being.

The examples demonstrate that the morphology and contextual embedding in a process of elimination can also explain hitherto unrecognised forms, such as *bak-l-ib*, *way-aj*, and *way-w-al*. But this requires a developing understanding of the underlying grammar of at least the GLL languages. Even with it, some cases may remain dubious also because of the high productivity of Mayan languages with homophonous suffixes[966]. We must nevertheless accept that despite a reading of all graphemes in a

[966] Ambiguities are not only an issue of a deficient understanding of the graphotactics, but also the linguistics, even though a deep orthography might contribute to the problem. We can certainly reconstruct several 'roads to Rome' that are morphologically valid. The question is to which register each of them belonged in ClM, whether it was usual or formal style or considered an awkward utterance. This of course is also a question of sociolinguistics and might further be subject to regional or temporal change. Nevertheless, even if the morphology is different, the semantics and content does not overly change. Consider the discussion about the analysis of *u-tz'i[h]b-al* in

block, clear graphotactics, and an understanding of the suffixation patterns, some expressions may remain ambiguous or can likely never morphologically and linguistically be analysed[967].

4.2.2 – Orthographic Strategies

The previous chapter is more a low-level introduction to the real key question investigated in this thesis: the orthographic strategies at morphemic boundaries and in the suffix domain. And while the review previously opposes problematic cases, this chapter pursues a positivistic evaluation: what a meticulous analysis and discussion of several grammatical showcases can contribute to the understanding of the autochthonous normativity and prescriptivity in hieroglyphic writing and possibly why such practices were applied.

Two foci are laid: (1) the apparent emanation what actually appears graphematically, and (2) the actual reasoning, as far as deducible and reconstructable. Of course, such summarising review based on the analytical workflow is basically dimensionless and considers the writing system as a whole; temporal and regional variability is neglected. Likewise, the underlying principles might appear more diverse when applying a multivariate review, but phenomena as changes in the graphemic lexicon are more difficult to assess.

4.2.2.1 – Ostensible Emanations

The statistical analyses and the discussion of individual patterns among the showcases provide one fundamental conclusion regarding the hieroglyphic orthography: the suffix domain tends to standardise spellings, while the root domain adapts its spellings to the necessities of the suffixes. As a general rule, the script, supported by its syllabic **CV** structure, applies a forward left-to-right syllabogram

footnote 83. If derived from the noun *tz'i[h]b*, usually spelled **tz'i-bi**, we face a spelling change to integrate the –*Vl* abstractive suffix. If it derives from the verbal *tz'i[h]b-a*, usually spelled **tz'i-ba**, any –*Vl* nominaliser would get assimilated with the –*a* factive suffix, as demonstrated for the antipassive and perfect suffixes (Chapters 3.1.3.2 and 3.1.7). Again, the insecurity of the epigrapher regarding the nature of the –*Vl* suffix and the orthography comes into play, and the uncertainty is basically a product of the state of research. Possibly, an analysis of the appliance of **=la** versus **=li** might reveal a distinction in the future. Refer to K578 with **u=tz'i-ba=li** in A3-A4 and **u=tz'i-ba** in B1, where the latter could be taken as an underspelling of the nominal form. But with good confidence it rather represents the verbal form within a phrase to translate as "he painted his drinking vessel for fresh (cacao)", especially if one compares to **u=bi-ba ti yu=k'i=bi** < *u-[tz'ih]b-a-Ø ti y-uk'-ib* (K595, D1-H1, with **tz'i** misspelled as **bi**) as "he wrote it onto his drinking vessel." A similar uncertainty applies to the case of XGK as **MUY** and spellings with **MUY(-ya)=lV** < *muy-al* (e.g. ZAP St. 5, D9). The **lV** syllabogram most likely indicates an abstract collective of a nominal *muy*, "ascend, climb, rise" (cf. Gronemeyer 2006b: 28) as the etymology for "cloud". But as *muy* also has a corresponding adjective (see the spellings of **MUY**[yi] e.g. on TRT Bx. 1, J1), certain spellings may also spell an attributive *muy-[V]l* deviating from the standard harmonic suffixation pattern (see Figure 94), especially when in a potential vernacular context.

[967] Such desiderata concern not only case-by-case examples depending on the context (e.g. the case of *el naah*, see Figure 78c and footnote 712). In case the lexical class is dubious (e.g. with *woj*, see footnote 927), a fitting lexeme is not attested in dictionaries (e.g. with *chul*, see footnote 822), or a combination of the two, a proper morphological analysis may be impossible (e.g. with *tzul*, see footnote 102), although the semantic role is clear.

adaptation/alteration for full phonemic spellings, and thus has to discard any disharmony rule in such environments, a special aspect discussed more extensively in Chapter 4.2.3.

I will first dwell on the suffix domain before turning to the root spellings. There is little doubt that different graphemes with a syllabic **CV** structure (leaving possible polyvalency apart for the morphosyllable discussion in Chapter 4.2.5.3) are generally, though not exclusively, applied to graphematically indicate a specific suffix function (Table 73). Such homogeneity is only applicable to a certain degree (see section 2 of Chapter 3.4.2.) when considering semi-constant, harmonic and semi-harmonic patterns among some showcases. Also, a varying degree of liberty to vary is demonstrated alongside the statistically significant 'common practice'. Certain diachronic aspects of variability in the suffixation patterns are detailed in Chapters 4.2.3.3 and 4.2.4, while a basic regional diversification is pursued in Chapter 4.2.6 (Figure 197).

The common appliance of a specific grapheme to indicate the suffix function is also curtailed by a maximum of five different **CV** graphemes for each suffix consonant, determined by the amount of vowels reproduced in the graphemic lexicon. If ClM had a six-vowel system where [ə] was not only considered as an allophone of [a], it was not distinguished (see footnotes 169, 734, 921, and 940) by separate **Cä** graphemes (although Wichmann [2002b] similarly attempted to provide proof by vowel length distinction). Taking the occasional suffixation by certain **ʔVC** morphographs as a deviating pattern apart, the grapheme inventory is theoretically insufficient to ensure a one-to-one relation. Indeed, certain suffixation patterns are recurrent across several functions, as best demonstrated for =**ja** / __# < *–aj* among showcases 1PASS, 1MED, 1INCH, and 1ABSL; but also partially by =**wa** / __# among 2IND $-V_1 \sim -V$ and 2ANTIP $-V_1w$.

But still, the grid of **CV** signs is not completely exhausted, except along (semi-)harmonic suffixation patterns such as for showcases 1ABSL and partly 3NMLS, where the root vowel dictates the suffix grapheme. Although Table 73 is a mere snapshot of the suffix inventory of ClM, =**Ca** / =**Ci** __# patterns are prevalent (not only in the suffix domain), a preference already noted by other authors (cf. Houston, Robertson and Stuart 2001b: 15, Lacadena and Wichmann 2004: 131-132); and here enhanced by the addition of a less distinct =**Ce** / __# pattern among 1POSS, 2COM, and as a sub-pattern within 4TEMP (see footnote 940). The implications are manifold and have sparked several theories, such as morphosyllables (Houston, Robertson and Stuart 2001b) or the affixation conventionalisation hypothesis (Mora-Marín 2003a, 2004a, 2010a); none of which being widely accepted. Only in a few cases does the grapheme vowel indeed have a morphological function and is not mute, e.g. along showcase 2MED to spell out the *–i* completive marker.

Two ideas deserve a more thorough discussion. The epiphenomenon of preferred mute vowels is reviewed below, while the question of morphosyllables is the main subject of Chapter 4.2.5.3. The 'affixation conventionalisation hypothesis' is reassessed here, as it is directly tied to graphotactics. Section 3a of Chapter 3.2.2 tentatively concludes that the idea of disharmonic spellings as conventionalised underspellings is burdened with graphematic and linguistic problems, while section 2c of Chapter 3.4.2 found no general statistical support for the hypothesis. As pointed out, a meticulous context analysis and the syntactic embedding is necessary to identify an underspelling, such task has exemplary been executed for the instrumentals *a[h]n-ab* and *uk'-ib* (see footnotes 912 and 913). These indicate that a morpheme is indeed spelled out when required in certain environments, while there is no evidence for a regular underspelling. Especially case 2MED questions the affixation conventionalisation model, as no *–iC* morpheme can be indicated by the mediopassive –V_1*y-Ø-i* morphology, unless one assumes the regular appliance of the *=iy* enclitic, which again is not supported by spelling patterns that indicate a suffix vowel syncope (see below).

In the light of the analyses, there is little doubt that certain **CV** graphemes indeed function as supragraphematic 'visual reading aids', as advocated by Tokovinine and Davletshin (2001). It becomes clear that the actual phonemic value of the grapheme is of importance, not a specific allograph that might further differentiate the underlying morphology (see below). Hence, 'phonemic reading aid' might be an even apter terminology, as the reader correlates a set of graphemes with a single **CV** syllable. Such phonemic component also directly interferes with the question of harmony patterns (see Chapter 4.2.3.2). But in fact, leaving the distinction between regular and head variants as well as stylistic variations apart, only few syllabograms actually have true allographs (see footnote 582), as for example **ji** with APC, 1M1, and 33F.

As a 'reading aid', the standard graphematic indicator was not always applied by the scribes. This explains the spelling diversity noted by parameter *H'* in Table 73. In this context, not only infrequent abbreviatory underspellings are of interest, but even more the rare appliance of morphographs in the suffix domain in scheme 1.e.iv in relation to morphosyllables. Even when deviating from the standard, the scribes were on the safe side to indicate a grammatical form and its phonemics to a certain degree. This is even more true for an ancient knowledgeable reader. The liberty to vary is inherent in the writing system without necessarily withholding linguistic information or writing a *per se* deceptive spelling, unless ambiguity was desired e.g. in vernacular contexts (see Chapter 4.3.4.1 and Figure 203).

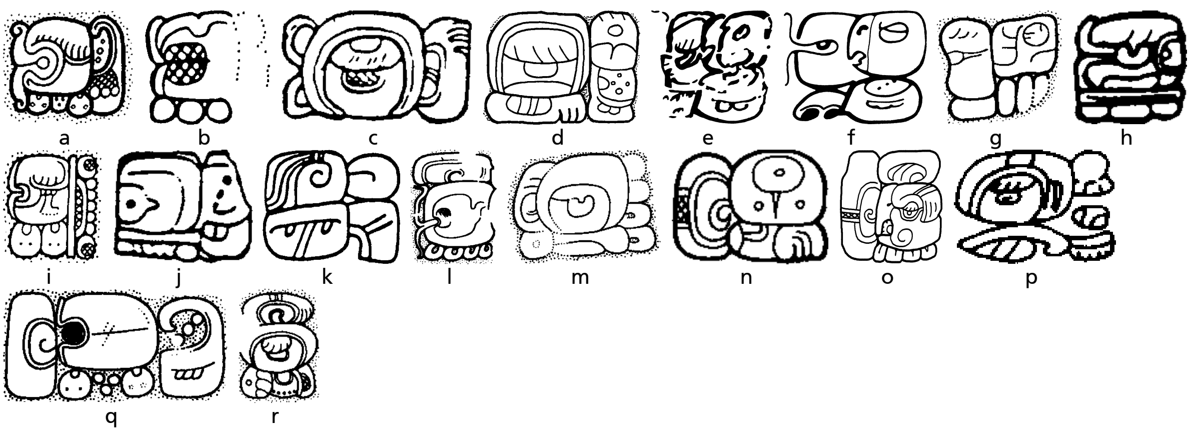


Figure 179: Spelling variations among *il-a* with the showcase suffix / __#, a-j: 1PASS, k: 2IND, l-r: 4TEMP. **a)** **IL-la=ja** (CNC P. 1, O5), **b)** **IL-la=ji** (QRG Alt. L, G2), **c)** **IL=ji** (CPN St. 6, D1), **d)** **IL=a-ji** (TRT Bx. 1, D2), **e)** **IL**^{la}**=a-ja** (NTN Dwg. 70, B1), **f)** **IL**^{li}**=a-ja** (NTN Dwg. 66, B1), **g)** **IL**^{li}**=a-ji** (TRT Mon. 1, B4b), **h)** **IL=AJ** (CRC St. 19, L4), **i)** **IL**^{la}**=AJ** (SBL St. 10, B7), **j)** **IL=AJ**^{ja} (CRC C4B 37-8), **k)** **yi=li=wa** (CHN T4L-L2, D2), **l)** **yi=IL=ji** (DPL P. 19, F1a), **m)** **yi=IL**^{li}**=ji** (UXL St. 12, B7), **n)** **yi=la=ji** (PNG P. 3, J1), **o)** **yi=li=a-ji** (PAL TI-M, C3), **p)** **yi=IL=a-ji** (CRC St. 6, B20), **q)** **yi=IL-la=ja** (UAX St. 13, A4), **r)** **yi=IL=a** (CRC St. 3, C12a).

But if there are strategies intended for a unified orthography, then it is even more surprising to find some apparent spelling difficulties throughout. It is more an observational inference rather than a solid quantification. Several characteristics can be determined (Figure 179). Most of the constant suffixation patterns with a specific =**CV** / __# grapheme feature a relatively low diversity of variations (Table 73), while it increases among those that allow different graphemes (see Figure 198 for a tracing of case 2ANTIP). A more loose orthography is also observable with certain irregular verbs, especially *il-a* (Figure 179) that e.g. regularly spells its passive by =**ji** / __#; and among some verbs with the *=ij=iy* temporal deictic enclitic (Figure 180).

However, such cases are rather restricted, and other non-CVC verbs such as *at-i*, *it-a*, *kab-a*, or *tz'i[h]b-a* are less often deviant, also further derivations of the passive of derived transitive verbs (see Figure 61). If the reconstruction of allomorphs triggering morphophonemic processes is true, then the uncommon choice to use *=ij=iy* might occasionally have 'overstrained' (less skilled?) scribes. We often find such spellings where the grapheme for the root-immediate suffix is not altered for integration, but is written as it were / __#. Hence we e.g. find **K'AL-la=ja=ji=ya** < *k'a<Ø>l-aj-Ø=[i]j=iy* (Figure 180f) or **SIH=ja=ji=ya** < *si[y]-j-Ø=[i]j=iy* (Figure 180j) instead of the more straightforward ****K'AL-la=ji=ji=ya** or ****SIH=ji=ji=ya** that applies the left-to-right syllabogram vowel carry over to the following morpheme.

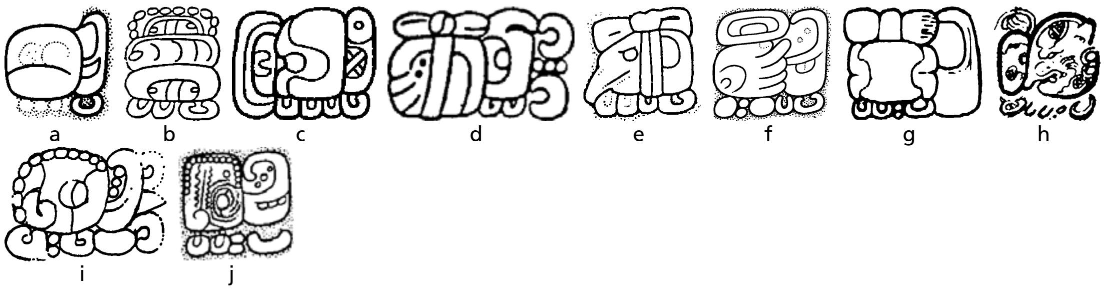


Figure 180: Spelling variations among verbs with ~ *=ij=iy*. **a) CHUM[mu]=ja=ji=ji=ya** (TNA Mon. 111, O1), **b) HUL-le=li=ji=ya** (CPN Alt. F', A3b), **c) yi=IL=ji=ji=ya** (PNG Alt. 1, F2), **d) [jo]JOY=ji=ji=ya** (CPN Alt. F', B3a), **e) JOY=ja=ji=ya** (CLK St. 33, G2), **f) K'AL-la=ja=ji=ya** (TNA Frg. 37, Ap2), **g) ma-AK=ja=ji=ya** (PNG St. 8, B19), **h) u=KAB=ji=ji=ya** (PAL T21B-P, H7), **i) SIH-ya=ja=ji=ya** (ALC St. 1, B5), **j) SIH=ja=ji=ya** (IXZ P. 1 VIII, pA1b).

Some debate can be loosened of how stable the orthographic principle of a preferred pattern was despite the obvious allowance of variability. Ideally, a review as in Table 73 would also be necessary to track diachronic developments. Otherwise, / __# suffixation variations within a region or site could simply reflect orthographic styles of an individual scribe or a scribal school[968]. More difficult are instances were alternating patterns appear on the same monument.

Such cases are extremely rare in comparison to the overall sample set. Many feature simple underspellings (Figure 181), mostly of the standard pattern, while changes between different syllabograms

[968] Note the prevalence of the antipassive =**wi** / CaC__# in Quirigua and also a tendency to use this pattern in Naranjo. We can also observe a trend to use =**wi** for root transitive verbs in Naranjo, especially in Early Classic times. Another example is the tendency to underspell the suffixes in the Usumacinta area, especially notable in Late Classic Yaxchilan.

or with morphographs are even more scarce (Figure 182). Of course, several scribes could have worked on one monument / text, which a palaeographic investigation might elucidate[969]. Orthographic deviations on a single monument may thus very well reflect individual renditions and understandings of conventions. It is mere speculation, but some scribes might specifically have altered their pattern to create a difference to other scribe's work and preserve some personal fingerprint in a collective work – showing that sometimes many cooks can spice up the broth – while others irrevocably complied with the standard. We also find texts where one pattern was correctly applied in first instance and then consistently perpetuated among other forms, even though it then deviates. Further studies may provide figures of a significant correlation between pattern deviations and palaeographic results.

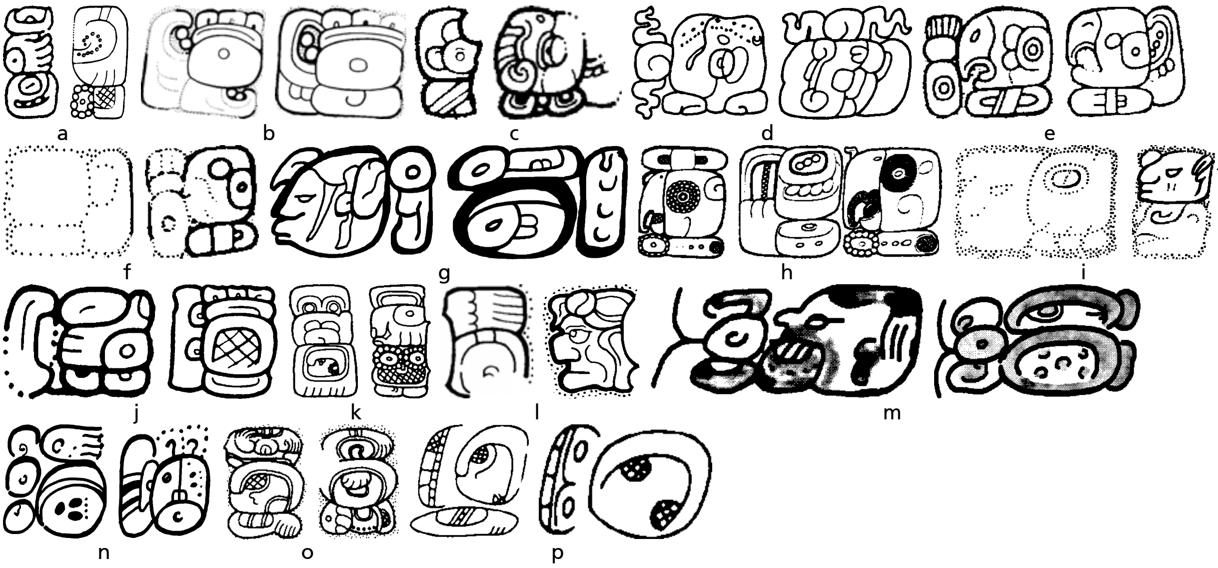


Figure 181: Suffixation pattern variability on the same monument with underspellings, a-b: 1PASS, c-f: 1INCH, g: 1POSS, h-i: 1ATTR, j-k: 2IND, l: 2MED, m-n: 3INSTR, o-p: 4TEMP. **a)** ITN St. 17 – 9.17 (F12a: **K'AL=ja**, K2a: **jo-ch'a), b)** NAR Alt. 2 – 9.17 (B2: **ja-tz'a=ja**, C4: **ja-tz'a), c)** DPL St. 14 – 9.14 (F1a: **AK'-ta**, H1: **SIH-ya=ja), d)** TIK Marcador – 8.19 (A8: **SIH K'AK'**, D4: **SIH=ja K'AK'), e)** YAX Lnt. 2 – 9.16 (F1: **ti ^{a}AK'-ta**, K1: **^{a}AK'-ta=ja), f)** YAX Lnt. 6 – 9.16 (A3: **AK'-ta=ja**, B2: **ti AK'-ta), g)** MTL K1004 – 9.15 (J1: **IXIM TE'**, M1: **TE'=le), h)** MQL Str. 4 – 10.0 (F,1b: **ta MO'^{o}**, V,2-3: **ta-ja=la MO'^{o}), i)** YAX Lnt. 28 – 9.16 (Q1: **IX k'a-ba=la**, X2a: **IX k'a-ba), j)** NMP St. 2 – 9.15 (A2: **u= CH'AM=wa**, D4: **u=tz'a-pa), k)** QRG St. E – 9.17 (C20a: **u=bu-t'u**, D19a: **u=CHOK=wa), l)** BPK ScS. 4 – 9.9 (B7b: **K'A'=yi**, C5: **T'AB), m)** ALH K2993 – n/a (E1: **yu=UK'**, M1: **yu=k'i=bi), n)** COL K2358 – n/a (E1: **yu=k'i=bi**, P1: **CHAK to WAY), o)** CRC St. 3 – 9.10 (A20b: **u=KAB=ji**, C12a: **yi=IL=a), p)** NAR Alt. 1 – 9.8 (G1: **u=KAB=ji**, I2: **u=KAB**).

[969] Best known is Zimmermann's (1956: 11-12, pl. 5) identification of individual handwriting in the Dresden Codex. In his investigation of several inscriptions from Palenque, Van Stone for example noted a carving style of four different hands on the Tablet of the Slaves (Van Stone 2005: 185-202). It is composed of three limestone slabs, where one individual each was dealing with the left and right part alone. As Van Stone (2005: 358) concludes his study, the Palenque scribes were, even under the supervision of 'head artists' – "[…] expert, seasoned carvers, with habits and opinions of their own […] to put specific words in specific spaces – but not necessarily specific spellings of those words." Furthermore (2005: 360), the scribes and sculptors "[…] did not work on continuous texts. Many clauses are begun by one Hand and continued by another, sometimes to be concluded by a third." Of course, the study restricts itself to one site and monuments from a specific time period after the reign of *K'inich Kan Bahlam* II. Montgomery's (1995) study of the inscriptions produced during the reign of Piedras Negras Ruler 7 is less detailed than Van Stone's on Palenque, but similarly concludes that a team headed by a master artisan was working on one monument. Hence, together with the evidence from the Dresden Codex, a similar workflow can generally be assumed.

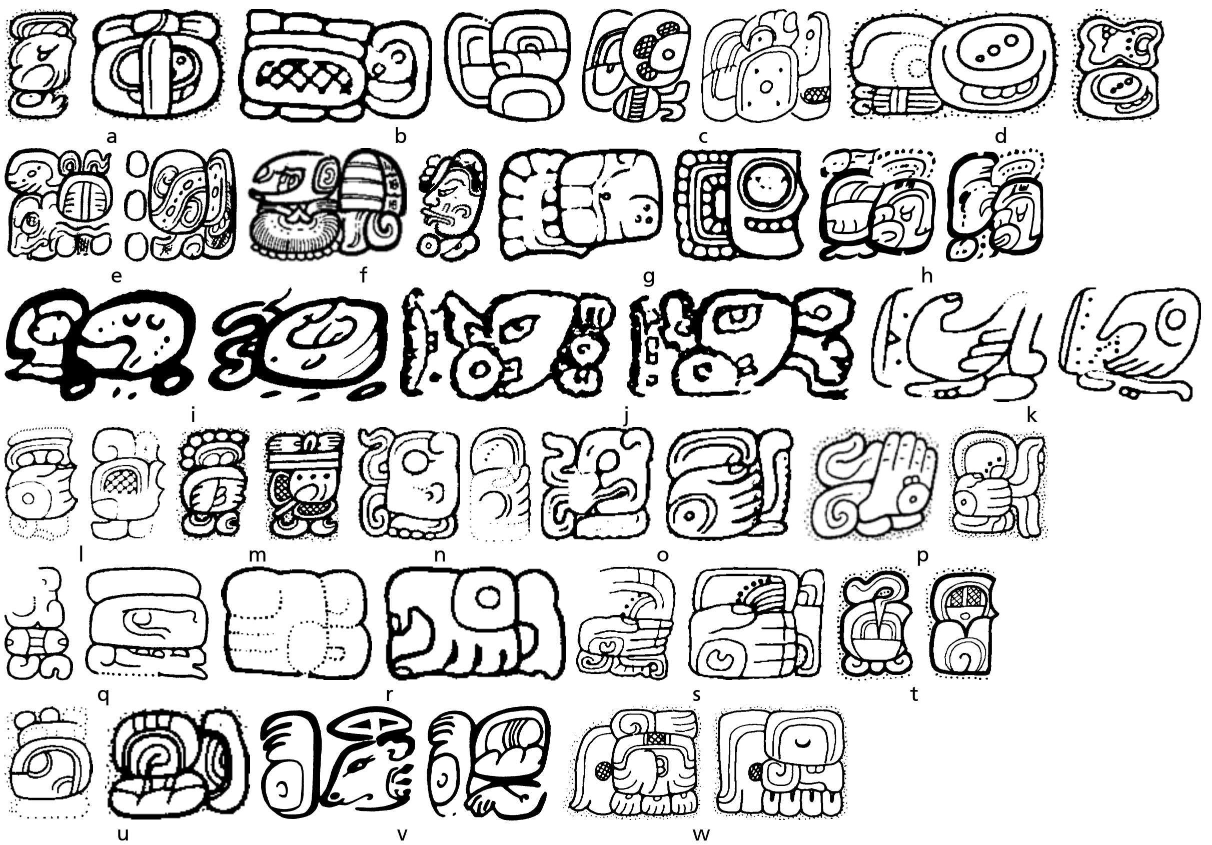


Figure 182: Suffixation pattern variability on the same monument with deviating patterns, a-b: 1PASS, c-e: 1INCH, f: 1POSS, g-i: 1ATTR, j-l: 2IND, m-s: 2ANTIP, t: 2MED, u-w: 4TEMP. **a)** AGT St. 1 – 9.15 (A7a: **ka-cha=ji**, B12: **JOY=ja**), **b)** QRG Zoo. P – 9.18 (J2: **tz'a-pa=ja**, 7-A2: **i-ta=ji**), **c)** CRN P. 2 – 9.12 (F4: **i AK'=TAJ**, I7: **i OCH=BIH=ja**), **d)** DPL HS. 2 W – 9.12 (II,B2: **AK'-TAJ**^{ja}, III,C2a: **WITZ=ja**), **e)** PAL T19B-S – 9.15 (E6: **jo-ch'o=K'AK'=AJ**, F4: **3=PALAW**^{wa}**=ja**), **f)** TIK MT. 9 – 9.1 (C1: **ye-tz'e=li**, D1b: **IXIM TE'**), **g)** ANL P. 1 – 10.1 (B3: **K'UH-hu**, C1a: **K'UH=HUL**), **h)** COL God D Vessel – n/a (M8: **CHAN**^{na}**=NAL K'UH**, M9: **KAB=la K'UH**), **i)** COL K531 – n/a (F1: **K'IN=TAN=la**, I1: ^{chi}**CHIJ=la**), **j)** C Dr. – 11.4 (2c1: **u=chu-yu**, 2c2: **u=chu=wa**), **k)** NAR Alt. 1 – 9.8 (I10: **u=TZUTZ=wi**, K9: **u=CHOK=wi**), **l)** NAR HS. 1 IV – 9.10 (G2a: **u=K'AL=wi**, H1a: **ya=k'a=wa**), **m)** AGT St. 1 – 9.15 (A8a: **ju-su=wa**, D2a: **TAN=LAM=wa**), **n)** NAR St. 21 – 9.13 (A9: **K'AK' TIL=wi**, E10a: **K'AL=wi TUN**), **o)** NAR St. 23 – 9.14 (E15: **K'AK' TIL=wi**, G19: **K'AL=wi TUN**), **p)** PUS St. H – 9.11 (A9: **PUK=wa K'AK'**, C5: **K'AL=wi TUN**^{ni}), **q)** QRG Alt. P' – 9.18 (I1: **CHOK-ko=wa**, Q1: ^{ka}**KAB=wi**), **r)** QRG St. E – 9.17 (B14: **CH'AM=wa**, B17b: **CHOK=wa**), **s)** TIK St. 31 – 9.0 (D9: **K'AL=wi TUN**, F16: **K'AL=wa TUN**), **t)** BPK ScS. 4 – 9.9 (D4: ^{lo}**LOK=ya**, D8a: **TUN.SHELL=yi**), **u)** CRC St. 3 – 9.10 (C5a: **u=KAB=ji**, D20a: **yi=ta=ja**), **v)** NTN Dwg. 28 – 9.16 (A11: **yi=ta=ji**, A18: **yi=ta=a**), **w)** PAL U055 – 9.13 (pA2: **ye=ET=je**, pA5: **ye=ET=ji**).

One must also keep in mind certain conventionalisation that do not adhere to the standard pattern. A prime example is the **CHAN**$^{(na)}$**=NAL / KAB=la K'UH** pattern (Figure 182h). The antipassive with =**wa** among *chok* occurs in 11 out of 13 cases all across the lowlands, possibly in retention of the much more common transitive use of *chok* (sampled with 56 cases).

In some limited instances, spelling patterns also become exchangeable because of possible developments in the graphemic lexicon. The Usumacinta region and especially Yaxchilan exhibits free substitutions between 1G4 **AJ** and AL2 **a** for the *aj* agentive (e.g. **a 15 ba-ki** < *a[j] ho'lajun bak*, YAX HS. 5, 85), see Wichmann (2002b: 100) for more examples. This change is likewise reflected in the suffix domain, compare **u=TZ'AK=AJ** (YAX HS. 5, 126) with **u=TZ'AK=a** (YAX HS. 5, 164), also see Chapter 4.1.5. In the analysis, such instances are underspellings, as they omit the morpheme consonant; but the question of syllabograms as morphographs (see footnote 25) is again evoked, as a local re-interpretation of sign classes may have started.

Such cases, also conventionalised deviations, moreover evoke the important question of the preferred suffixation pattern development. Lacadena and Wichmann (2004: 131-132) argue "[…] that a revolution of the spelling system was not entirely carried through by the Early Classic." They cite the **K'A'=ya** cases of this period. As exemplified by the example in Figure 130a, all four cases feature **=ya** < *=[i]y* as a 2.g.ii underspelling. The 20 samples in total that indeed deviate from the **=yi** / __# pattern scatter between 8.18 and 9.18. Chapter 4.1.12 discusses these cases less under a diachronic perspective, but more by phonetic reasons. As helpful as statistic figures are, the suffixation can only holistically be explained, including a diachronic, geographic, phonetic, and social component. Among the 'noise' of alternative suffixation patterns, it is difficult to filter any decisive evidence in favour of an evolutionary approach of orthography. Such is again owed to the source situation and the paucity of early texts, in which many patterns, like a 'Cambrian explosion', already appear manifest (Table 89).

As the figures from those cases with a determinable pattern show, all except one have the standard suffixation attested earliest, with two having variations already in the same *K'atun* interval. Underspellings usually appear shortly after, while there is often some considerable time depth before other alternatives appear. With a still limited syllabogram inventory in the Late Pre-Classic and Early Classic, suffix spellings were conventionalised in first instance and only occasionally became deprecated with the addition of new syllabograms to the graphic lexicon[970], the conventionalised suffixation was regularly solidified as 'best practice'. With the increase in text production and lexeme diversity from

[970] This assumption is partly supported by the temporal data in Table 89. When comparing the first occurrences of the standard suffixation **CV** allographs with the earliest dateable graphemes for the remaining **CV** values, the following *K'atun* intervals emerge (after Grube [1990a] and own sampling): ZU1 **ja** (8.11), 33B **je** (<9.11), 1M1 **ji** (8.7), ZUF **jo** (9.0), 1G5 **ju** (8.17) applicable for 1PASS, 1MED, 1INCH, 1ABSL, 4TEMP; AMB **la** (8.17), 1SC **le** (<9.3), 1M4 **li** (8.8), XGA **lo** (8.19), ZUG **lu** (9.4) for 1POSS, 1ATTR, 3NMLS; 2S2 **wa** (8.11), 1S1 **wi** (8.17), 1SF **wo** (9.8) for 2IND, 2ANTIP; 32M **ya** (8.8), MZR **ye** (9.0), ZUH **yi** (8.7), 1SA **yo** (9.0), 32D **yu** (8.18) for 2MED, 2COM, 2INCH; XE1 **ba** (8.19), XGE **bi** (8.17), HM1 **bo** (9.10), YSB **bu** (8.19) for 3INSTR. – The comparison clearly demonstrates that in almost all cases, (one of) the earliest available syllabograms was chosen to indicate the first dateable spelling of a certain suffix and became conventionalised. Exceptions are 1PASS, 1POSS, and 2COM (with isolated PH3 **ye** from TIK and RAZ), where relations with other suffixes that are not part of the showcases need to be investigated. Whether this was a diffusionist development or convergent innovation cannot be answered with security. But as most early inscriptions come the Central Peten, the first alternative seems logical, although the latter might in addition help to explain deviations as well (also compare to footnote 969). The comparison also shows, that **Ca** and **Ci** signs were among the first to be developed, also explaining their preference at the end of a root or for a suffix (see Chapter 4.2.3). The list also helps to explain certain peculiarities in Table 89: (1) for 1POSS, **=la** is the earliest suffixation, as the was in use before the standard **=le** first appeared; (2) the use of **=bi** for 3INSTR, as XE1 **ba** is later and AP9 was exclusively **BAH** at this time before becoming **ba**; (3) the use of **=ja** for 1PASS, 1POSS, 1INCH and 1ABSL, as they predate any other **jV** grapheme; and (4) the use of **=(C)V$_1$L** morphographs in the suffix domain for 1ATTR can be explained with the absence of appropriate **=lV$_1$** signs in a not yet sophisticated syllabic grid, although some were already in use. However, such 1.e.iv schemes were not overly common in the Early Classic and still in use in later times (see Chapter 3.3.5). In this light, the necessity for their use is contrary to the assumption made in section 5 of Chapter 3.3.6.2, before the showcase discussion and review took place. Such morphographic use in the suffix domain is not an indicator for a shift towards a more phonemic writing system, but originates from the same stipulation why Japanese introduced the *man'yōgana* (see footnote 15): to use pleremic signs in absence of cenemic graphemes.

around 9.12 on (Figure 18), there is also a growing diversity among the suffixation patterns, although alternatives generally stays beneath the lower significance bound (also see Chapter 4.2.3.3).

Showcase	Standard / __#		Alternatives					
1PASS / 1MED	=ja	08.11	=ji	09.03	=AJ	08.19	=Ø	09.12
1POS	=ja	08.18	=ji	09.12				
1INCH	=ja	08.17	=ji	09.18	=AJ	09.15	=Ø	08.18
1ABSL	=ja	08.17	=ji	10.01				
1POSS	=le	09.10	=la	08.17	=li	09.01	=Ø	09.01
1ATTR	=lV$_1$	08.18	=lV$_2$	09.16	=(C)V$_1$L	08.18	=Ø	09.00
2IND	=wa	08.11	=wi	09.04	=Ø	08.19		
2ANTIP	=wa ~ =wi	09.00	=wi / =wa	09.00	=Ø	09.14		
2MED	=yi	08.17	=ya	08.18	=Ø	08.18		
3INSTR	=bi	08.17	=ba	09.15	=Ø			
3NMLS	=lV$_1$ ~ =la	09.04	=lo	09.17	=li	09.17	=Ø	09.15
4TEMP	=ji	08.19	=ja	09.10	=je	09.11	=Ø	09.00

Table 89: Earliest datable occurrences of different suffixation patterns among the showcases.

As the showcases evidence, we find a relative homogeneity in the spelling patterns of the suffix domain, but considerable heterogeneity in the root domain. It is not only fostered by the dichotomy between syllabic and morphographic spellings, but even more by the graphematic interaction with the suffix domain that leads to an abundance of spelling schemes (Chapter 2.2.2). A root written by a single morphograph within spelling groups 2 and 3 is the most convenient way to neglect any integrative strategies and the mental process to dynamically alternate root spellings in order to provide an integrative group 1 grapheme string. Such examples may appear as equal substitutions or as a necessity in case a morphograph for a specific lexeme is non-existent (Table 74). A direct comparison of single roots in different morphosyntactic environments (Figure 183) demonstrates the flexibility within integrative root spellings (also compare to Figure 179).

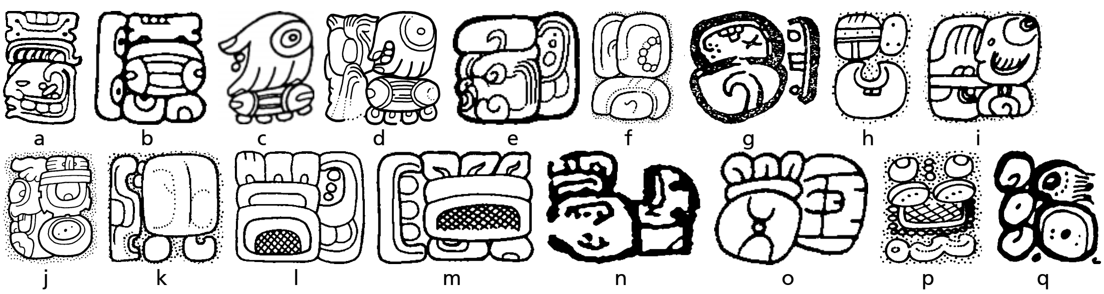


Figure 183: Spelling scheme variability in the root domain with different suffixes, a-d: *chok*, e-g: *muk*, h-i: *pul*, j-k: *tzutz*, l-o: *tz'ap*, p-q: *uk'*. **a)** **cho-ka=ja** (QRG St. F, C9a), **b)** **u=cho-ko=wa** (QRG St. D, A23a), **c)** **CHOK-ko=la** (CRN Msc. 2, A3), **d)** **u=CHOK-ko=ji** (COL Alt. Puerto Barrios, A4), **e)** **mu-ka=ja** (PNG P. 3, V5), **f)** **mu-ku=yi** (CLK Frg. 19, 2b), **g)** **u=mu-ku** (C Ma. 109b2), **h)** **pu-la=ja** (YUL Lnt. 1, B4), **i)** **pu-lu=yi** (PAL TFC, L2), **j)** **tzu-tza=ja** (COL Col. Saint Louis, D1), **k)** **u=^{2}tzu=wa** (PNG St. 3, G10), **l)** **tz'a-pa=ja** (QRG St. E, D9), **m)** **u=tz'a-pa=wa** (QRG St. C, C7), **n)** **tz'a-pa=wa** (C Pa. 3c), **o)** **tz'a-po=lo** (SRX St. 2, D1), **p)** **u-k'u=wi** (DZL St. 1, Gp3), **q)** **yu=k'i=bi** (XUL K3500, A1).

Although such fully phonemic renditions are in the minority (Chapter 3.3.3), their cross-referential analysis is the chief method exercised throughout the individual showcase discussions

(Chapter 4.1) to determine the suffix vocalisation and thus the reconstruction of its alloforms. If syllabic or mixed graphematics are used, their **CV** values point to the forward syllabogram adaptation/alteration pattern for a full phonemic grapheme/phoneme correlation in comparison with the linguistic evidence[971]. This provides the epigrapher a good confidence to transcribe the correct suffix vowel. Only in singular cases may such deviations indeed point to a full phonemic reading of rare allomorphs or vernacular forms (e.g. the ~ *–Vj* inchoative, see Chapter 4.1.3) and carry over the difference of the spoken language standard into writing. The orthographic principle to alter syllabograms at morphemic boundaries must also abrogate any harmony rule and its implication that may apply to the sole root or stem (cf. Houston, Robertson and Stuart 2001b: 15), even when not following the model of morphosyllables[972].

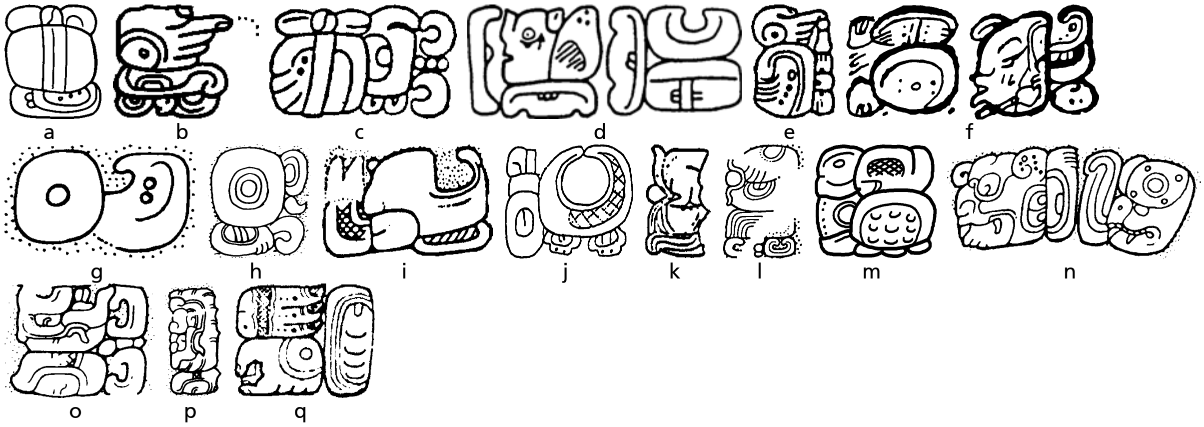


Figure 184: Spelling scheme variability in the suffix domain with different suffix strings, a-f: 1PASS, g-j: 1INCH, k-n: ANTIP, o-q: 2MED. **a) JOY=ja** (TAM HS. 2 I, C1a), **b) TZUTZ=ji=ya** (CPN St. J, W 14), **c) ^{jo}JOY=ji=ji=ya** (CPN Alt. F', B3a), **d) u-xu-lu=na=ja=ki** (CHN T3L-L3, B2-C1), **e) TZUTZ=jo=ma** (CPN St. A, A12b), **f) u=tz'i-bi=na=ja=la** (XUL K8728, B1-C1), **g) PET=ja** (COL Lnt. Hecelchakan, E1), **h) PET=ji=ya** (PAL TS, C9), **i) tu-na=ja=ka** (CHN MON-L7, C2), **j) SAK=ja=la** (YAX Lnt. 60, C6), **k) IL=ni** (CPN St. E, A13a), **l) IL=ni=ya** (PMT Mon. 11, Bp3b), **m) a-k'a=no=ma** (PAL TI-W, C6), **n) JGU^{yi}=ni=bi** (TPX MV 55, P1-Q1), **o) K'A'=yi** (DPL HBh. 1, Y1a), **p) K'A'=yi=ya** (DPL HBh. 1, R1), **q) K'A'=ye=le** (SCU St. 1, A8).

The same principle of a regular syllabogram **CV** value alteration in favour of the following morpheme applies within the suffix domain (Figure 184). The changes to the suffix pattern / … are also intensively discussed among the showcases in Chapter 4.1. Likewise, harmony rules cannot be applica-

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[971] Of the 1920 samples assigned to spelling group 1 based on this evidence, 1289 (67.1%) feature a simple syllabic root, opposed to only 36 samples (1.9%) among the 1873 group 2 spellings. Deviations with non-integrative spellings of a syllabogram at a morpheme boundary (schemes a-d in group 2) can be neglected any overall importance in the orthography, as asserted by the significance test in section 3 of Chapter 3.3.6.2.

[972] Consider a case like **PET-ta=ja** < *pet-aj-Ø* (Figure 69k). A right-to-left harmony rule application (as the value of a syllabogram is interlaced with the previous one to indicate its supposed vowel complexity) would yield *a-a* for the suffix vowel (intended to be short), but *e-a* for the root vowel, glottalised as per rule 3b (Lacadena and Wichmann 2004: 111). Yet, what would be a morphophonemic change to ***pe'(e)t-aj-Ø* is linguistically not attested, especially when contrasted to a fully harmonic case like **CHAN-na=ja** < *chan-aj-Ø* (Figure 69e). I similarly deem the listing of *och* with "**ˀo-chi**, *o:ch*" and "**ˀo-chi-ya**, *och-i:y*" in Houston, Stuart and Robertson (1998: 280) problematic, where the ClM ***o:ch* is inferred after pM, YUK, MAM, and MCH evidence. This example is among similar cases of intransitive verbs that require a final **Ci** spelling because of the *–i* [+COM] marker (cf. Grube 2000d), although such examples were later reconsidered in terms of their harmony rules (Houston, Robertson and Stuart 2001a).

ble at morphemic boundaries[973], also considering that a vowel syncope often appears with a **=CV=CV** < *–C-VC* string.

Disharmony is immanent in left-to-right syllabogram alteration owed to the underlying phonemics of a C.V morphemic boundary. An overspelling of a **CV** syllabogram is naturally required at C.C boundaries – usually between the root / stem and the first position suffix (Figure 185) – in case the lexeme is not written by a **CVC** morphograph only.

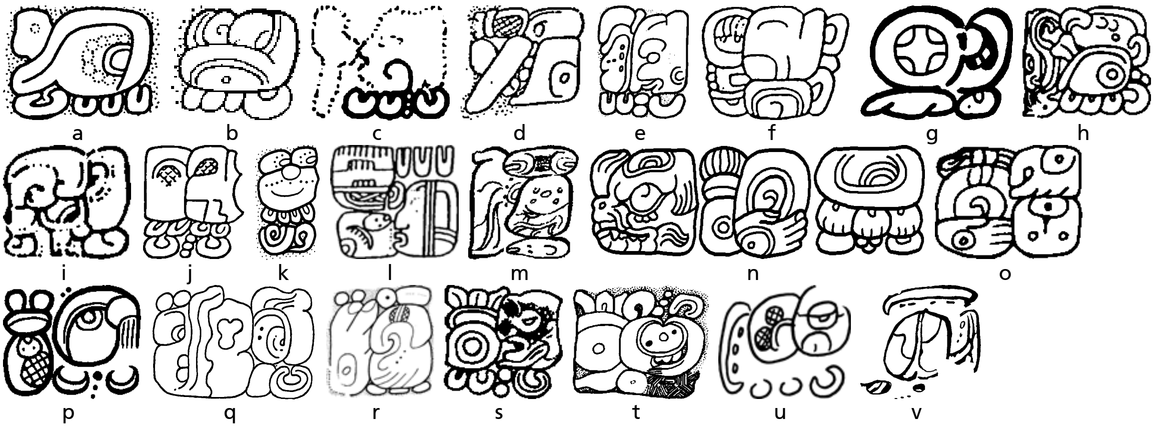

Figure 185: Synharmonic spelling scheme patterns at consonantal morpheme boundaries. **a) chu-ku=ji=ya** (TNA Mon. 84, D1), **b) CHUM^{mu}=ji=ya** (TNA Mon. 173, C3), **c) CH'AK^{ka}=ji=ya** (QRG Zoo. G, L'3b), **d) tu=JEL^{le}=ye** (CPN Alt. U, I3), **e) jo-ch'o=ji=ya** (YAX Lnt. 29, D4), **f) i k'a-a=yi=ya** (TNA Mon. 165, K1), **g) K'AN^{na}=ja=la** (NAR K635, H'1), **h) u=me-k'e=ji=ya** (CPN St. A, B7b), **i) mu-ku=ja=ya** (PNG P. 12, O4), **j) pa-k'a=ji=ya** (CPN Alt. F', A2a), **k) pi-tzi=ji=ya** (CRN HS. 2 1-VII), **l) pu-lu=ji=ya** (CHN CC-HB, 30), **m) yo=ko=bi=li** (PAL T19B-W, G5), **n) u=ti-mi=je=la** (PAL TI-W, A11-A12), **o) ti-mi=ye=la** (PAL HCWF, E1), **p) ^{2}tu=ji=ya** (BPK ScS. 5, L5), **q) ^{2}tzu=ji=ya** (PMT Mon. 8, pD1), **r) ^{2}tzu=jo=ma** (TRT Mon. 6, O2), **s) tz'a-pa=ji=ya** (CPN St. A, B3a), **t) tz'a-ya=ja=la** (PAL T18S, 176b), **u) u-bu=ji=ya** (PAL TIJE-R, 4), **v) u-tzu=ja=la** (CLK Bur. 4 Stucco Text Frg. 4, pD1).

A significance analysis of the samples among the showcases basically supports Mora-Marín (2003a: 27, 29) that synharmonic patterns indicate such a C.C boundary and are thus a secure indicator for a vowel syncope of / … suffixes. However, a morphographic spelling was preferred, if possible. Among the 314 samples, we find 260 (83.1%) cases with a morphograph (including a preposed complement), among the remaining 54 cases of a syllabic (43 samples) or mixed spelling (11 samples), 50 (92.6% of these) are synharmonic. With $p = 0.50$ and $\alpha = 0.99$, we obtain $k = 35$ and thus a strong significance for synharmony. Of the five samples that are not harmonic (Figure 186), only three are truly disharmonic (note Figure 186b retaining the original derived stem spelling), the other two are unclear or are an underspelling. To further confirm the C.C harmony rule, a full analysis of all instances from outside the showcases (see footnote 37 for additional examples) is required.

[973] Consider the case of ^{jo}**JOY=ji=ji=ya** < *jo<Ø>y-[a]j-Ø=ij=iy* (Figure 184c), where a strict application of rules 2a and 2b (Lacadena and Wichmann 2004: 109) would require ***jo<Ø>y-[aa]j-Ø=ij=iiy*, or more correctly ***jo'o<Ø>y-aaj-Ø=ij=iiy* in case it were a full phonemic spelling with **JOY-ya**.

a b c d

Figure 186: Other spelling scheme patterns at consonantal morpheme boundaries. **a) k'u=xa=ji=ya** (TNA Frg. 1, A1), **b) tz'i-ba=ja=la** (AGT Msc. Grieta Bowl, pB1-pC1), **c) tu=ji=ya** (ALS P. 1, C4), **d) ha-?=jo=ma** (CRN HS. 2, 1-V, G6a).

This is also clear for those cases, where a disharmonic root / stem pattern is deliberately altered (Figure 185m, u). However, there also several instances that regularly do not apply spelling alterations and appear synharmonic in other cases (e.g. compare Figure 185k with 55h), also often with CaC roots[974]. In return, this is also an explanation for the insignificance of synharmonic root patterns where alternations at a V.C boundary are expected (Figure 47). Only a few cases (Figure 153a-d) cannot or likely do not indicate syncopation by a synharmonic root spelling. Other cases (e.g. Figures 69l, 154b) are unclear, as the rules for second vowel syncope in a bisyllabic stem are not well understood, or when considering a vernacular pattern to which the Ch'olan phonological rules may not apply.

To conclude, the analytical investigation of fifteen individual showcases (plus four complementing instances without comprehensive sampling) and their synthesising review unfolds a versatile spelling strategy. Within a morpheme string, the grapheme choice is usually extremely flexible, while at a juncture, a convention, whether it be a harmony rule or a suffixation pattern, is retained. The principle of grapheme value adaptation within a morpheme string apparently supersedes all other orthographic standards in most cases, harmony rules included. The 'why' of this straightforward and flexible orthographic mindset can best be determined by occasional deviations of the standard 'how', possibly resulting in an emic grammatology.

4.2.2.2 – Underlying Phenomena

One of the major oppositions against a shallow phonemic orthography within a morpheme string has directly to be made, although it is rather 'meta-orthographic' and more subject of graphology. The forward left-to-right grapheme adaptation was possibly limited by two related premises: (1) to render a most perfect calligraphy, and (2) to be specific and unique. Zender (1999: iii) posited that "accurate representation of speech was often compromised for the production of beautiful texts", although I would relativise "often" to 'not uncommonly', as calligraphy moves in a stress field with orthography.

[974] A prime example is *chum*, note that there are 6 samples of **CHUM^{mu}** from showcase 1POS among the 10 cases of a synharmony pattern in a mixed spelling. With its Ch'olan *–laj* ~ *–wan* intransitive derivation, the root is also preferably written with a phonemic complement, e.g. **CHUM^{mu}=la-ja** (e.g. PAL 96G, F3a) and **CHUM^{mu}=wa-ni** (e.g. TRT Mon. 6, F7). We can almost refer to a conventionalised spelling with the otherwise nonessential syllabogram at a C.C boundary. The scribes even stuck to this practice when alteration is needed, compare to **u=CHUM^{mu}=bi** in Figure 148a (also consider the contrary with a conventionalised disharmonic pattern as with **BAH^{hi}=ja**, Figure 80a).

The full virtuosity of "the art of the Maya scribe" (Coe and Kerr 1997) can be expressed in many ways, by the elaboration of subgraphemic details or substitutions with allographs, such as with the abundant set of **u** syllabograms (Stuart 1990a: 219-221). Compositions from the vast graphemic lexicon may identify individual scribes or reflect a scribal school, and thus also a local identity by certain graphematics, such as HTF **bi** being typical for Xultun vessels (Krempel and Matteo 2012: 145), or the 'Uaxactun marker' on red-on-orange ceramics[975].

While only few inscriptions are masterpieces of an exaggerated style, most texts were surely written under the premise that Gelb (1952: 27) termed the "economy of writing", being "[…] the effective expression of the language by means of the smallest possible number of signs." Neglecting the evolutionary reasoning of Gelb's postulate, it can still be re-interpreted as a *modus operandi* for text composition. A reduction can be achieved on the phonemic and graphematic level. Zender's (1999: 130-142) investigation of underspellings demonstrated that both often appear alongside, without necessarily resulting in a simplistic calligraphy.

a
b
c

<*ḥbs* CLOTH>
/ḥebes/ – */ħibā̆s/
"fabric, clothing"

<mčv>
/mačevā/
"tombstone"

<ʔllh>
/ʔallāh/
"god"

Figure 187: Spellings in logo-consonantal and abjad writing systems in deep orthography, with transliteration, transcription, and translation. **a)** Egyptian (after Schenkel 1997: 325), **b)** Hebrew (after Frost, Forster and Deutsch 1997: 855)[976], **c)** Arabic (after Abu-Rabia 1998: 107)[977].

[975] It is possible that the SPLIT.SKY-NA combination frequently appearing in the PSS of such vessels (e.g. K6618, K7147, K8418) is an **u** allograph, as a complex sign. Helmke (2012: fig. 5d) takes the case of K8418, H1 to illustrate it as an example of the *pa' chan* emblem glyph, which is otherwise a correct identification in nominal phrases. The context on K8418 is: **ALAY^{ya} K'AL=HAB=K'UH yi=chi u=tz'i-ba=li SPLIT.SKY-NA=ja-yi yu=k'i=bi ta ? u-lu**. The word *jay* is attested as the word for the vessel type (MacLeod 1990: 363) to be inscribed. Thus, *jay* is often embedded in a sequence of possessive phrases that ends in the vessel type, as seen by examples of parallel structure that apply a regular **u** allomorph, e.g. on K4357: **ALAY^{ya} ? yi=chi u=tz'i-ba=li ? u=ja-yi yu=k'i=bi ta tzi-hi**. As SPLIT.SKY-NA always appears within the part dealing with the vessel and not its owner, it is highly probable that it serves as **u** in these instances. A compelling example is K3060, I1-J1, where **ja** is suffixed to the complex sign one block to spell **SPLIT.SKY-NA=ja-yi** < *u-jay*. The patterning with SPLIT.SKY-NA was first described by MacLeod (1990: 363-367, 423-424), but she did not suggest a phonemic substitution. Rather, she defined two parallel cases, in which those ceramics with SPLIT.SKY-NA identify a Uaxactun or El Zotz provenance (as some do, but within a nominal phrase, e.g. K6080 [Zender 2000: 1045]), as also testified by neutron activation analyses (MacLeod 1990: 365). But rather following the suggestion of a phonemic "Made in *Pa' Chan*" label, it is more likely – also with respect to the overall syntax – that this scribal school used the *pa' chan* emblem glyph on a graphematic level as a label, being only a regional allograph. This school was apparently 'plagiarised' as well, as K6508 shows a category 3 pseudo text (Calvin 2006: 26) including the SPLIT.SKY-NA component.

[976] The final ה (*he*) sign is the regular consonantal /h/, but is not pronounced and transliterated in word-final position. It rather indicates that the word ends on a vowel.

[977] The first ا (*alif*) sign either serves to indicate the lengthening of /a/, in initial position also as the carrier of the often omitted *hamzah* diacritic for the glottal stop.

Entailed by the nature of a morpho-syllabic writing system, full phonemic spellings can be disregarded in favour of more economic, non-integrative root morphographs. As integrative spellings are overall insignificant among all showcases together (Chapter 3.3.3), the indication of a full and correct pronunciation was not a major concern of the ancient scribes. The knowledgeable reader applies the cognitive process to anticipate underspelled phonemes based on an ideal vocalisation from a mental lexicon (cf. Gronemeyer 2011b: fn. 27), as especially readers of logo-consonantal or (impure) abjad writing systems (such as Egyptian, Arabic, or Hebrew, Figure 187) are forced to.

Integrative spellings are thus of more value for the epigrapher who needs to reconstruct the phonology of an extinct language based on the spellings in combination with historical linguistics. Apart from the conventionalised scholarly pronunciation, Egyptology faces the same problem, applying Coptic and then contemporary non-hieroglyphic texts (Gardiner 1957: 428-433, Peust 1999: 16, Ranke 1910, Sethe 1923). Another examples of not only successful phonemic reconstruction, but even language revitalisation, is modern Ivrit (Hebrew) based on the *niqqud* vowel diacritics of Old Hebrew used in Masoretic texts, especially from the Tiberian system (Brovender et al. 2007, Dotan 2007). Arabic occasionally applies a similar system to indicate vowels with *tashkil* (cf. Abu-Rabia 1998: 105-107, 2001: 40-41), both writing systems can choose between a regular deep and an occasional shallow orthography; depending on the text genre, purpose, and audience.

The diversification of syllabic, mixed, and morphographic root spellings in Maya writing with their varying degree of phoneticism may also reflect a facet of psycholinguistics. Studies among readers of modern Hebrew[978], which as an impure abjad is well suited to examine vocalisation, reveal interesting insights that can possibly be transferred. The learning process to read the unvowelised script is gradually increased via vowelisations, the mental lexicon becomes more sophisticated. Vice versa, the mastering of such differences also has effects on how to write.

However, this does not yet answer how any mental lexicon is organised, considering the models of (staged) full-listing (e.g. Dell and O'Seaghdha 1992) for entire morpheme strings, or parsing (e.g. Taft and Forster 1975) for the decomposition into single morphemes as the cognitive listing. Studies of cross-linguistic investigations (e.g. Waksler 1999) suggest that both models may be applicable within dual-listing, depending on the language. One example is English with regular and irregular verbs (Pinker 1991). As argued below, there is reason to believe that Classic Mayan adheres more to the parsed model because of its agglutinative nature.

Such assumption basically correlates with the statistical observation (see Chapter 3.3.3) that group 2 spellings of non-integrative nature with morphographic roots spellings comprise the majority. The ancient scribe interspersed syllabic or mixed root spellings to provide some pronunciation guide-

[978] One study (Schiff 2012) focuses on the reading speed and text comprehension of adolescent children of different age reading texts with *niqqud* (vowelised) and without (the default unvowelised script). The results imply that vowelised texts help to consolidate reading abilities and establish firm pronunciation correlations to the written, before being able to understand the unvowelised script. A second study (Schiff and Ravid 2004) investigates how adult readers deal with the perception of certain graphemes in the unvowelised script that may represent vowels, depending on the context. The results here insinuate that the handling of these cases underlie the spelling knowledge.

lines (especially in vernacular contexts), but otherwise stuck to morphographically realised roots, if available in the graphemic lexicon. Judging by the epigraphic evidence, Maya writing simultaneously varies between a shallow and deep orthography as far as the completeness of all phonemes is concerned, but is mostly deep (a phonological level of depth is discussed in Chapter 4.2.3). At the same time, calligraphic considerations may supersede this basic paradigm. After all, the scribe was extremely free to decide on the actual spelling for each glyph block.

When reading Maya hieroglyphic texts, signs or groupings thereof are usually perceived as morphological units by the mental lexicon and grammar (see Chapter 4.2.1.1). Possibly every epigrapher with an advanced knowledge may confirm that this correlation is even possible without a deeper understanding of the underlying phonemics or a specific bound morpheme function. Despite the unavailability of 'native' speakers for reading comprehension tests, it confirms the scholarly impression that spellings are more analytical (also see Chapter 4.3.1) and less induced by phonemics, as e.g. visible in the examples of Figure 180, although some patterns may be stimulated by the spoken language (consider the mediopassive =**ya** among CaC roots in Figure 129). One argument in favour is the conventionalised suffixation that clearly serves to indicate a function by graphematics rather than rendering a sign string that mirrors the underlying pronunciation as close as possible, although both factors may interrelate (see Chapter 4.2.3.2). Therefore, occasional deviations from the syllabogram adaptation principle occur and are not *per se* wrong (e.g. compare $^{\mathbf{jo}}$**JOY=ji=ji=ya** with **JOY=ja=ji=ya** in Figure 61e-f).

The deep morphological orthography is also in accordance with Ivrit, where studies (e.g. Frost, Forster and Deutsch 1997, Ravid 2001) suggest that its morphological structure with a typical 3-consonantal root morpheme (sometimes 2 or 4) is more central in reading and writing than the Hebrew phonology. Specific orthographic indicators are applied to enable a correct grammatical and semantic analysis for the reader, likewise in Arabic (Abu-Rabia 2001, 2012). The studies also imply that the consonant grouping for the root is perceived as a visual unit for the word in the mental lexicon, and less for their partial phonology[979]. This would argue for a parsed model in these languages.

The very same may be true for Egyptian writing representing another hamito-semitic language, where in accordance with its consonantal structure, the root is usually written by a 2-, 3- or 4-consonant sign with frequent complementation (e.g. Figure 177c-d), or a sequence of 1-consonant signs (e.g. Figure 177b). The root is often visually delimited from following morphemes by the postponed root determinative, while prefixed morphemes are rare (e.g. causative 𓋴 *s:*). To a great degree, the same applies for Maya writing with its much clearer distinction between pleremic and cenemic sign, often applying a **ʔVC** or **CVC** root morphograph and **CV** syllabograms for the affixes, and even

[979] In the unvowelised orthography, the glides ו (*waw*) and י (*yod*) are used for the vowels /o,u/ and /i/, respectively, omitted in the pointed orthography where vowel are indicated by *niqqud*. These semi-vowels help to disambiguate various vocalisations and meanings of a polysemic consonantal root, e.g. גדול <gdwl> /gadol/, "big" versus גודל <gwdl> /gódel/, "size" (Schiff and Ravid 2004: 245). This becomes less important with the interdigitated nonlinear structure of Hebrew and other Semitic languages, e.g. with the root <sgr>, "close": סגר <sgr> /sagar/, "closed", נסגר <nsgr> /nisgar/, "was closed", הסגר <hsgr> /hisgir/, "extradite", סגרות <sgrwt> /sgirut/, "introvertness", or מסגרת <msgrt> /misgéret/, "frame" (Ravid 2001: 463).

more to Japanese with its *kanji* lexemes and *okurigana* function of *hiragana* (see footnotes 15 and 970 for evolutionary comparison).

A parsed Classic Mayan mental lexicon also helps to explain a variety of other observations. It facilitates clear vernacular spellings in cases of code-switching, either a vernacular root with Classic Mayan inflection[980] or vice versa[981]. We may also find an explanation here for the significant increase of syllabic spellings in Terminal Late Classic and Early Post-Classic Yucatan (see Chapter 3.3.6.1), namely the shallow orthography in Chichen Itza and its hinterland. This ‘scribal school’ (see footnote 77) is then the product of underlying psycholinguistics, to facilitate text comprehension within a basic Classic Mayan tradition (Houston, Robertson and Stuart 2000: 335) in a region of spoken vernacular Yukatekan[982], but emphasising a regional high-variety (see Chapter 4.3.4.3). As far as the showcases and the suffix domain as the major focus of this study are concerned, individual spellings that deviate from the orthographic standard, as determined by statistical methods, may indeed be re-interpretations based on the competency of an individual scribe and the amplitude of his mental lexicon.

How does the writing system comparison and mental lexicon organisation affect the model of morphosyllables? It provides a cognitive argument against their necessity. Similar to syllabic spellings in Maya, Egyptian writing equally applies 1-consonant signs for roots and bound morphemes, while multi-consonant graphemes are exclusive to the root domain. Only occasionally do determinatives occur among bound morphemes, namely with the dependent pronouns of the first person singular with ~ ~ , and with plural and dual (Gardiner 1957: § 34); but these do not contribute any meaning, as their absence e.g. among the demonstrative pronouns shows (Gardiner 1957: § 110). When roots and affixes are mentally distinguished in a parsed model, the reader can correlate graphemes or a grouping thereof in a 1:n relation with a set of related morphemes and decide by the morphological and semantic context which reading and function is intended. Therefore, underspellings do not provide any substantial obstacle, as a 1.g.i scheme at least provides the suffix vowel. If morphosyllables were so important to provide meaning to a suffix and were vital for a 1:1 correlation with the

980 Examples (also possible ones including possible fossilised roots/stems) among the showcases are: *bo<h>t’-aj-Ø* (footnote 594), *se<h>l-aj-Ø* (footnote 598), *ch’ob-aj-Ø* (footnote 667), *ch’oy-ah-Ø* (footnote 668), *k’u’-ul* (footnote 750), *u-pak’-a-Ø* (footnote 801), *jut-uw-Ø* (footnote 830), *tz’un-uw-Ø* (footnote 838), *yok-oy-i-Ø* (footnote 850), *way-ab-al* (Figure 154b).

981 Examples (also tentative ones) from the showcases include: *chok-Ø-Ø* (footnote 315), *u-hil-i-Ø* (footnote 315), *u-pek-aj-Ø* (Figure 203i), *chan+k’u’* (footnote 759), *kok-om* (footnote 776), *k’ay-il* (footnote 920), *u-woj-ol=e’* (footnote 927).

982 This could very well be a mutual process with scribes lacking sufficient competency to handle the traditional way of writing. But a more shallow orthography is also visible in Japanese, when *hiragana* are used as *furigana* to complement rare *kanji*, or a complete abstinence of *kanji* in favour of *katakana* for uncommon *kanji* or in loanwords (see footnote 15). If these inferences are correct, some light can also be shed on the codical text tradition (see footnote 118), especially the Dresden Codex. As the analyses in Chapter 3.3.6.2 further demonstrate, non-integrative spelling of group 2 representing the deeper orthography become more common in the codices again. It may be a clue for an archetype and that the manuscripts comprise of a considerable conservative core of almanachs that was copied from older sources (like Middle Egyptian and its orthography remained the language of sacral texts in the New Kingdom and beyond [Baines 1983: 584, fig. 2]), also see the comparison with Ptolemaic writing system and its graphemic lexicon (footnote 586). However, as we face a considerable source hiatus between the Early Post-Classic and the time of the codices (except mere calendrical texts from sites such as Mayapan), it is hard to assess such assumption.

mental lexicon, then underspellings would not be so frequently represented in writing. Interestingly, while I argue with Ivrit in favour of the two traditional sign classes, Houston, Robertson, and Stuart (2001b: 18) compare Hebrew punctation with the purpose of morphosyllables, but entirely miss any cognitive model.

The underlying mental lexicon raises the question whether the use of identical **CV** signs among different suffix functions (e.g. =**ja** / __# for the passive thematic, inchoative, positional, and absolutive) relates at all to a still elusive emic classification. Section 2 of Chapter 3.2.2 speculates on related semantics at least for certain suffixes, but this cannot be the sole possibility. As the internal and comparative evidence suggests, it is not necessary to provide a shallow suffix orthography, as the visual indicator is not decoupled from the lexical class and context to determine the suffix function. Also, the preference for =**Ca**, =**Ci**, and =**Ce** / __# syllabograms is still elusive in general terms and obviously not monocausal, except that the three are the basic unrounded front vowels. A morphological necessity is only given for 2MED =**yi** among the investigated cases. In most instances, a strong inclination to mirror the suffix vowel is given with =**ja** among 1PASS, 1MED, 1POS, 1INCH, and 1ABSL, =**le** among 1POSS, =$\mathbf{lV}_1$ among 1ATTR (although not a constant pattern), =**bi** among 3INSTR, and to some degree with =**le** / =**lo** among 3NMLS, and partially with =**wa** / CaC__# among 2ANTIP. A neutral vowel suffixation may also intersect other observations or be the sole implication, as with =**wa** among 2IND, to which also historic reasons of former vowel harmony may apply (see footnote 314).

The consideration of a mental lexicon also explains why suffixes with a variable vowel, as investigated in test and control group 3 may not require a vowel-providing spelling to ensure a proper pronunciation. But leaving the actual limited phonemic range and contextual conditions apart, it is more graphematics that dictates the rules. There is a graphematic purpose of writing economy, exemplified by *uk'*. The abundance (90.8%) of its instrumental derivation is realised by group 1 spellings for a full phonemic *y-uk'-ib*. In terms of the sign complexity, **k'i** requires less brush strokes or surface cuts than **UK'**, hence it is easier and faster to write **yu**=**k'i**=**bi** than **yu**=**UK'**=**bi**. In the latter case, compensation was likely achieved by underspelling =**bi**, as 13 out of 15 samples (86.7%) simply write **yu**=**UK'**. This assumption is also supported by the distribution of **bi** allographs among the 368 samples / __#: 309 (84.0%) apply the simple XGE 'quincunx' variant, only 47 (12.8%) use the more complex AC6 'snake' grapheme, while 8 (2.2%) write HTF 'footprint' as the regional north eastern Peten variant. When removing all instances of *uk'* from the showcase, the figures are not too different: 57 of 67 samples (85.1%) feature XGE. The full syllabic **yu**=**k'i**=**bi** is also more pleasing for a block composition, as it can combine two 'affixes' with the quadrangular **bi** grapheme, while **UK'** adds another 'main sign' shape to the block (compare Figures 145c-e, g-i and 148b).

As a somewhat contrary example, the reason why *way-ib* and *way-ab* are seldom written by a group 1 spelling is not so much because of writing economy, as **WAY** is a rather complex sign. For a full phonemic rendering, both **yi** or **ya** are to be used block-medial. It was possibly not deemed very calligraphic because of their irregular shape in combination with the likewise irregular **wa**, while the frequent infixation of **bi** into **WAY** is a much more elegant solution, even if information of the spoken language is lost. A similar aesthetic reason may apply to the sign transposition of **wi** in the name of *K'ahk' Tiliw Chan Yopat* (Figure 176m) to avoid a block internal spacing.

4.2.3 – Synharmonic and Disharmonic Patterns

This chapter comprises a short and general discussion on the different models of harmony patterns, their implications, and validity. As the focus of this study lies less on the root domain, the models are more reviewed by statistical tests based on the published data. A broader phonological consideration is complemented, also facilitating and tightening the considerations conducted for the suffix domain.

4.2.3.1 – Harmony Rules in the Root Domain

Both the original vowel disharmony model (Houston, Stuart and Robertson 1998) and the modified rule set (Lacadena and Wichmann 2004) exhibit two detrimental lacks in the data presentation: (1) the hypotheses are biased by providing only one exemplary harmony rule spelling example for a lexeme that in most cases supports the model, possibly picked by an individual impression from the corpus; and (2) the word list also contains (lexicalised) derivations where a different rule set may apply, also bisyllabic words where only the last syllable can be affected (see footnote 33).

A binomial significance test (as outlined in Chapter 2.5.2) is applied to test the data from both studies on their plausibility. Hereby, H_0 assumes the authors' assumptions to be true, while H_1 seeks to falsify the implications of their hypotheses, hence n must be equal or larger than k. The attempt to reject the significance for the indication of complex vowels is in accordance with the study's overall denial of long [Vː] and glottalised [Vʔ] ClM vowel nuclei, based on phonological and historical considerations (see section 1 of Chapter 3.2.1 and footnotes 35, 73, and 109). The significance test also has to acknowledge the different objectives of the (dis)harmony permutations and must provide lower bounds for different, yet similar groups within each model[983]. A comparison between the test results (Table 90) unveils the contradiction between both models, but also proves that the test applied does not statistically support any model with sufficient confidence.

[983] For Houston, Stuart and Robertson that correlate inferences from historical linguistics with observed patterns in the script, these are: (1) synharmonic / short, (2) synharmonic / unmarked, (3) disharmonic / complex, and (4) disharmonic / short. For Lacadena and Wichmann, that more rely on a reconstructed ClM nucleus based on their rules, these are: (1) synharmonic / short, (2) disharmonic / long, (3) disharmonic / glottalised, (4) disharmonic / counter. Note that there are inconsistencies in the data presented by Lacadena and Wichmann, e.g. they once provide the synharmonic **ku-tzu** with *kutz*, and once reconstructed as *kuutz*. In such instances, the transcribed form that complies with one of their rules is preferred in the significance test.

Group	*n*	*n* (%)	*k*	*p*
V_1-V_1	30	32.97	41	0.33
V_1#-V_1	17	18.68	18	0.11
V_1#-V_2	43	47.25	7	0.03
V_1-V_2	1	1.10	14	0.08

a

Group	*n*	*n* (%)	*k*	*p*
V_1-V_1	58	40.85	23	0.10
V_1:-V_2	40	28.17	40	0.20
V_1'-V_2	37	26.06	40	0.20
V_1-V_2	7	4.93	6	0.01

b

Table 90: Statistical significance test results for disharmony patterns in the root domain. **a)** After Houston, Stuart and Robertson (1998: 279-284, fig. 1) with N_S :=|91|, **b)** after Lacadena and Wichmann (2004: 136-162, tab. 6.9) with N_S :=|142|. Parameter α = 0.99 in all cases.

For the Houston, Stuart and Robertson model, there is a significant amount of lexemes that are disharmonic, but also part of the reason the lower bound is quite low because of a small *p*-value caused by the many possibilities for a complex vowel. The amount is not necessarily proving the case that disharmonic spellings do indeed indicate a complex vowel, as the number of synharmonic lexemes with a short vowel is not significant and for each final syllabogram vowel, there are diverging results[984]. The test simply delivers a plausibility for the assumption that disharmony serves some purpose, as the correlation with linguistic data heavily relies on modern EM and especially reconstructed pM evidence. This is not so much applicable, as it ignores WM phonology, especially the assumption that long vowels were already obsolete in late pGT before the pCh / pTz split (see footnote 109). In summary, the test provides two insights: (1) the significance heavily depends on the lexeme amount and data selection and must be reviewed on a more granular level, and (2) the root patterns reveal the same observation as in the suffix domain with /a/ and /i/ as the preferred vowels for complementation.

For the model after Lacadena and Wichmann, the test result is inconclusive. In contrast to the previous model, the amount of synharmonically spelled lexemes for a supposed short nucleus clearly is significant, harmony rule 2 for a long vowel is at the lower bound; while rule 3 for a glottalised vowel is barely not significant. The last group, the examples that contradict the rules is also large enough to be significant. An acceptance is however reached when the overall significance level is lowered to α = 0.95, But the hypothesis design features a problematic flaw that is revealed in the testing. Linguistic evidence is subordinated to the rule set, e.g. visible in the application of a reconstructed /h/ along an inferred complex vowel (see footnote 35 for such impossible nuclei as e.g. in ***tu[u]'[h]p*)[985]. This methodo-

[984] With a lower α = 0.95, group 2 would result in k = 15, thus unmarked spellings would become significant as well. When taking all unmarked spellings (groups 1 and 2) together with α = 0.99, the result is n = 47 (51.7%) with k = 9 and p = 0.08. Examining the patterns among the second vowel (V = /a,i,u/), Houston, Stuart and Robertson (1998: 288) examine on the basis of relative frequencies. Applying a significance test to the 'correct' correlations (i.e. synharmonic = short and disharmonic = complex), then each is individually significant, as is the unmarked/incorrect coupling of groups 2 and 4. But taking groups 1 and 3 with the marked, predictable correlation together, the result is not consistent. A *V-a* pattern is significant with n = 27 (81.8%) at k = 23, *V-i* is significant with n = 34 (89.5%) at k = 26, while *V-u* cannot be proven with n = 12 at k = 26 (all with p = 0.50 and α = 0.99). The authors also do not provide any harmony patterns with V = /e,o/. The figures also reveal that within each vowel combination, there are certain preferences: with **Ca**, most cases appear in a synharmonic environment, while with **Ci**, the majority appears with a disharmonic root vowel, for **Cu**, the cases more or less equally distribute across all combinations.

[985] One example is the evidence for **K'UH-tzi** as ***k'uuhtz*, "tobacco" (Lacadena and Wichmann 2004: 147), only attested in C Dr. 15a. As per harmony rule 2a, *u-i* should indicate a long vowel, as supported by ITZ, MOP, and YUK evidence. The /h/ is superimposed by evidence from CHL and CHR, as well as pM. Even more disturbing is the case of **yi=ch'a-ki** as ***y-i[h]ch'aak*, "claw" (Lacadena and Wichmann 2004: 161), also given as ***y-*

logical fallacy is also correctly pointed out by other authors (Robertson et al. 2007: 32-38), but not tied to morae. Subjugating the harmony rules to a significance test therefore tends to be a 'self-fulfilling prophecy', only signifying that certain vowel combinations occur more often than others. But overall, there is a tendency to consider the disharmonic spellings not to be significant at all, whereby the theory would falsify itself. Again, this is no proof for the existence for a correspondence between orthography and phonology. The data from Lacadena and Wichmann concur with the previous model in that /a/ and /i/ are the most common vowels for the final syllabogram.

As indicated, the data from both models are biased by the majority of lexemes (52 or 36.6%, figures after Lacadena and Wichmann) being a CaC or CVCaC form that often feature synharmony (15 or 28.9%). Furthermore, the disharmonic *a-i* pattern is the single most one with 23 (16.2%) forms. This reminds of the prominence of 1.a.i samples in the data base which are triggered by the majority of CaC roots, adhering to showcases 1PASS and 2IND that have to be synharmonic (see Chapter 3.3.6.3). A statistical test can never explain a pattern alone, but still the analysis raises heavy concerns on the correctness of both models, keeping tensions with linguistic data apart. Although the data base for this study records 219 different lexemes, it regularly does not include simple root spellings. The desired correlation between lexemes and their preferred harmony pattern cannot be achieved here[986], also considering that a verbal root harmony pattern is seldom attested (the only proven case being **tza-ku**, see footnote 780)[987].

With any of the two disharmony models not securely indicating complex vowels and proving their existence in Classic Mayan by a considerable set of minimal pairs, it is apt to consider alternative hypotheses that pre-empt a statistical significance. The preference for /a/ and /i/ especially worked out for the suffix domain in Chapter 4.1 and strengthened here is key, and this inclination among root spellings conceptually cannot support the indication of complex vowels. Furthermore, as the not exhaustive survey in footnote 970 suggests, **Ca** and **Ci** syllabograms were among the first to be used in the script, thus making complementations with **Cu** a much later pattern. This diachronic perspective will

ich'a:k by Houston, Stuart and Robertson (1998: 280). All the evidence cited from pM, MOP, YUK, ITZ, CHL, CHN, CHR, KCH, MAM, and MCH indicates /a/, CHN specifically /ä/. According to the general rule set up by Kaufman and Norman (1984: 115), pM */aa/ > pCh */a/ and pM */a/ > pCh */ä/. Thus, ClM *y-i[h]ch'ak* cannot yield a long vowel even as a reflex (although /h/ in the first syllable can be reconstructed by internal CHL and CHR evidence), vowel complexity is simply inferred from a disharmonic spelling.

986 But the data base can provide some tendencies provided by the usual block-wide entry that often encompasses the syntactic patient. When ignoring any cases that do not indicate any harmony by not complementing or underspelling or that have a suffix following; and considering five basic spelling patterns based on the vowels represented in the script, we obtain $p \approx 0.20$ and $\alpha = 0.99$. For example *tun*, "stone", $N_S := |121|$ with $k = 35$. With **ni**, $n = 121$, thus it is a very significant pattern. For *ch'aj*, "droplet", $N_S := |41|$ with $k = 15$. Here, **ji** is significant with $n = 39$, with **ja**, $n = 2$. Besides individual lexeme testing, all 25 permutations of vowels would require a significance test based on their sample cardinality. Only then it is possible to (1) define a root / stem orthography for individual roots and possibly stems, and (2) derive basic correlations for preferred vowel combinations (including proper corrections that factor out the impact of frequent forms) whose supragraphematic implications must be checked against any possible phonological pattern that might thus be indicated.

987 In fact, Houston, Stuart and Robertson (1998) concentrate on nominal roots, as a verb can never stand alone, it requires tense/aspect markers and pronouns for its arguments. As a derived noun with the –Ø suffix (Chapters 4.1.9 and 4.1.14), it still can indicate an underlying harmony pattern helpful for the pronunciation of the root.

further elucidate the development and purpose of harmony rules in the rood domain. Although only being a hypothesis in the light of the missing phonological data, I re-address the case of syllable weight and lexical stress already provided in section 2d of Chapter 3.2.2. As the investigation of the root domain is not in the focus, I can still only present some tentative considerations to foster the scope of future studies eliminating the desiderata outlined in footnote 986.

In elaboration and partial reversal of the thoughts sketched in Chapter 3.2.2, several different models are possible. Generally, synharmony is sought to represent the standard allophone of a vowel at or near the cardinal points of the vowel trapezium, i.e. [a], [e], [i], [o], [u], as in CHL (Attinasi 1973: 54-60) and CHN (Knowles 1984: 35-37), also putting lexical stress on the root, e.g. **cha-ya** < *chay* *[ˈt͡ʃaj] (YAX HS. 3 I tr, D6) and **wi-tzi** < *witz* *[ˈwit͡s] (YAX Lnt. 43, D3a). A closed heavy syllable with /h/ is likewise often unmarked, e.g. **bu-ku** < *bu[h]k* *[ˈb'uhk] (NAR K1398, L1), but not necessarily, as with **pu-tz'i** < *pu[h]tz'* *[ˈpuht͡s']. This correlates with the observation that pCh *CVhC forms became stressed CVC forms in CHN (Knowles 1984: 62). However, there are plenty of counter-examples when assuming a pronunciation following the pCh reconstruction, e.g. **k'a-ba** < *k'ab* *[k'əb'] (YUL Lnt. 1, E4) or **K'AN**[na] < *k'an* *[k'ən] (TRT Mon. 6, M3b); but the written ClM articulation might have been different, such as *[ˈk'ab'] or *[ˈk'an] (see below).

Disharmonic complementation with **Ca** and **Ci** syllabograms in dependence of the root vowel may generally indicate a lax, usually unstressed vowel. A key witness is the sixth Ch'olan vowel, otherwise not distinguished in the orthography, and thus considered only as an allophone in ClM. Apart from possible deviations between spelling with /a/ and /e/ (see footnote 922) that sometimes appear, the prominent *a-i* disharmonic pattern may be an explanation in correlation with pCh *CäC roots, e.g. **ba-ki** < *bak* *[b'ək] (BPK Str. 1 R2C41, A2), enhanced to other vowels, such as **TUN**[ni] < *tun* *[tʊn] (QRG St. A, A11). Again, several examples that seemingly contradict are found, e.g. **na-bi** < *na[h]b* *[ˈnahb'] (PAL 96G, J6b). An *ad hoc* explanation for the other combinations is not readily available, while unstressed lexemes may also apply to some of them. Also, **Ca** may additionally be subject to a specific pattern if it was indeed chosen as a neutral vowel grapheme because of its proximity to [ə] (see footnote 316 and section 2b of Chapter 3.2.2).

In contrast to the tentative conclusion in Chapter 3.2.2 with its higher liberty to speculate upfront the showcase discussions, I do not attempt to touch on bisyllabic spellings here, as their articulation is momentarily too far beyond any solid reconstruction. For these, different vowel permutations may indicate either no stress, or primary and secondary stress, e.g. **ba-la-ma** < *ba[h]lam* *[ˈb'ah.ləm] / *[ˌb'ah.ˈlam] (CAY St. 1, Dp9). The disharmony patterns might furthermore involve the consonant of the root coda, causing the nucleus to be a tense or lax vowel. Whatever the correlations are and what possible patterns evolve, the rules to be derived need to be more specific than the marked / unmarked contrast applied by Houston, Robertson and Stuart and less strict than the rule set by Lacadena and Wichmann to be significant and applicable enough.

The preferred suffixation patterns (Table 73) with their visual reading aid also suggest that some disharmonic spellings are a form of heterography, besides or in addition to other implications usually indicated by disharmony. Such distinction can otherwise neglect the reconstruction of complex vowels, but may be suggestive of the supragraphematic distinction between [a] and [ə]. One example is **ba-ki** < *bak* *[ˈb’ək], “bone” and **ba-ku** < *bak* *[ˈb’ak], “child” (Lacadena and Wichmann 2004: 134-135).

The revised harmony pattern approach (Robertson et al. 2007) is not further considered, as it basically roots on the original (Houston, Stuart and Robertson 1998) model and still operates with complex vowels. While the authors (2007: 7) argue with quantity and quality, they use these terms not in a phonological sense, but in combinatory logic to explain articulatory possibilities of vowels in a quantitative system. The resulting ‘rules’ (Robertson et al. 2007: 10) re-define those from Lacadena and Wichmann (2004). An appendix with 139 entries is provided (Robertson et al. 2007: 42-54), but still bases on exemplary spellings which are not empirically tested against the evidence.

To conclude, I agree with the authors of both studies that the harmony / disharmony dichotomy is an orthographic principle of supragraphematic nature. But based on its precursors, both studies reconstruct a ClM system of vowel quantity (length) as a low-ranking contrast, and by comparison with Yukatekan and Eastern Mayan languages. I abolish any vowel length in pCh based on comparative evidence with Ch’olan and Tzeltalan, and consider a yet to be determined disharmony pattern to indicate vowel quality (tenseness). It is not only a matter of articulatory differences, but the system is fundamentally different because of the higher hierarchy of contrast (Figure 188), as proposed by Oxford (2012). As a shallow orthography, the allophonic vowel length, otherwise not directly represented in the script is also interrelated with syllabification along with stress and syllable weight[988]. The ClM [Vh] is reconstructable from a backward and forward direction always carries stress and is tense, while the ClM [VʔV] causes syllabification, where the left and right vowel may take a different tenseness (e.g. **bu-la** < *bu['u]l* *[ˈb’u.ʔʊl] on K2914, Z1). When long vowels were apparently lost in late pGT (see footnote 109), the hitherto inherited vowel system from pM and pWM switched from a quantitative to a qualitative system. But this assumptions is still pending a more thorough review, also for Eastern Mayan that seems to remain a quantitative system.

[988] The indication of vowel length as a low-ranking hierarchy is a regular phenomenon in alphabetic writing systems, when these differences build minimal pairs, e.g. by gemination (as a sequence of short vowels) in Finnish (Harrikari 2000). Non-phonemic distinctions of vowel quantity or quality often do not involve a specific orthography, but are implicit by the consonantal skeleton. In Italian, the vowel before a geminated consonant is usually lax, but tense before a simple consonant, it but may become long because of the morphology (Valesio 1967: 252). As the case of Italian shows, the degree of distinction between lexical and phonemic allophones within a language is a continuum. English is an interesting case, as Hammond (1997) suggests that vowel quality [±TENSE] and syllabification [±STRESS] interrelate, as posited here for ClM.

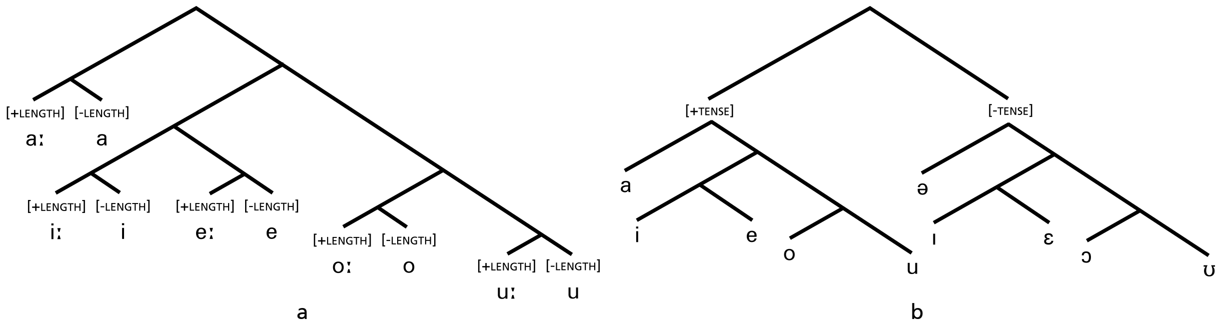

Figure 188: Contrastive hierarchy of vowel subsystems. **a)** Quantitative vowel contrasts, **b)** qualitative vowel contrasts. Modified after Oxford (2012).

It is also important to point out that the proposal for an orthography that indicates stress, syllable weight and vowel quality does not necessarily need to correlate with the spoken pCh or WCh / ECh phonology at any given time while the script was used. With ClM as a primarily written language, harmony patterns might indicate a differing 'received pronunciation'. To be able to eventually work out the purpose and mechanism of disharmony, the Ch'olan vowel system must be better understood. A case study of how to reconstruct the vowel system of an extinct language by its modern daughters is Old Mongolic (Ko 2011), applying the same contrastive hierarchy methodology (Dresher 2003, 2009) used in Figure 188 for the two extremes of such vowel system typology.

4.2.3.2 – Harmony Rules in the Suffix Domain

The discussion of the harmony rules in the suffix domain has to take a different course for a couple of reasons. In contrast to the root domain, there is less agreement that a specific rule set and thus the occurrence of vowel quantity applies. Houston, Robertson and Stuart (2001b) make it unnecessary with their morphosyllables of *–VC* suffixes. Lacadena and Wichmann (2005b) propose phonologically distinct minimal pairs of *–VC* suffixes by their (2004) root rule set, also for *–CVC* forms.

Following the premises taken for this study and taking into consideration the alternative model of the purpose of disharmonic spellings, then the issue easily resolves. The linguistic evidence presented in Chapter 3.1 yields no evidence for vowel quantity in Ch'olan languages, even more, many cases with CaC roots feature a qualitative alteration to /ä/ in the suffix, and sometimes also in the ablaut (see section 2d in Chapter 3.2.2). Only in a few cases may glottalisation of the suffix vowel appear as a morphophonemic process, but it would always separate two adjacent vowels into different syllables. Simple roots are always consonant final (except certain particles), following a *ʔV(h)C* / *CV(h)C* / *ʔVCVC* / *CV(h)CVC* pattern, thus a disharmony rule set yet to be determined can specifically spell the appropriate **CV** syllabogram. In contrast, stems and affixed forms may end in a vowel, such as the imperative (see Chapter 2.1.4 and Figure 203k) or the mediopassive (see Chapter 4.1.12), requiring a specific **CV** syllabogram. Also, the preferred suffixation pattern (Table 73) does not (always) allow the writing of the **CV** syllabogram that would be appropriate according to the rule set for the root domain.

This is best demonstrated in the study by Lacadena and Wichmann (2005b) that attempts to enlarge the fixed rule set to the suffix domain. The evidence appears quite selective, as it only provides compelling minimal pairs to demonstrate the distinction by vowel quantity, while a consequent application not only creates a division between functionally different suffixes, but also within (see footnotes 311, 623, 678, 762, 931, and 937), e.g. **Ce=wa** < ***–e'w*, **Ci=wa** < ***–iiw* **Ca=wa** < *** –aw* among showcase 2IND. While the morphosyllabic proposal remedies such quantity divergences, its design causes new issues (see Chapter 4.2.5.3). None of the hitherto proposed disharmony models can directly apply to the suffix domain.

The statistically determined patterns of suffixation (Table 73) also interfere with the above assumption that harmony patterns indicate syllable weight and stress in combination with vowel tenseness. We again face the problem that ClM phonotactics are unknown and the data for modern Ch'olan languages are also not comprehensive. In CHN (Knowles 1984: 62-63), lexical stress is always dominant, but may shift to the last syllable, at least among a simple *–VC* derivation (see footnote 527); in CHR (Fought 1967: 48-49, 101-103), it also seems to lie on the root, but may also move to an ergative pronoun, but commonly to the last syllable of a word[989].

If there is a general tendency towards a final syllable stress, then several phenomena in relation to the suffix domain become explainable in an educated guess. The second vowel syncope of a *ʔVCVC* / *CV(h)CVC* root and first suffix vowel syncope in a *–VC-VC* string retains a bisyllabic structure. The stress changes from the root to the suffix(es), unless/despite the first syllable is already heavy, e.g. **u-xu-lu=ja** < *uxl-aj-Ø* *[ʔʊx.ˈlax] (CRN P. 2, O7) or **u=ti-mi=je=la** < *u-tim-j-el* *[ˌʔu.tɪm.ˈxel] (PAL TI-W, A11-A12). The frequent synharmony between the suffix vowel and the mute syllabogram vowel (see Chapter 4.2.2.2) also may indicate the standard allophone in the suffix, e.g. **u=BAK=le** < *u-bak-[e]l* *[ˌʔu.bə.ˈkel] (EKB Msc. 7, C1) or **chu-ka=ja** < *chu<h>k-aj-Ø* *[ˌt͡ʃuh.ˈkax] (EXC P. 2, B6). Constant patterns with a majority of disharmonic spellings for most variable root suffix vowels are more difficult to explain, e.g. =**wi** / CVC__# (V ≠ /i/) among 2ANTIP or =**wa** / __# (V ≠ /a/) among 2IND. Such patterns may thus indicate a continuance of the root stress, while the suggested harmony-stress indication would need to be abrogated in certain instances, e.g. **u=bu-t'u=wa** < *u-but'-u* *[ˌʔu.ˈb'u.t'ʊ] (PAL PT, N11) and **u=ma-ka=wa** < *u-mak-a* *[ˌʔu.ˈma.kə] (MQL St. 5, A3), compare to footnote 526. Also, **Ca** syllabograms may in addition have a specific significance as s 'marked' spelling for certain suffixes, because of the proximity to the neutral [ə] (see Chapter 3.2.2, section 1) to annul any other rule, e.g. **u=tz'i-ba** < *u-tz'i[h]b-a-Ø* *[ˌʔu.ˈt͡s'ih.b'ə] (K578, B1) or **k'a-ba=la** < *k'ab-al* *[ˈk'a.b'əl] (YAX Lnt. 28, Q1b).

In conclusion, shifting stress may not only distinguish lexemes and grammatical forms, its indication by a shallow orthography, namely supragraphematic harmony patterns, would also be a valuable guideline for the correct utterance of a hieroglyphic text. Such orthographic intent is important in two respects. Classic Mayan was a standardised written high variety (see section 3 in Chapter 3.2.1), largely

[989] Note that the stress patterns also serve to distinguish meaning, compare to CHN *u-hok'-i-Ø* with [ʔu.ˈho.k'i] as "[h]e dug it out" and with [ʔu.ho.ˈk'i] as "[h]e called him (Knowles 1984: 62).

to be protected against vernacular influences despite its occasional permeability. And if monumental inscriptions were indeed part of an oral history and subject to public lecture (Houston and Stuart 1992: 591, Stuart 1995: 85), then harmony patterns additionally provide all necessary information for the correct prosody of recitation[990].

The correct interpretation of harmony patterns both in the root and suffix domain, and their (socio-)linguistic purpose remains an open question for further research. It must relate empirical figures with phonological data to be tested under an adapted Optimality Theory (Prince and Smolensky 1993) to determine a significant output on the orthographic level by the linguistic input.

4.2.3.3 – Loss of Disharmony?

The authors of the two primary studies of the harmony rules also posit the use of synharmonic spellings from the Late Classic on where disharmony would be expected (Houston, Stuart and Robertson 1998: 284-285, 291-292, Lacadena and Wichmann 2004: 115-116). Under the assumption of vowel quantity, both studies correlate the phenomenon with sound changes to simple vowels as present in the modern Ch'olan languages. With the operational paradigm of vowel quality laid out above, synharmonic alterations (Figure 189) are less the loss of disharmony as an orthographic epiphenomenon, but rather the occasional disregard of the standard convention. It is important to stress that a 'loss' does not necessarily need to be tied to language change. As Houston, Stuart and Robertson (1998: 292) point out, the process cannot explain why the Postclassic codices continue to use the Classic harmony patterns[991].

Houston, Stuart and Robertson (1998: 291) see the trigger for the sound change either in dialectal spread or the socio-political upheavals of the Late Classic. Even if these occurred, their later development of the morphosyllables (Houston, Robertson and Stuart 2001b) does not take up the disharmony 'loss' that appears in the suffix domain. It would in fact argue against the necessity for morphosyllables, unless the socio-linguistic development also affected the graphematic lexicon. However, this would find the reflection in more profound changes as attestable.

[990] The suspected ClM 'received pronunciation' supports the correct prosody, although not directly dictating it. See Skopeteas (2010) for the prosodic structuring of YUK by means of topical enclitics. If prosody was one intent of the orthography, it is surely not as sophisticated as the *te'amin* cantillation marks in the Masoretic text tradition for the correct recitation of the Tanakh. Although the system is primarily a guidance for musical chanting, the marks specifically indicate syllable stress and pauses among punctation (Wickers 1887: 1-3, 9-28). Another example is the neume system used in Gregorian chorals (Wagner 1912).

[991] The authors consider "[…] little relation to contemporary vernaculars, a possibility supported by evident bilingualism […], a conventionalized artifact of ancient, time-honored practice." Rather than the veneration of old traditions, Classic Mayan was still the actively written high variety in religious and divinatory texts (see footnote 507). Even if its orthography is closer to a copied archetype (see footnote 982), a more shallow orthography for the underlying phonology was necessary in the area of spoken Yukatekan languages.

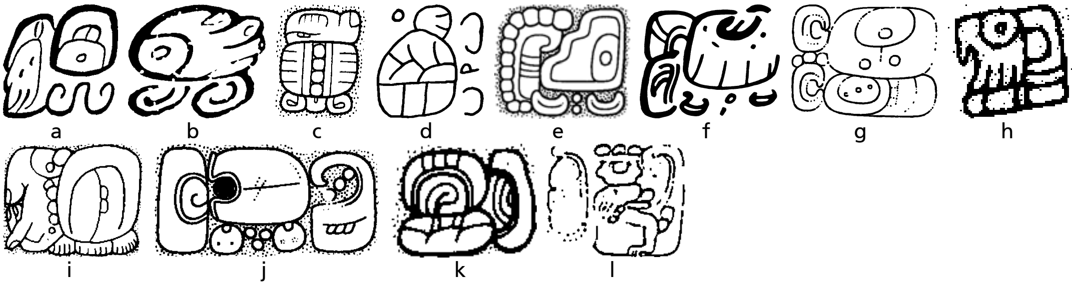

Figure 189: Synharmonic spelling patterns as deviations in the suffix domain, a: 2ANTIP, b-e: 2MED, f: 2INCH, g-l: 4TEMP. **a) jo-lo=wo** (CML U. 26, Pdt. 10, A7), **b) K'AL=ya** (COL K4960, pA1), **c) k'a-sa=ya** (PUS St. D, F12), **d) PAT=ya** (TRT Jd. 1, A6), **e) T'AB=ya** (XLM Col. 1, B5), **f) pi-ba=ya** (NTN Dwg. 65, G5), **g) ya=la=ja** (PNG Msc. Peabody, A2), **h) ye=ta=ja** (JMB St. 1, Y1), **i) ye=TE'=je** (PAL TABL, G2), **j) yi=IL-la=ja** (UAX St. 13, A4), **k) yi=ta=ja** (CRC St. 3, D20a), **l) u=tz'a-ka=ja** (YAX Alt. 22, H1).

The disharmony 'loss' cannot be examined for the root domain in this study, as empirical data are lacking. But assuming that the phenomenon also affects the traditional suffixation patterns (Table 73), these deviations can be used to partially test the assumptions for significance and find patterns in a heatmap (Figure 190) tracing the geographic and diachronic distribution. Only samples from those showcases apply that are basically disharmonic, thus e.g. excluding 1PASS, but also 3NMLS. Likewise, the samples must neglect semi-constant patterns, as among 2ANTIP. Doubtful cases, as for the putative ~ *–Vj* among 1INCH, are also excluded.

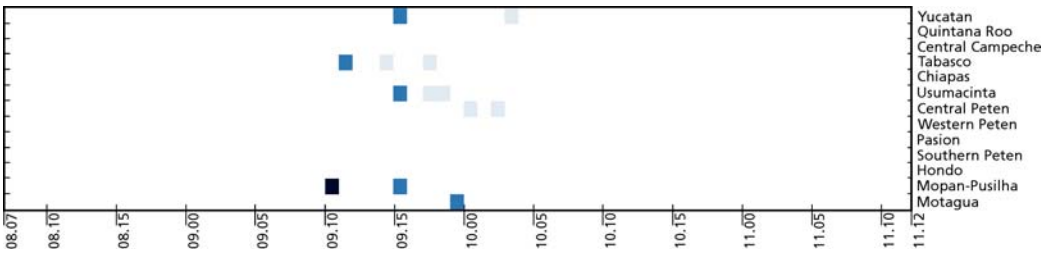

Figure 190: Heatmap of synharmonic suffix spelling alterations in diachronic and spatial spreading with N_S:=|20|. Sven Gronemeyer.

From the 3304 samples with the suffix / __# among the showcases, the constraints leave only a small subset of 22 samples (0.7%), two are not attributable to a region and time interval. The remaining 20 cases are in loose dispersion between 9.10 and 10.2, mainly in the Motagua, Mopan-Pusilha, Usumacinta and Tabasco region. Overall, the number is too insignificant to claim a continuing process of loosing the harmony rules. Two observations are nevertheless notable: 7 samples (35.0%) originate from the eastern Maya area, and 16 (80.0%) feature /a/ as the written suffix vowel (18 considering the aberrant /e/ equivalence for [ə]). That synharmony with /a/ is indication for the emergence of Eastern Ch'olan that reduces to a five vowel system (loosing /ä/) cannot be inferred with confidence. From the 21 dateable cases Houston, Stuart and Robertson (1998: 284-285) list from the root domain, 9 (42.9%) also have /a/ as the affected vowel, the earliest examples date to *K'atun* interval 9.15, and most spellings come from the Motagua and Mopan-Pusilha regions, with isolated cases from the Central and Southern Peten and the Pasion area. But generally, the harmony patterns remain very constant through time, a stable orthography also suggests that Classic Mayan was resistant to spoken language developments.

4.2.4 – Increase in Syllabic Spellings and Complementations

The question whether Maya writing followed a tendency to spell (affigated) words more with syllabograms towards the end of the Late Classic and beyond was tentatively discussed in section 4 of Chapter 3.4.2. Also compare to the data in Chapter 3.3.4 for a spatial and Chapter 3.3.5 for a diachronic perspective on the morphograph frequency and statistical data. Selected data sets are inconclusive, and merely show a qualitative increase. There is a considerable fluctuation throughout the history of text production in the Maya area (cf. Wichmann 2006b: figs. 2-3), even within well-defined units (compare to Chapter 3.3.6.1 investigating the significance of syllabic spellings in Yucatan).

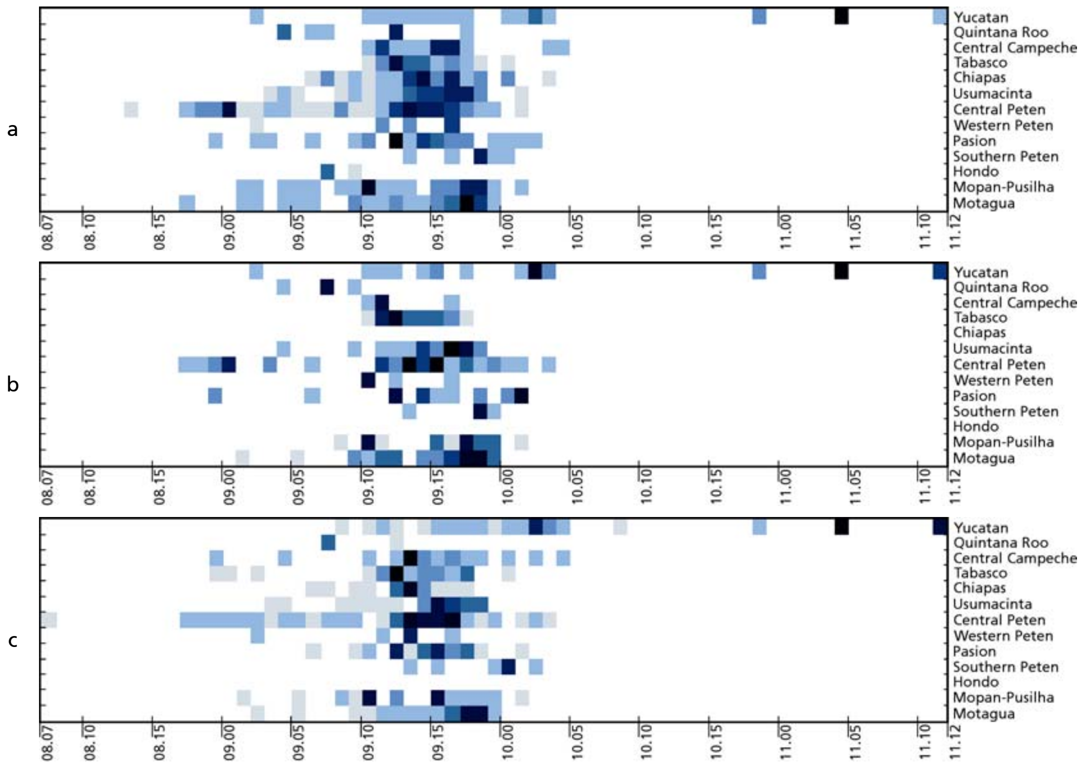

Figure 191: Heatmaps of root spelling types in diachronic and spatial distribution, frequencies not to scale. **a)** non-integrative morphographic spellings with N_S :=|1392|, **b)** integrative mixed spellings with N_S :=|391|, **c)** integrative syllabic spellings with N_S :=|998|. Sven Gronemeyer.

The intention here is thus less to determine a significance, but to isolate trends in a diachronic and spatial matrix, to identify which regions were the motors of the unquestionable relative increase of syllabic spellings and possibly find a rationale behind. Although only suffixated forms are considered, the sample set is believed to still be representative, as many lexemes can be spelled either way. With the statistically determined suffixation patterns (Table 73), I draw the following hypothesis that also connects to the Figures in Table 89 and footnote 970: syllabically spelled roots were rare when the writing system emerged and before the content rage broadened (as measurable by the lexeme diversity, see

Chapter 3.3.2). This necessitated a growing syllabogram inventory that eventually led to an increase of syllabic spellings via mixed integrative spellings, while the same conservatism as in the suffix domain retained morphographic root spellings as the scribal backbone.

A frequency distribution of morphographic, mixed, and syllabic root spellings (Figure 191) provides some explanations for the morphograph rate trend in Figure 43. Of course, the figures are determined by several factors, primarily by the showcase selection, but also by the amount of text production and text preservation. Regions with a solid amount of samples, such as Central Peten, Motagua, Usumacinta, or Tabasco are therefore best suited to test the increase. While straight morphographs overall remain the preferred way to write a lexeme (with the clear exception of the Codex Madrid, Table 70), the frequency of mixed and syllabic spellings heavily depends on the region and the timeframe. Interestingly, the intermediate set of mixed spellings features a relatively small cardinality, possibly owed to the 'economy of writing', it is not necessarily an evolutionary step in between. With the amounts from Figure 191, 49.9% of the overall samples are integrative, while the syllabic mean still reaches 35.9%.

The overall heterogeneity of the scribal mode can be exemplified by the diachronic tracing in selected regions, and eventually lead to a micro-regional definition of scribal schools. The Tabasco region features almost its entire text production between 9.10 and 9.17. Of the 423 samples from this period, 303 (71.6%) alone originate from Palenque, and we overall can define a ratio of 210:66:147 for the three spelling modes, or a preference of 50.4% for integrative and 34.8% for syllabic spellings. The sample peak of 9.12 is directly related to the abundant corpus from the reign of *K'inich Janab Pakal* with a ratio of 63:17:58, indicating an increase to 54.4% integrative and 42.0% syllabic spellings. Already one *K'atun* later, the ratio changes to 33:9:9 and the frequencies significantly drop to 35.3% and 17.7% compared to morphographic spellings. Only from 9.15 on, the trend reverts, and these three *K'atun* provide a ratio of 49:16:47, or 56.3% integrative and 42.0% purely syllabic spellings, triggered by the again increasing text production in Palenque (cf. Martin and Grube [2000] for monuments per ruler), but also Comalcalco.

Similar fluctuations can be drawn for the Usumacinta and Motagua regions, each again dominated by few major centres. But these areas again show their peculiarities. The sites in the Usumacinta basin form their largest text corpus towards the end of the Late Classic. These sites feature an increase in mixed spellings and a quickly reached plateau of syllabic renderings[992]. The Motagua valley sites especially feature a rich text corpus after the death of *Waxaklajun Ubah K'awil*, evident in the text pro-

[992] For the 17 *K'atun* intervals between 9.3 and 9.19, the samples deliver a ratio of 209:72:128, or 48.9% integrative and 31.3% syllabic spellings. The whole region shows a steady sample increase from 9.13 on, that lowers only in 9.18, with an overall ratio of 179:67:109 or 71.6% integrative and 44.3% syllabic spellings, figures significantly higher than in other regions. The figures drift even more apart in 9.18 with 12:5:17, or 64.7% and 50.0%, respectively. It is also interesting to compare the figures with individual sites in this period: Yaxchilan features 40.8% syllabic spellings, Piedras Negras only 27.3%, Bonampak 39.3%.

duction by his successors and *K'ahk' Tiliw Chan Yopat* and his heirs in Quirigua. Here, we can observe a steady increase of syllabic spellings[993].

While the relative increase of syllabic spellings is a general phenomenon, it is seemingly correlated to the corpus size at a specific place and time, but regional rhetorics is also an important influence. A comparison with the verb frequency in Figure 17 suggests that regions with a higher proportion of mixed and syllabic spellings also feature a higher amount of lexemes without a morphograph, such as *tz'ap*, *chuk*, or *a[h]k'taj*. In general, the discussed regions show fluctuations around the overall mean which variably increase in the Late Classic. But these observations would be too monocausal considering less tangible factors. It is yet to be determined if faster and more distinct applications of a more shallow orthography in different regions is related to underlying psycholinguistics (see Chapter 4.2.2.2), indicating shifts in the spoken languages forced by political and social cataclysms or migratory influences[994].

4.2.5 – Sign Classes

The concluding remarks on functional sign features concentrates on those classes that are vital for the understanding of spelling patterns in the root and especially the suffix domain. With the results from the individual showcase discussions in Chapter 4.1 and the considerations on orthographic strategies in Chapter 4.2.2, I strengthen the case for the principal dichotomy between cenemic and pleremic graphemes being sufficient for Maya writing.

[993] The overall ratio for the 24 *K'atun* intervals with samples between 8.17 and 9.19 deliver a ratio of 161:50:99, or 48.1% for integrative and 31.9% for syllabic spellings. From 9.16 on, roughly coinciding with the accession of *K'ahk' Yipyaj Chan K'awil* about three years earlier, the ratio changes to 104:28:67, thus 47.7% integrative and 33.7% syllabic spellings. With the exception of the 9.17 *K'atun*, there are in fact more integrative than morphographically written roots, e.g. in 9.18 with 55.0% by a ratio 27:9:24.

[994] Such assumptions certainly require a verification by and a correlation with material evidence from the archaeological record. Linguistically, profound changes that may have triggered such changes are supposed to have happened in certain regions of the Maya area. As the showcase discussions demonstrate, the Tabasco region has proven to be a motor of innovation and eastwards spread of WCh (and possibly already CHN/CHL) vernacular features in the script (see Figure 2), as proposed by several authors (Hruby 2002, Hruby and Child 2004, Lacadena and Wichmann 2005a, Wichmann 2006a: 282). The Usumacinta area comprises one of the major trade routes. It not only connects the Gulf of Mexico with the Southern Peten and Pasion region via its tributaries, but is also part of the 'Great Western Trade Route' network from the Guatemalan highlands with the Peten hinterland (Demarest and Fahsen 2003, Golden and Scherer 2013: fig. 4, Golden et al. 2012: 11-13). The river thus also connects regions of different spoken vernaculars, and the Late Classic Yaxchilan domestic political tensions (cf. Tokovinine 2005) may also contribute. As Wichmann (2002a) convincingly demonstrated, Late Classic inscriptions of Copan feature forms that point to the emergence of distinct CHR patterns, at a time where local nobles receive added recognition by erecting their own thrones (cf. Martin and Grube 2000: 210), from one of which the CHR *u-chum-[i]b* examples originates. The importance of syllabic spellings in Yucatan was already outlined in Chapter 4.2.2.2. A more granular review including all root spellings beyond the sampling for this study is needed to better assess the orthographic changes and the underlying linguistic dynamics in the entire Maya area.

4.2.5.1 – Syllabograms

Syllabic signs of a **CV / ʔV** structure (Knorozov 1952) represent the cenemic portion of Maya writing, they are *eo ipso* devoid of meaning when forming grapheme strings as the encoding of spoken language. As mentioned in Chapter 1.2.1.2 (see footnote 25), syllabograms may be assigned morphemic properties. But it is not an intrinsic graphematic characteristic, only an inflicted feature from the mental lexicon based on the phonemic content; it does not turn a syllabogram into a morphosyllable[995].

This is best demonstrated by free morphemes which are represented by a single grapheme either in full or by an underspelling, especially when the grapheme is not polyvalent (Figure 192). Here, the correct root coda regularly needs to be reconstructed from the mental lexicon based on the contextual embedding (see footnote 25). The meaning, the semantic domain and ultimately the correct lexeme is not provided, but needs provision by the reader based on his language competency.

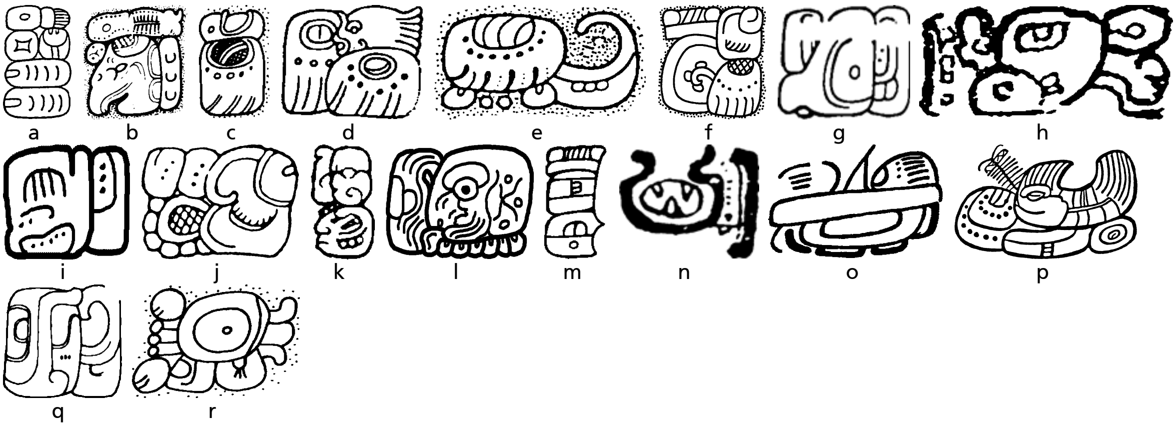

Figure 192: Single syllabograms representing a free morpheme. **a) ti AJAW=le-le** < *ti ajaw-lel* (PNG Trn. 1, H'3b), **b) ta AJAW=le** < *ta ajaw-le[l]* (TRT Mon. 6, E8), **c) a=ba** < *a-ba[h]* (PAL SCR, B1b), **d) ba ka-ba** < *ba[h] kab* (YAX Lnt. 2, Q1), **e) ba=la=ja** < *ba[j]-l-aj* (DPL HS. 2 E I, E1), **f) AJ bu=lu HA'** < *aj bu[b]-[u]l ha'* (OAG Alt. 1, H1), **g) chu=ja** < *chu<h>[k]-[a]j* (YAX St. 18, A4), **h) u=chu=wa** < *u-chu[y]-[u]* (C Dr. 2c), **i) k'a=ja** < *k'a<h>[l]-[a]j* (COL K2292, B1), **j) k'u=lu** < *k'u[']-[u]l* (CRC Alt. 12, 23), **k) mu=ja** < *mu<h>[k]-[a]j* (QRG Zoo. G, J'1b), **l) u=pe=ji** < *u-pe[k]-[e]j* (CRN P. 1, H5), **m) AJ po=lo** < *aj po[p]-[o]l* (YAX St. 18, A5a), **n) se=ja** < *se<h>[l]-[a]j* (C Ma. 108c), **o) tza** < *tza[']* (TIK MT. 4, B1), **p) ta tzi ka-wa** < *ta tzi[h]-[il] ka[ka]w* (UAX Canberra Tripod, B4), **q) tzu=ja** < *tzu<h>[tz]-[a]j* (PMT P. 1, pL5), **r) u=tz'a=wa** < *u-tz'a[p]-[a]* (KAB Str. 1A1 Panel, C2).

[995] Such notion is in accordance with an earlier statement by Houston (1997: 292), before the morphosyllabic model was developed: "The idea that grammatical logographs exist at all in Maya script is questionable. […] Rather, we will follow the more restricted notion that signs do not directly yield any morphological meaning […]. Instead, the signs record sounds that must undergo a second level of analysis – inference conditioned by orthographic conventions – for them to be understood morphologically. This is true even for the so-called ergative pronoun signs, which in many contexts clearly function as phonetic syllables (Stuart 1990a: 222). Such a feature has two important implications for epigraphers: They should not confuse sound with meaning, nor should they argue the general principle that syllabic glyphs vary in reading and morphological function according to their position around other signs. The very point about syllabic glyphs is that they no longer possess meaning […]." Compliance with this view provides an easy explanation why syllabograms can sometimes act as pleremic signs on the surface, as they provide a phonemic value that is key for the assignment to a morpheme, whether it be free/lexical or bound/grammatical.

Bound morphemes are always assigned a function on the linguistic level that is correlated with an indicating grapheme on the written level (Figure 193). In most cases, there is a one-to-one relation with =**CV** / __# < *–VC* and *–VC-V* chains, also with **V**= ~ **CV**= < *V*– ~ *C*– / __V, although there is not necessarily a phonemic congruency between the morpheme and the grapheme. Only in the instance of 2IND (at least among the showcases) does a =**CV** suffixation overspecify the morpheme, explainable by its *–V* / __# shape that would otherwise not be indicated on the graphematic level with a morphographic root, although such specific function is not attested for other *–V* suffixes, such as the imperative. With *–CVC* forms, a =**CV-CV** grapheme chain is required, thus a one-to-two relation with a full phonemic congruency (ignoring the inherent final mute vowel).

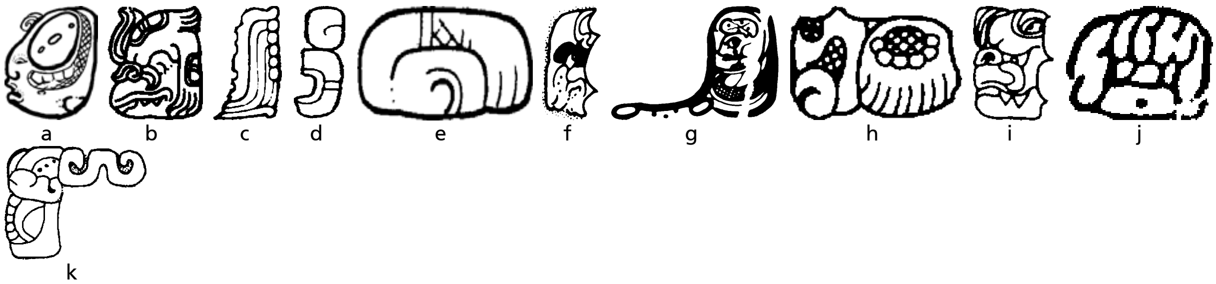

Figure 193: Grapheme-morpheme phonemic congruency in affixes. **a) =ja** / __# < *–[a]j* as -THEM (COL Shl. Taylor Limpet, D1), **b) =ji** / __# < *–[V]j* as -PRF (CPN St. J, W 38), **c) =wi** / __# < *–[V]w* as -ANTIP (DPL St. 8, H5), **d) =wa** / __# < *–[V]* as -IND (QRG St. J, A17), **e) =yi** / __# < *–[V]y-i* as –MED-COM (DPL HS. 4 V, E1), **f) =Ø** / __# < *–[i]* as -COM with **EM** (PAL TC, D7a), **g) =la-ja** / __# < *–laj* as -INTRS (PAL 96, D5), **h) =o-ba** / __# < *–ob* as –3PL.ABS (CPN St. A, G2), **i) u=** / __C < *u–* as -3SG.ERG (BPK St. 1, G2), **j) yo=** / __o < *y–* as –3SG.ERG (TIK MT. 176, T2), **k) a-wo=** / __o < *aw–* as –2SG.ERG (PAL T18S, 271a).

These permutations with graphemics also indicate that the root domain is primarily occupied by syllabograms and not morphosyllables (see Chapter 4.2.5.3) to provide (partial) phonemics. Only in a secondary instance is function indicated by supragraphematic suffixation patterns (Table 73), which originated from the graphemic lexicon inventory (see footnote 970). The regular graphemic indication nevertheless may limit the functional range of homophonous morphemes, but again not as an intrinsic syllabogram feature, as a parsed mental lexicon will attribute the correct function based on the lexical class and other factors.

The application range provides a partial assessment of the emic perception of syllabograms. They were well perceived to provide their complete CV phonemic value in all applicable environments, within a morpheme, at junctures, and across morphemic boundaries. The latter aspect is broadly investigated by the integrative patterns among the showcases, but also evidenced by vowel-final spellings such as case 2MED or the imperative (see footnote 290 and Figure 203k), where no final vowel-muting takes place. There is also a higher proportions of 1.g.i underspellings where the vowel of the suffix to follow is provided by a syllabogram when compared to zero grapheme 2.g.i and 2.g.ii cases.

4.2.5.2 – Morphographs

Graphemes of a **CVC** ~ **ʔVC** / **CVCVC** ~ **ʔVCVC** shape are labelled as 'morphographs' in this study, in contrast to the traditional 'logograph' (see footnote 15). The decision for the terminological shift is further supported by the investigation of those signs representing the pleremic portion of the graphemic lexicon, although a phonemic property may be assigned (see footnote 15).

When reviewing the grapheme – lexeme correspondence within the sample lexicon, one morphograph regularly spells the underlying root or derived stem, homophonic variations (Houston 1984) are seldom, thus we can speak of heterography (see footnote 24) when morphographs are not used for polysemy or their phonemic value. Thus, meaning or a certain semantic field, is an inherent feature of morphographs (see Chapter 4.2.1.2 and Figure 178), but it is not necessarily restricted to a root (Figure 194), as the case numerical classifiers such as =**TE'** < *–te'* or =**PET** < *–pet* demonstrate, but also the personal classifiers =**AJ** < *–aj* (see Chapter 4.1.5) and **IX** < *ix*, all of which represent a bound noun class (cf. Rijkhoff 2008). Problematic, however, remain those cases of homophony with certain levels of doubt regarding the reading, e.g. ZY1 as **T'AB** and PT4 as its possible head variant, or only being a semantic substitution (see footnote 854).


a b c d e f g

Figure 194: Comparison between polysemic morphographs as free (compounded) and bound morphemes. **a) K'UH=TE'** < *k'uh+te'*, "sapodilla" (YAX Lnt. 10, A4b), **b) ba TE'[e]** < *ba[h]+te'*, "chief of staff" (YAX Lnt. 10, E7a), **c) 4=TE' PA'-xi=la** < *chan-te' pa'xil*, "4-days [count] of *Pax*" (IXZ St. 4, B1), **d) 4=TE' SAK bi** < *chan-te' sak bi[h]*, "4-miles causeway" (CPN HS. 1 VI, 26), **e) PET-ta=ja** < *pet-aj*, "it became round" (OXK BcM. 1, I1), **f) AJ PET-ne ti-i** < *aj pet[e]n ti'*, "he of island-edge" (TRT Mon. 8, B64), **g) 8=PET AJ SUM?** < *waxak-pet aj sum?[-al]*, "8-plots [province] of Tamarindito" (AGT St. 1, D8b).

In contrast, derivational or stem-formative affixes are never realised by a morphograph that indicates the meaning of a bound morpheme. They may only appear as phonemic signs in the suffix domain together with or instead of cenemic syllabograms, as they also seldom do within roots or across morphemic boundaries (Figure 195), abrogating their corresponding meaning. Apart from those 1.e.iv spellings, the lack of **ʔVC** morphographs is also good support against the existence of morphosyllables.

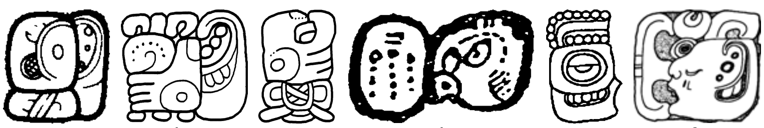
a b c d e f

Figure 195: Morphographs as phonographic signs in the root and suffix domain. **a) AK'-ta=ja** < *a[h]k't-aj*, "he became dancing" with **AK'** < *–ak'*, "to give" (DPL St. 15, E5), **b) ya-AL-la=ja** < *ya<h>l-aj*, "it was thrown" with **AL** < *–al*, "child of mother" (COL Lnt. 2 Site R, A2), **c) chi-LAM** < *chi[h]lam*, "interpreter" with **LAM** < *–lam* "to diminish" (SBP HS. 1 II, B66a), **d) K'UH-tzi** < *k'uhtz*, "tobacco" with **K'UH** < *k'uh*, "god" (C Dr. 15a2), **e) K'UH=HUL** < *k'uh-ul*, "holy" with **HUL** < *hul*, "to arrive" (SBL St. 8, C2a), **f) NAH-wa=ja** < *na<h>w-aj*, "it was adorned" with **NAH** < *nah*, "house" (PAL T18S, A5).

Another conundrum regarding morphographs concerns their polyphony with a basic **CVC** ~ **ʔVC** root value and a possible / attested lexicalised **CVCVC** ~ **ʔVCVC** form (see footnote 288). Epigraphy regularly assumes the affixation with a certain **CV** syllabogram to indicate the phonemic complement of a lexicalised form, as supported by its frequent absence (Figure 196).

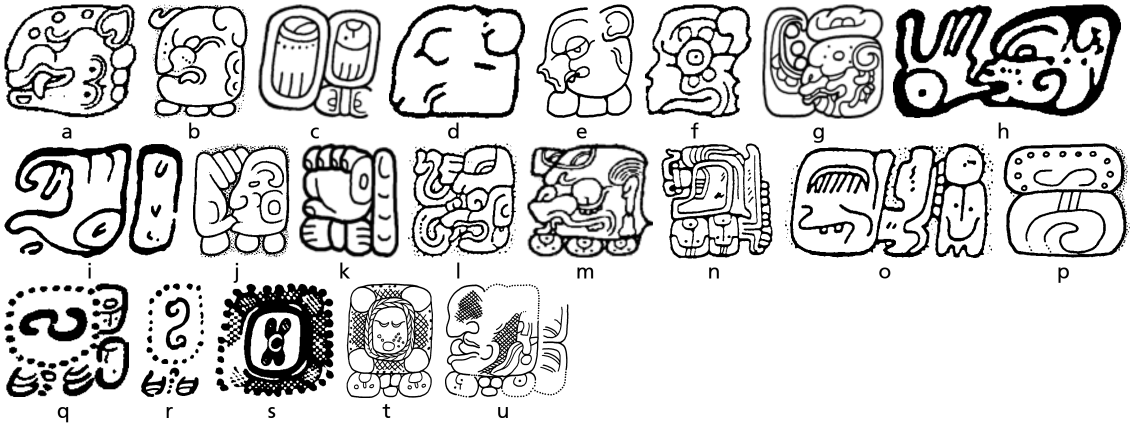

Figure 196: Root and lexicalised reading polyphony in morphographs. **a) BALAM** (YAX Lnt. 26, M2), **b) BALAM**$^{\mathrm{ma}}$ (YAX Lnt. 30, G2b), **c) ba-la-ma** (COL St. Randel, J10), **d) CHITAM** (PAL WARP, G6), **e) CHITAM**$^{\mathrm{ma}}$ (PAL PT, P9b), **f) JAN(AB)** (PAL HCHS, C11a), **g) ja-na-bi** (PAL PT, H6), **h) KEL(EM)** (COL K5509, R1), **i) ke-le** (COL K1775, K1), **j) KEL(EM)-ma** (XLM Col. 5, A3b), **k) ke-le-ma** (COL K4477, A4), **l) K'AWIL** (CPN Alt. Q, C3), **m) K'AWIL**$^{\mathrm{la}}$ (YAX Lnt. 25, L2), **n) K'AWIL**$^{\mathrm{wi\text{-}la}}$ (CHN MON-L6, E1), **o) k'a-wi-la** (CHN MON-L2, B2), **p) MUY-yi** (TRT Bx. 1, J1b), **q) MUY-ya=la** (NAR K2085, F1), **r) MUY-ya** (NAR K927, F1a), **s) PAK(AL)** (PAL 96G, C1b), **t) PAK(AL)-la** (PAL PT, C11b), **u) pa-ka-la** (PAL PT, J13).

The absence of a specific **CV** syllabogram does not necessarily pre-empt the reading as a **CVCVC** morphograph, but may simply be the result of an underspelling, e.g. in formulaic and abbreviatory cases such as a nominal phrase. As such, these syllabic signs are not a complement, but indicate a grammatical morpheme. Only the affixation with different syllabograms signals a simple **CVC** reading as the morphographic basis. As these substitution patterns are not attestable for all morphographs, it is to question whether most morphographs have only one **CVC** value, while some have a primary, or seldom secondary, lexicalised **CVCVC** reading that was not morphologically segmented any more (cf. the discussion for *ba[h]lam* by Zender [1999: 34-35]). The correct distinction is important for the lemma definition, but also for etymological considerations[996].

[996] For *bahlam*: see CHN *bäl*, "to cover, hide under" (Knowles 1984-88), *bäle'*, "abrigar, tapar, recubrir" (Keller and Luciano 1997: 42), YUK *bal*, "esconder, abrigar y encubrir debajo de algo o detrás de algo" (Barrera Vásquez 1993: 31); thus the jaguar may be a "hiding animal, hider" (Fox 1978: 163). For *chitam*: no convincing roots *chit* ~ *kit* are attested. For *janab*: see CHL *jan*, "flor de maíz" (Aulie and de Aulie 1978: 40), but also see footnote 610 for evidence for *jam*, taking an internal sandhi into consideration; thus *janab* may be an 'opener', note that **bi** is always absent in G3 (Gronemeyer 2006a: 5). For *kelem*, see CHR *kere*, "separate, divide, open up" (Wisdom 1950: 491), CHN *kel*, "to peel, skin" (Knowles 1984-88), *quelän*, "raspar" (Keller and Luciano 1997: 203), YUK *kel*, "fuerza, cosa recia y fuerte" (Barrera Vásquez 1993: 310); thus an adolescent is either 'one who opens/peels' (note the analogy to ecdysis of reptiles and arthropods) or 'one acting strong' (Houston 2009: 159), in both interpretations, we find **ma** typical for agentive suffixation, also with *bahlam*. For *k'awil*: see footnote 459, the deity may thus be the 'harvester', also see footnote 288 for rare multiple complementation. For *muyal*: see CHL *muyul*, "inclinado" (Aulie and de Aulie 1978: 60), TZO *muy*, "climb, rise" (Laughlin 1975: 245), *muy*, "ascend, climb, rise" (Laughlin 1975: 264), thus a cloud may be an 'inclined and rising thing' due to thermal lift, especially as the sign is iconographically associated with cumulus rain clouds, already on Formative monuments

To approach the emic perception of morphographs, two important observations from the epigraphic record play a major role. Firstly, sound and meaning are mutually dependent constituents of a morphograph, heterography regularly distinguishes one homophonous signified from another, a principle only seldom lifted in calligraphic 'rebuses' (cf. Houston 1984). At the same time, homography is applied for polysemic meanings, distinguishable by context or morphosyntactic embedding. Secondly, the scribes were well aware of the signifier, the phonemic content in the sense of a broad transliteration, as also emanating in homophonic writings and the phonographic use within or across morphemes.

These two observations totally rectify the terminological shift from the traditional 'logogram' as explained in footnote 15, as the semantic component is superior to the phonemics of a morphograph. To a certain degree, this sign class in Mayan writing is also some peculiar product of the 'form and sound' principle; not so much by combining a determiner and radical as in Chinese or Japanese (and to some extent in Egyptian), but by the principle of heterography.

4.2.5.3 – Morphosyllables

A profound critique on the morphosyllabic model (Houston, Robertson and Stuart 2001b) has already been expressed by several authors (Gronemeyer 2011b: 286-287, Wald 2007: 153-176, Wichmann 2006a), but mainly by epigraphic reasons. Several specific aspects are discussed throughout this study[997], and the investigated showcases in Chapter 4.1 and the orthographic strategies carved out in Chapter 4.2.2 add further reasons to critically rethink morphosyllables.

The observations made can be subsumed under several epigraphic problem areas related to the conception of morphosyllables. Their concept is specifically 'designed' to combine form and function, i.e. a specific ***CV** ~ ***VC** grapheme is attributed a grammatical meaning. In comparison with the preliminary conclusions in section 1 of Chapter 3.2.2, I continue the notion of the appliance of certain graphemes as visual reading aids (Tokovinine and Davletshin 2001). As the determined standard spelling patterns (Table 73) prove, a certain **CV** grapheme is usually tied to a specific function and therefore somewhat "iconic" similar to Robertson's (2004b: 32-33) perception of morphosyllables, except it omits allography.

(Reilly 1996). Compare the different **yV** signs in the underspelling in Figure 196r and the root spelling in Figure 196p (Gronemeyer 2006b: 28). For *pakal*: see CHR *pak*, "a fold, a roll of anything, a rolling up" (Wisdom 1950: 555), CHL *pʌk*, "doblar", *pʌclen*, "postrar" (Aulie and de Aulie 1978: 69), YUK *pak*, "coger ropa doblándo, doblar algo como ropa o manta" (Barrera Vásquez 1993: 620), TZE *pac*, "doblar como ropa" (Ara 1986: f. 81v), *pacal*, "estar echado boca abajo" (Slocum and Gerdel 1971: 170), TZO *pak*, "double over […] fold /clothing/", *pakal*, "folded (clothing, money, document)" (Laughlin 1988: 264), *pakal*, "doubled over" (Laughlin 1988: 278); thus the flexible shield may be a 'folded thing', interestingly *pakbu tun(il)*, the ClM word for "lintel" is to my knowledge never spelled with the sign XQC despite its related semantics, indicating that the valency is only **PAKAL**.

[997] See Chapters 3.2.2 [section 1], 3.3.6.2 [section 3], and 3.4.2 [section 2a] for specific considerations, Chapters 4.1.1, 4.1.6, 4.1.8, 4.1.10, 4.1.19, 4.2.2.1, 4.2.2.2, and 4.2.3.2, and 4.2.3.3 for embedded aspects; as well as footnotes 18, 27, 76, 85, 90, 106, 311, 316, 516, 573, 581, 690, 761, 762, 781, and 995.

However, there are more major differences to endorse. An indication of suffixes by syllabograms is not necessarily pleremic, but primarily cenemic, and thus only supragraphematic. As the data in Table 89 demonstrate, one grapheme may indicate several functions, as it was apparently chosen because no other syllabogram was then readily available in the graphemic lexicon. A functional attribution would also evoke the problem of polyvalency among cenemic signs, not only on a phonemic level. Together with those **(C)VC** morphographs substituting those cases where no **CV** syllabogram was yet available, this is support for a phonemic choice of graphemes, not for a connection with a specific meaning.

This reflection leads to another caveat regarding morphosyllables, the issue of consistency, which manifests itself in a variety of ways. Among the suffix spellings for those showcase with a significant constant pattern (Table 73), we find a minority of 'deviations' from the standard. While these could still be explained with the occasional replacement (not equal to a substitution) by 'ordinary' syllabograms, they would need to be considered as plain errors if morphosyllables existed at the same time. Otherwise, these deviations are nothing more than a different way to encode the same phonemic content, but possibly without any further supragraphematic information.

Morphosyllables are only proclaimed for some grammatical morphemes (cf. Gronemeyer [2011b: tab. 1] for a summary), while the studies applying their principle segregates other affixes, continuing regular syllabic spellings for them (cf. Gronemeyer 2011b: 323-327). Such exclusion is most evident for (semi-)harmonic and semi-constant patterns, such as among attributives (per design only requiring a 'regular' **LV** grapheme), or the antipassive (requiring ****WI** ~ ****WA**). If such morphosyllables were defined, they would, on a case-by-case basis, inevitably loose their constituting feature to carry meaning, as they may again become polyvalent (e.g. ****WA** already attributed to root intransitives). This quality would reach far beyond any polysemy that might, in analogy to morphographs, be a reproducible feature for morphosyllables. Consistency among non-VC morphemes (e.g. *–wan*) is also an issue, as we can observe true morphographic spellings occasionally substitution for full syllabic ones (cf. Gronemeyer 2011b: 325-326)[998].

Finally, the harmony rules and harmony pattern shifts upon affixation are concerned, and cases like **chu-ku=ja** are taken as a supporting argument (Houston, Robertson and Stuart 2001b: 23). If suffixes are indicated by morphosyllables as per the authors' functional outline, then such spellings with a synharmonic or any other original harmony pattern would more regularly be retained in the epigraphic record (see section 3 of Chapter 3.3.6.2 for data), in contrast to the abundant **chu-ka=ja**. Such perpetuation of the root harmony would truly be a shallow orthography (remembering the claimed sound inversion to a *VC* value); but is unnecessary, as the purpose of root harmony rules is abrogated upon suffixation (see Chapter 4.2.3).

[998] Lexical morphographs are rare in the suffix domain, mostly for the reasons detailed in Chapter 4.2.2.1, mainly because they have their own semantic content and would otherwise become polyvalent (as for example with **TAK** also used for the plural suffix *–tak*, see footnote 15), instead of being polysemic only (see Figure 194).

Linguistic reasons to question morphosyllables adhere to both graphematic and cognitive spheres. The graphematic argument is centred around the problem of the thought sound inversion (cf. Gronemeyer 2011b: 319-320). It is not only a problem regarding the evolution of the graphemic lexicon (see Chapter 4.2.2.1), if **CV** syllabograms indeed developed out of ****VC** morphosyllables (Houston, Robertson and Stuart 2001b: 19). A "backwards pronunciation" (Robertson et al. 2007: 4), either **CV** > **VC** or vice versa, is hardly maintainable from a phonetic point of view, as the syllable as the most fundamental unit in speech (Blevins 1995) is not separable. This view is supported by psycholinguistic studies (e.g. Read et al. 1986). As cognitive studies among other languages with a relatively deep orthography (see Chapter 4.2.2.2) suggest, no additional sign class is necessarily required to specifically indicate grammatical morphemes to support the parsing of a morpheme string by the mental lexicon and grammar. It is also to question how the differentiation between morphosyllables und syllabograms should be achieved except for the word-internal position, as the same graphemes are being used.

Although most direct evidence against morphosyllables comes from the epigraphy itself, this graphematic level is only the ostensible emanation of the underlying (psycho)linguistics. Most of this deeper cognitive reasoning can only be derived by comparative graphematics and related psycholinguistic studies. This may eventually provide further arguments not only against morphosyllables, but also for the mechanisms of Maya writing the Maya mind[999]. The Optimality Theory might also be an apt tool to further determine the sign classes used in Maya writing. While first steps have been taken to explain orthography by its principles (cf. Wiese 2004), a concise review of the overarching grammatology and writing system typology is still pending.

4.2.6 – Isographs

As defined by the study of Rollston (2006), an isograph traces the distribution of linguistic with grammatological features. Arguably, the more complex nature of the Maya writing systems apparently needs to neglect the linguistic aspect. Isographs for Maya hieroglyphs can be quite heterogeneous, and can e.g. be drawn by means of the sign inventory, spellings patterns, or morphographematics. These isolines also need to be fairly synchronous and are only reliable for the Late Classic with its high amount of texts.

[999] If the developmental sketch outlined in Chapter 4.2.2.1 is correct, continuing Grube's (1990a: 80) "proto-syllabary" argument to indicate grammatical functions, then another hypothesis might in future be tested against the evidence (a more thorough data base provided). As an impression, when comparing the inventory of morphographs and syllabograms, the latter seem to be more often right-left symmetrical. Of course, there are also many asymmetrical syllabograms, and their first occurrence in the graphemic lexicon needs to be taken into account. An examination among alphabetic writings (Wiebelt 2004) suggests that symmetry among graphemes is being reduced over the time of usage. It shapes the idea that the earliest syllabograms are also graphically distinguished from their morphographic counterparts by more symmetrical features, even more facilitating the distinction between the two sign classes and ultimately between free and bound morphemes in writing (keeping in mind the prevalence of spelling group 2). As fully phonemic spellings by syllabograms are as old as the sign class itself, this would also argue against morphosyllables. If they were to carry meaning, they would supposed to be more asymmetrical.

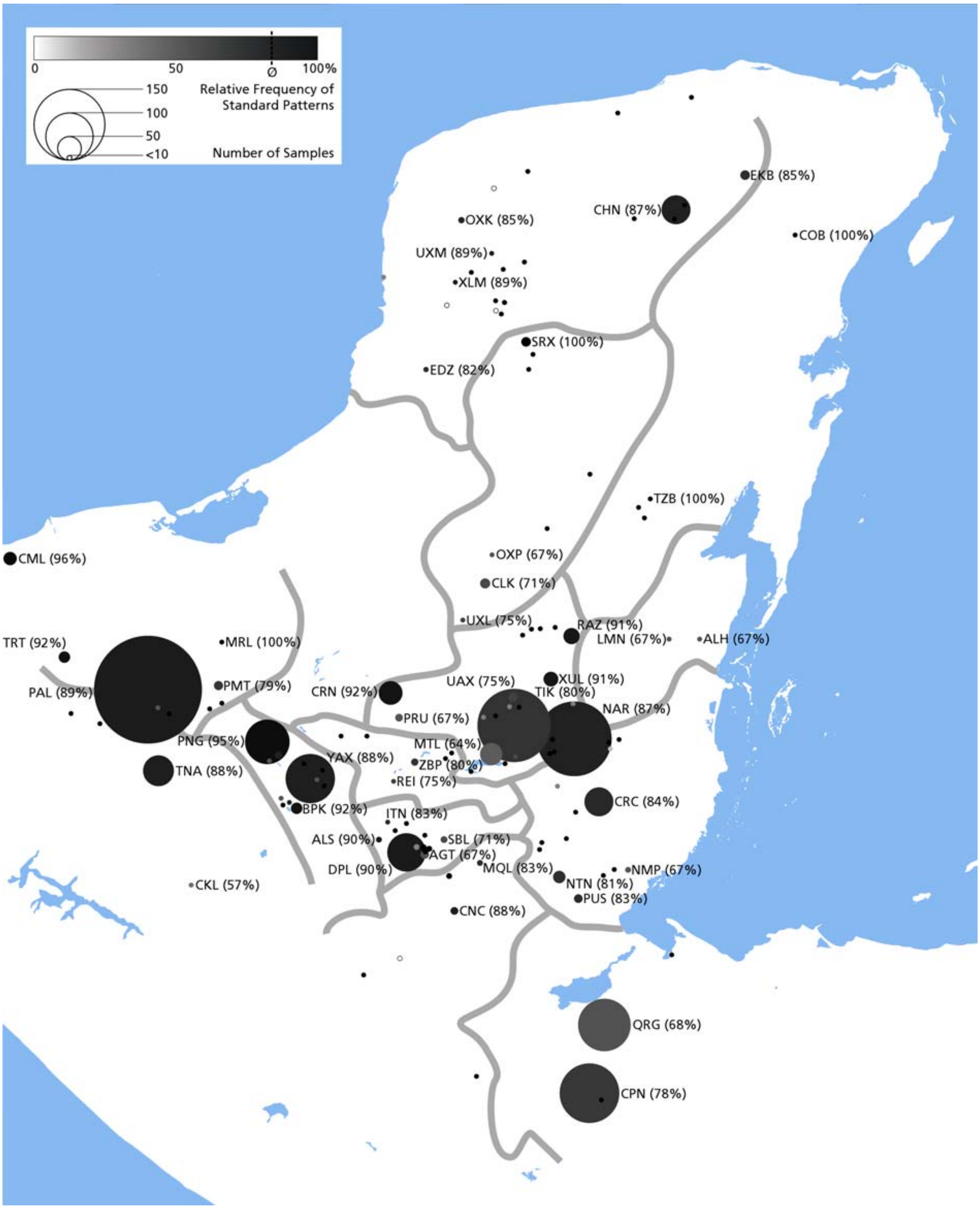

Figure 197: Charting of suffix spelling standard adherence in provenanced inscriptions with N_S :=|2059| and a mean ratio of 84.06%. Sven Gronemeyer.

In terms of the suffixations patterns as examined among the showcases, it appears to be difficult to draw isographs because of the high degree of standardisation. A more granular investigation for micro-regional features in the sense of 'scribal schools' or individual, site-specific traits is more purposive, especially on a temporal basis (compare e.g. to Figure 181 containing examples of underspellings in Late Classic Yaxchilan). In the following, three independent cases of graphematic distributions are being investigated to demonstrate the cluttered impression that is facilitated by the morpho-syllabic nature of the writing system in combination with its multitude of functional sign features.

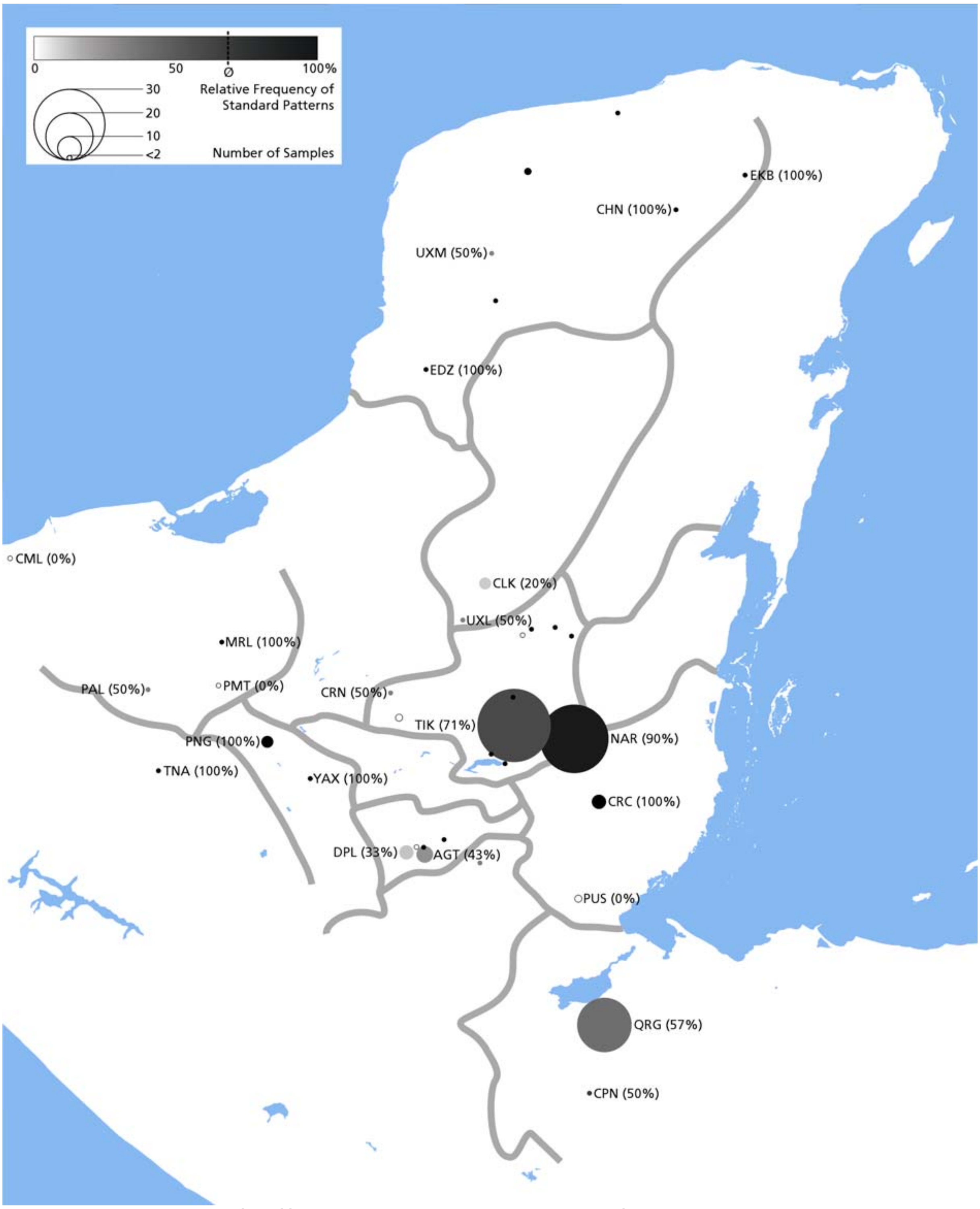

Figure 198: Charting of suffix spelling standard adherence for 2ANTIP in provenanced inscriptions with N_S :=|147| and a mean ratio of 68.22%. Sven Gronemeyer.

A tracing of the standard suffixation patterns against the deviations / __# from all showcases except 2INCH and 2COM (as being inconclusive) shows the ratio of adherence to the standard (Figure 197) from locatable inscriptions in a diachronic perspective. The picture may be distorted by regional preferences in rhetorics (see Figure 17), though; likewise all samples from unprovenanced inscriptions and the codices need to be omitted. Other factors inherent to a showcase, e.g. frequent underspellings in formulaic phrases, and the possible spelling alterations triggered by vernacular influences, are also not reflected.

The chart leaves the impression that most major sites (as per their corpus size) show less variations from the standard, while it generally increases in minor sites off major centres. The only exception is the Motagua region with a fairly low appliance of the determined standard suffixation spellings; while other suffixes and especially the harmony patterns of root spellings are omitted at all. Of course, the most extremes values (whether supporting the standard or not) are among those sites with a small sample set (10 or less); but these are more towards the standard, as expectable by the law of small numbers (von Bortkewitsch 1898). With this impression, the major sites act as 'barycentres' for isographs tracing the overall orthographic standard compliance, as far as the showcases are concerned.

Breaking down the spelling standard variability to individual showcases, the picture is likewise somewhat inconclusive. It is demonstrated by 2ANTIP (Figure 198) as a case with a rather high diversity, but ignoring the cases of underspellings. Tikal, Naranjo and Quirigua feature a high amount of samples because of the frequent notion of antipassive ruler names. Otherwise, the ratio of standard patterns within a site deviates considerably from the overall mean values of all showcases in Figure 197, without any recognisable geographic pattern.

Apart from orthographic conventions, another way to define isographs is the graphematic or graphotactic variability. A graphematic perspective primarily consider the distribution of and preference for allographs, e.g. for APC, 1M1, and 33F **ji** among showcase 4TEMP (Figure 199)[1000]. Generally, 33F is the most common allograph, with 1M1 and APC following. As a result, the grapheme use varies around these values in many sites, with a tendency to balance between 33F and 1M1, as for example in the Motagua region. Other areas, such as the Central Peten and particularly Tikal, make more prominent use of 1M1 than 33F; but also sites elsewhere, such as Tonina. Palenque, on the other hand, still uses 33F most often, but prefers APC over 1M1. For 33F, two areas can be delimited: it is very prominent in the Pasion region, e.g. being exclusive in Dos Pilas; and above all it is the only allograph applied in the texts of Yucatan.

Some other interesting showcases fall apart, for example the allographs of **bi**, as many examples come from looted ceramics without provenance. Cases of single sign variants, such as ZU1(1) and ZU1(2) **ja** are more difficult to assess, as their choice is more conditioned by spatial requirements within a block. But again, regional or site-specific inclinations towards block-internal arrangements might be observable even on such granular level. Here, graphematics already interferes with graphotactics.

[1000] The variability is colour-coded by the CMYK model, with 100% APC = 100/0/0/0 (cyan), 1M1 = 0/100/0/0 (magenta), and 33F = 0/0/100/0 (yellow). All ratios between the three allomorphs represent a certain position on an additive chromatic circle (as polar coordinates) and gradient between these three values.

Graphotactic variability is not only a question of representational rules, but also the appliance of the graphemic lexicon, particularly the choice of how to assemble a grapheme string based on the functional sign classes. Chapter 4.2.4 already discussed such aspects with the distribution and development of group 1 and 2 spellings as charted on a more macroscopic level in Figure 191.

Figure 199: Charting of the graphematic suffix spelling variability of 4TEMP in provenanced inscriptions with N_S :=|351| and a mean ratio of APC/1M1/33F = 10/29/61%. Sven Gronemeyer.

As the three snapshots demonstrate, it is relatively futile to concentrate the tracing of isographs on singular and decoupled features. Only a combined, multivariate analysis is able to allow the definition of scribal preferences; but possibly only on a small-scale level. Such features do not necessarily need to be part of a geographic continuum, as sites may occupy a position of 'exclaves' for certain preferences. With the impression of the charting of features from showcases 2ANTIP and 4TEMP, the totality of orthographic variability is rather cluttered, but also needs to consider further parameters not considered here, such as the time of use for certain graphemes. Only in terms of the standard spelling pattern adherence, there seems to be a clear tendency, apart from the actual graphematics. Major centres comply most, as their courts can afford to engage the best trained and most virtuosic scribes.

4.3 – Linguistic Discussion Conclusions

THIS STUDY IS CONCERNED WITH orthographic conventions, but also their possible contribution to the reconstruction of the ClM language. It does not only concern the morphosyntax so intimately tied to the showcase definition, but also phonetics, the vocalisation and sound of an extinct language. Of course, this insight is not only one of curiosity, but tangles several important questions: (1) the set of alloforms for one morpheme, (2) the degree of homophony with other morphemes, and (3) questions of language development and affiliation. In the spirit of the holistic approach to understand the mutual dependency of the spoken and written word, this chapter discusses several insights from the epigraphic analyses and seeks to synthesise them to better understand the language situation of ClM.

Taking the individual showcase discussions from Chapter 4.1, the concluding linguistic discussion pursues to extract general linguistic features for ClM. These are not only of interest for the linguist, but are again considered as support for the epigrapher to better judge orthographic conventions and the underlying mechanisms of the writing system. In this sense, the synthesis again pre-empts prescriptive aspects of grammar (see Chapter 2.5.3.1).

Several aspects are of particular interest. The definition of phonologic and morphophonemic rules for ClM is key to judge orthographic realisations and thus to answer the question whether the writing system was primarily analytical or pursued a phonemic rendition of the spoken language. That ClM was without severe doubts a prestige language (see Chapter 2.5.4 and 3.2.2[3, 5]), a high variety used for courtly matters and particularly (only?) for writing, besides a multitude of common low varieties spoken in different regions of the Maya area. As such, two other areas are affected: (1) the manner of speaking, the discourse structure, the rhetorics of hieroglyphic texts, and the pragmatics; and (2) the percolation of low variety vernacular traits into ClM. Both can be viewed under sociolinguistic aspects, and the latter is also intimately tied to language geography and dynamics and the genetic affiliation within the Ch'olan and, more generally, the Western Mayan branch (see Chapter 1.2.2.3). As a last question, such vernacular features may help to trace isoglosses and calibrate reconstructions from historical linguistics with epigraphic data.

4.3.1 – Phonology

Although it is one declared intention of this thesis to utilise graphematics as a medium to reconstruct the ClM phonology, the individual showcase discussions and theoretical deductions demonstrate the difficulties involved. Thus, many of the ideas brought forward need to remain mere postulations that base on few linguistic data, paired with some 'general inferences' of the phonology of Mayan languages. This is not necessarily a scientific approach, but facing the lack of data to build solid hypotheses on, it is at least some thought play to draw attention for future research. Nevertheless, some concluding remarks may be provided.

4.3.1.1 – Phonological Properties

Not only can spellings be used to obtain a deeper understanding of the ClM morphosyntax, but also its phonology. We can try to evaluate the orthographic depth of Maya writing between the two extremes of being analytical (more reflecting the underlying morphology) and being phonemic (more reflecting the sound of the spoken language that was recorded). As outlined in Chapter 4.2.2.2, the impression is more towards the analytical spelling, and thus in accordance with the majority of writing systems, trying to retain the morpheme identity (and partly semantics) on the graphematic level (cf. Venezky 2004). This notion is also supported by the two different sign classes applied (Chapter 4.2.5) that foster a deep analytical orthography superior to a shallow, syllabic spelling that may record each sound. But it is still not truly phonemic by not recording different allophones by distinct graphemes, but possibly by other means.

While a revision of the syllabic matrix to distinguish /h/ and /j/ (Grube 2004d) has found broad acceptance with numerous minimal pairs identified beyond range of the original study, an approach to discriminate graphemes for vowel quantity (Wichmann 2002b) yielded no satisfactory evidence or substitution patterns. The persuasion uttered in this study that ClM still retained the pCh six-vowel system and featured qualitative vowel hierarchy (see Chapter 4.2.3.1) likely still would not alter the syllabic grid. If such distinctions are indeed made, they are possibly indicated by the supragraphematic property of harmony patterns.

Even the distinct vowels /a/ and /ä/ are, per the current understanding, not discriminated by different graphemes. However, examples supporting their existence in ClM are frequently found (see Chapter 4.2.2.1), or at least this is indication for an allophonic distinction in certain environments. With the inferences from the epigraphic evidence and the reconstructions made for pCh (Kaufman and Norman 1984), I propose to revisit the hieroglyphic transcription and streamline it with the historical linguistic evidence. The transliteration of **u=ma-ka=wa** (MQL St. 5, A3) should then rather be

u-tz’i[h]b-ä*, **u=tz’i-ba (K578, B1) be **u-mak-ä-Ø*, or **ye=te=je** (PAL TABL, G2) be **y-e[h]t-äj* (with the putative derived transitive **e[h]t-ä*, see footnote 942). In fact, a better understanding of the orthographic conventions of Maya hieroglyphic writing needs to come from a phonological reconstruction of pCh and ClM likewise, based on the modern Ch’olan languages; and not just a phonemic reconstruction (see Chapter 5.2).

The same holds true for ClM syllabification and stress patterns that also trigger morphophonemic processes (Chapter 4.3.1.2). The canonical paradigm derived from the syllable structure (see footnote 30 and Chapter 1.2.2.1), predicting that a CVC syllable is always last and a CV syllable is not parenthesised by CVC syllables, is sometimes ‘violated’ by morphological requirements, as discussed in the individual showcases in Chapter 4.1. These environments are scarce, though: (1) among vowel-final forms, such as transitive verbs (e.g. *[ʔu.t͡ʃu.ku]), the mediopassive (e.g. *[t͡su.t͡su.ji]), the completive of intransitive verbs (e.g. *[hu.li]), or the imperative (e.g. *[ʔuh.t͡su]); (2) certain *–VC-VC* chains that do not syncopate (e.g. *[t͡s’ihb.na.xak]); and (3) certain *–CVC-VC* chains (e.g. *[pat.wa.nij]). Nevertheless, there is apparently a tendency to force affigated forms into the paradigm, as demonstrated by the vowel syncope of *–VC* suffixes or bisyllabic stems.

While these rules of syllabification are likely true for Ch’olan and thus ClM forms, deviations may regularly occur in vernacular contexts, as discussed for the Tzeltalan formation of intransitive positionals (Chapter 4.1.2). Moreover, these examples may also become subject to code-mixing when taking the temporal deictic enclitic. Mayanised loan words (see footnote 36) are also not necessarily applying to the canonical scheme, although a phonological assimilation took place.

4.3.1.2 – Phonological Processes

As the previous chapter suggests, the correct identification of the underlying phonology by means of epigraphic patterns is already an error-prone task. It may easily lead to completely different understandings based on the same data set, as for example the ClM vowel system based on harmony patterns. Even more difficult to assess are morphophonemic processes in the language of the hieroglyphs. These may or may not regularly appear and are often conditioned by additional constraints, compare to (non-)syncopation among instrumentals (Chapter 4.1.17) or the subjunctive of derived transitive passivations (Chapter 4.1.1). As also pointed out previously, the tendency to for an analytical, deeper orthography does not always allude to the correct pronunciation.

The most obvious example is the passive <*h*> infix of root transitives (Chapter 4.1.1) that barely finds a glyphic indication, as it would require a root-internal overspelling. Thus, the inferences for the <’> and <Ø> allomorphs must solely rely on the comparison of general phonological features in the Ch’olan languages; even more they are not described for CHR as the only language still preserving this passive formation, but inferred from the CHL pattern. More overt are spelling changes at morphemic boundaries that only become explainable by morphophonemic processes, such as the preference to harmonic alterations to indicate syncopation (see Chapter 4.2.2.1), while preserving the morpheme identity at the same time. But a vowel syncope is not necessarily indicated by an orthographic rule, especially when affecting the second stem internal vowel (see footnotes 663 and 681), or the stem is represented by a morphograph.

Sound changes such as lenition or dissimilation are likewise difficult to argue for, also including a diachronic perspective. The spelling patterns of the inchoative of *sih* (see Chapter 4.1.3) with or without **ya** are a case to argue for a lenition *[si.hax] > *[si.jax] beginning in the Early Classic, but also for assimilation after syncopation (*[si.xij] of an underlying ***sih-j-Ø=iy*), when taking the temporal deictic enclitic. Vowel dissimilation may also apply for the *–i* thematic of mediopassives (Chapter 4.1.12) to still explain a canonical syllabification, especially when considering the tendency to suffix =**ya** with CaC roots to reflect root vowel assimilation, e.g. *[t'ʌ.b'ʌjᵊ]. Otherwise, assimilation is widely attested as an underlying process of *–VC* suffixes following *–CV* morphemes (e.g. *[pat.buj] of an underlying ***pat-bu-Vj*).

More data on the morphophonemics of modern Mayan languages, would ultimately be needed to allow a backwards reconstruction for ClM. With such guidance, certain spelling patterns might become explainable as the more phonemic way of writing, as opposed to the standard analytical orthography. Moreover, the epigraphic data might help to calibrate such phonological processes from historical linguistics. It is thus a request to linguistics to provide such data for epigraphy.

4.3.2 – Morphology

Conclusions about the ClM morphology and morphosyntax have to turn out less concise in the linguistic discussion of a study primarily dealing with the orthography and phonology of suffixes. However, as the investigation also includes the functional determination of suffixes, necessary to exclude homophonous morphemes, several points can be discussed in terms of morpheme identification and relation to syntactic requirements.

4.3.2.1 – Morphological Observations

The epigraphic discussion of the showcases primarily confirmed all linguistic assumptions made beforehand, specifically with regard to the suffixes proper and the Ch'olan affiliation of ClM (see Chapter 4.3.5). One typical marker is the mandatory intransitivation of transitive and positional roots before nominalisations, as first outlined by Wichmann (2002a: 11-15). The attestation of current WCh and ECh morphological features, such as the *–Vy* versive or the *–C-aj* inchoative, further strengthen the ClM high variety use in writing.

Although ClM, as all Mayan languages, exhibits a strict set of rules of how to form morpheme strings (see below), it reveals a large productivity of derivations at the same time that occasionally surfaces apart from a formalised style (see Chapter 4.3.3). Productivity is furthermore increased, although to a limited extent only, by the fact that sign classes may merge, as attested for transitive and positional roots (Wichmann 2002a: 7-8). The showcases especially contribute further facets to the morphology of complex expressions, particularly the derivation of nominal compounds, involving the –Ø nominalisation of verbs (see Chapters 4.1.3, 4.1.9, and 4.1.14). However, not all instances that epigraphically appear as compounds are ones linguistically, and yet other instances, such as the 'positional compound' remain unsolved. It does not only require a comparative linguistic approach, but also a large number of substitutions in the epigraphic record, paired with different syntactic embeddings of a form to derive its internal morphology.

The scrutinising of compounds also has broader typological implications, as the constituent order in compounds shows a close relation to syntax (cf. Gaeta 2008), thus the compound nature proposed for **yi=ta HUL** by MacLeod (see footnote 494) is barely possible in Mayan. In fact, all samples discussed always feature the nominalised verb in first position, reflecting the VOS word order. The same is observable with the object incorporating antipassive (Chapter 4.1.10), where the object follows the detransitivised verb.

4.3.2.2 – Morphosyntactical Observations

Two important dependencies in relation to the word-internal syntagma can be tangled: (1) the position of suffixes in relation to the root or stems (Table 91), and (2) the constraints not only depending on the morphosyntax, but also the syntagma. One example is the suggested facultative application of the *–Vl* possessive suffix in predicative position (at least following the instrumental, see footnote 914).

Showcase	**Base Morpheme**	**Positions / Dependencies**		
		+1	**+2**	**+3**
1PASS	*-aj*	/ (C)V(<h>)C-__	/ (V)CVC-C-__	
1MED	*-aj*		/ (C)VC-C-__	
1POS	*-aj*	/ CV<h>C-__		
1INCH	*-aj ~ -Vj* (?)	/ (CV)(C)VC-__		
1ABSL	*-aj*	/ (CV)(C)VC-__		
1POSS	*-el*	/ (C)VC-__		
1ATTR	$-V_1l$	/ (CV)(C)VC-__		
2IND	$-V_1$ ~ *-V*	/ (CV)(C)VC-__		
2ANTIP	$-V_1w$	/ (C)VC-__		
2MED	$-V_1y$	/ (C)VC-__		
3INSTR	*-Vb*	/ (C)VC-__	/ (V)CVC-C-__	
3NMLS	*-el / -ol*	/ (C)V(<h>)C-__	/ (C)VC-C-__	
4TEMP	$-V_1j$	/ (C)VC-__	/ (V)CVC-C-__	

Table 91: Position dependencies of the showcases suffixes in a morpheme string (ignoring morphophonemics).

The listed dependencies are generalised, but still exhibit a restricted rule set for ClM, and can, enriched with further structures, possibly be described following the theoretical framework of a Lexical-Functional (or Constituency) Grammar (cf. Kaplan and Bresnan 1982). As such, it would be helpful for a comparative study among Ch'olan and other Mayan languages. Furthermore, such models (based on the totality of morphemes attested) can be utilised for typological studies of agglutinative or polysynthetic languages, also in relation to the word order of VOS languages (Keenan 1978), going beyond the constituent order of compounds (Gaeta 2008). A relationship between affix order / position and syntax has barely been investigated (cf. Comrie 1989: 216-218), while more studies deal with morpheme level ordering (cf. Badecker [1991] for a discussion). There are at least indications for the word order in relation to the verbal complex and tense marking (e.g. Ouhalla 1991, Siewierska 1994).

The benefit of such discussion would reach far beyond descriptive models. When viewed as part of a 'generative grammar' in a Chomskyan tradition, as many of the mentioned studies do, an approximation to a formal hierarchical description (cf. Chomsky 1956) might be possible. The data may as well be applicable for testing against other theoretical models, e.g. the Dependency Grammar (cf. Tesnière 1959) or Optimality Theory (cf. Prince and Smolensky 1993). More that typological studies may benefit from (Classic) Mayan, the opposite case is true, and a better typological understanding supports the epigrapher in the analytical process.

More concrete, morphosyntactic features adhering to Ch'olan patterns are confirmed among the showcases, but are otherwise largely omitted in this study. When ignoring the vocalisation and simply judging after the suffix's morphosyntactic properties, it is occasionally difficult to conclude the language affiliation, as all Greater Lowland languages share certain characteristics regarding suffixation position dependencies. Only the Greater Q'anjobalan branch diverges in certain respects, e.g. joint preposed person marking of transitive verbs (e.g. Hopkins [1967a: 117-118] for CHJ), similar to Eastern Mayan (cf. Kaufman 1994, A 1: 22-23). In terms of the identification of particular languages by the morphology, see Chapter 4.3.4 on vernacular influences. Yet, many issues related to the ClM morphosyntax remain unresolved, as for example best demonstrated by the discussions on tense and aspect marking (cf. Robertson, Houston and Stuart 2004, Sanz González 2006: 411-652, Wald 2000, 2007: 522-801).

The syntagma is not reviewed, as it barely affects the orthography of morphemes, nor their pronunciation. However, the showcases were able to discuss some syntactic peculiarities that may serve to determine the suffix function, such as relative clause construction among agentive antipassives (see Chapters 4.1.10 and 4.1.11).

4.3.3 – Rhetorics

While the investigation of pragmatics and the rhetorics of ClM texts has no affect on the orthography or phonology of grammatical morphemes, it is directly connected to the statistical figures. The preference for a certain mode or voice directly influences the cardinality of a showcase sample set, at least for certain expressions. Furthermore, a diachronic perspective may reveal shifting patterns in style and possibly also in underlying social phenomena.

The inscriptions apparently tend to prefer an impersonal voicing, focusing on the patient. At the same time, the semantic agent often remains unnamed or is omitted after a first mention. This is best demonstrated by the high amount of passive examples opposed to transitives in active voice (compare Figures 24 and 32). This is in accordance with the Mora-Marín's (2004b) observations that the preferred argument structure is with verbal forms of one valency. A direct comparison of the two voices (Figure 200) exhibits about twice as much samples for the passive, with a more or less constant ratio over time.

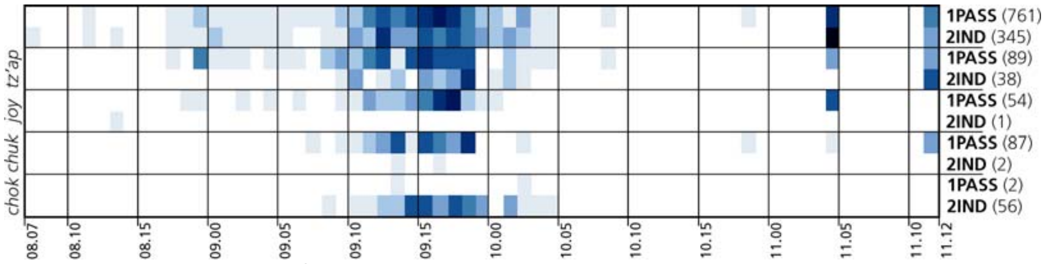

Figure 200: Heatmap of active and passive verbs with selected lexemes in diachronic development. Sven Gronemeyer.

When breaking down the comparison for selected verbs, the general trend for passive voice is confirmed for almost all of them. Only *tz'ap* shows a small qualitative increase by the very end of the Late Classic, thus putting the ruler as the actor more into focus. While the impersonal, object-oriented rhetorics is prevalent, certain expressions like *chok* are exceptions to the rule. Variation between different single-argument forms is possible to a certain degree even within the same text, compare to 1PASS *balun ip-n-aj-Ø* and 1INCH *balun ip-aj-Ø* on PAL T14T, F2 and A6.

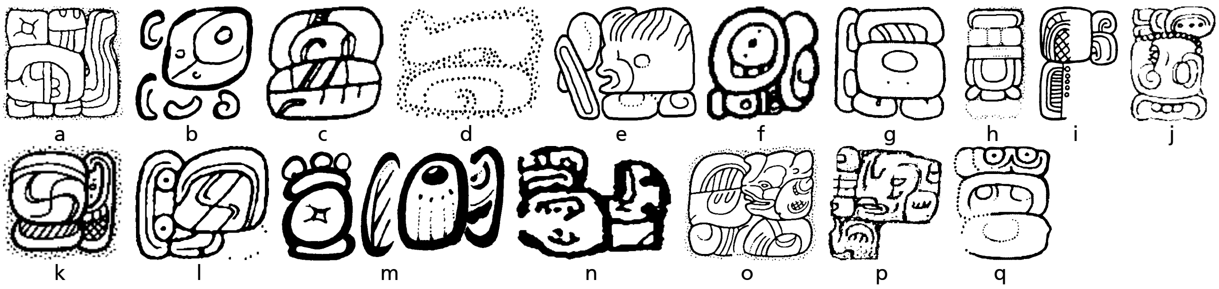

Figure 201: Examples of untypical affixation patterns and rhetorics of certain lexemes. **a) AJAW-wa=ni** (PAL TI-W, F12), **b) ya=la=wa** (K671, T4), **c) yi=ta** (COL St. Hauberg, D1), **d) CH'AK=yi** (IXK St. 4, A2), **e) CH'AK-ka=wa** (SBP HS. 1 I, A33), **f) ja-tz'a=yi** (COL St. Nil Sajal, A16), **g) u=ka-ba=wa** (QRG Alt. O', J'6b), **h) u=LAM=wa** (MQL St. 2, K5b), **i) pa-sa=wa** (QRG Mon. 26, C5), **j) siSIH=na** (PNG St. 11, Bp21a), **k) TZ'AK-ka=ja** (CNC P. 1, L5), **l) u=TZ'AK=wa** (NAR St. 23, F21), **m) tz'a-ka=ba=ja** (RAZ K2914, W1-X1), **n) tz'a-pa=wa** (C Pa. 3c), **o) i u-xu-lu=yi** (COL P. Emiliano Zapata, D1), **p) u-xu-lu=k'a** (TIK Bn. Mundo Perdido, A1), **q) STAR.WAR=ja** (PNG St. 12, D13a).

The higher amount of incorporating antipassives in contrast to absolute cases is additional support for a preferred argument structure focusing on the patient. But antipassives are still less frequent opposed to other diatheses demoting the syntactic agent[1001]. However, impressions inferred from the sampling are pending another empiric and statistical analysis and require a broader data base involving complete clauses.

More in the interest of this study's scope are two patterns of exception: (1) cases of a style deviating from the 'standard', and (2) affixations not coherent with the lexical class. The latter case is prominent with transitive verbs featuring positional marking (Figure 106), possibly as a result of merging lexical classes (Wichmann 2002a: 7-8) and exhibiting a particular semantic aspect related to the action. Attestations of a lexeme, particularly verbs, with a rare affixation or derivation (Figure 201) pertains more to the domain of pragmatics.

Noteworthy are those examples of transitive verbs that appear in plain indicative mode (Figure 201c, g), while they normally occur in perfect aspect in secondary position[1002]. Such instances apparently either apply a deviating discourse structure, or a follow a different syntagma when the statements are considered as two separate clauses and not as a complex sentence[1003]. Of particular importance are cases, where the standard affixation is replaced by a functionally equivalent, alternative derivation, particularly a vernacular form, such as the *–Vn* inchoative (discussed in 4.3.4.2), e.g. *sih-[i]n-Ø* (Figure 201j) instead of *siy-aj-Ø* as the ClM form.

It is therefore of special interest to scrutinise regional and temporal preferences in rhetorics and style, as such differences are important indicators for language development and geography; but also to determine specific 'schools'. An example is the indicative *y-il-a-Ø* that almost exclusively appears in Early Post-Classic northern Yucatan, as does *pu<h>l-aj-Ø* instead of the regular mediopassive; although such shifts are still limited. A careful distinction between migrated vernacular influences into the ClM high variety must be made to 'genuine' vernaculars that percolate into writing as the regionally spoken language. An example for the first category is *–wan* as the WCh intransitive positional

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[1001] Compare to Figure 133 for selected lexemes. One case is *ch'ak*, which, apart from nominalised cases (e.g. Figure 108d-e), almost exclusively appears in passive voice. Only one instance of a mediopassive *ch'ak-ay-i-Ø* (Figure 201d), while no transitive case is known. I do not think that the case in Figure 201e is an underspelled *–w-aj* passive (Grube, Pallán and Benavides 2010: 286), as *ch'ak* is a root transitive verb, hence **=wa** must be plain object-incorporating antipassive. Similar constructions are seldom known with other verbs, e.g. *tz'ap-aw-cha[h]k-Ø* (Figure 201n) and *tz'ap-aw-tun-Ø* on UXM St. 2, J3.

[1002] These examples have to distinguish between instances, where the typical secondary verb indeed appears in primary position, and those, where the secondary verb is not in perfect aspect. Following direct speech, *al* is always in perfect aspect; three cases of indicative mode appear as part of direct speech (on MTL K793 followed by *y-al-aj-Ø=iy*), e.g. **a-LAY**^{ya} **SAK tzi-ma wa=la=wa hi** < *alay sak tzima[h]-Ø w-al-a-Ø hi*, "this (is) white gourd, (as) I said it" (K7727, Q1-Q5). Other cases are less clear, *it-a* for example is in plain status with **yi=ta** on NAR St. 13, D5, as it follows a copula-less stative sentence and precedes *y-il-aj-Ø* in D10 as the secondary statement, likewise **yi=ta** on CPN Alt. Q, D4 follows a stative expression and directly precedes **HUL-li** < *hul-i-Ø* as a completive verb. As per MacLeod's (2004) paradigm, the secondary information is linked to the first by simply adding a new information. Different is **yi=ta** on TIK Marcador, D2, where it appears in secondary position (following *hul-[e]y-Ø* in B7), but binds two new arguments, stating that *Sihaj K'ahk'* accompanied *Jatz'om Kuy* – thus, the verb is indicative. Also compare to **yi=IL**^{li}**=ji** < *y-il-[a]j-Ø* (UXL St. 12, B7) and **yi=IL=wa** < *y-il-a-Ø* (UXL St. 13, B6) that appear in identical contexts, but apparently apply a different discourse structure.

[1003] Compare to the example in footnote 940. It appears that the Distance Number between the completive first sentence and the perfect second one works as some sort of conjunction, hence we could translate as "[…]the older brother person youth *K'inich Je Ok* was going (to) *Chik Nahb*, (and/because) six days later […] *Yuknom Ch'en* II has announced him (as) *Kalomte'*." The secondary perfect clause thus is always part of a complex sentence, also see footnote 819.

marker (Hruby 2002, Hruby and Child 2004), for the latter it is the Yukatekan completive *–ki* suffix (García Campillo 1996, Lacadena and Wichmann 2002: 286) among intransitive forms (see Chapter 4.3.4.1).

Apart from historiographic considerations, 'regional' (Stuart 1995: 118-133) and especially literary genres that have been outlined in Chapter 3.3.2, a study of the rhetorics of hieroglyphic texts is not only valuable for quantitative linguistics. Text genres are not only a device to investigate pragmatics and a narrative discourse (e.g. Lacadena 2009), but are also intimately connected to different formal layers of language, i.e. syntax, semantics, and morphology, especially in a diachronic perspective.

4.3.4 – Classic Mayan Language Geography

The description of a ClM language geography comprises both a spatial and a temporal perspective and can be achieved by different layers of language, e.g. on a lexical or morphological basis, as conducted by numerous previous studies (cf. Houston, Robertson and Stuart [2000: tab. 1] for a summary). As this study applies several showcases of affixes, a discussion of language geography must here rely more on grammatical features than on lexical evidence. Furthermore, as the showcases *per se* represent a standard ClM morphology, their vernacular peculiarities are more of interest, likewise affixes of identical function from outside the showcases (although collected only in an unsystematic way). To a lesser degree, as it is not a main focus of the study's objectives, some preliminary considerations can be made of how to distinguish vernacular suffixes with a different pronunciation from the ClM form. And although lexical vernaculars are largely omitted, their mapping can be helpful to define areas of diglossia, e.g. Yukatekan roots (such as *bot'*, *sel*, or *tok*) that are affixed with ClM morphemes.

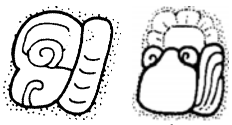
Under the assumption that any of the ClM morphemes selected for the showcases may find a vernacular form recorded in the texts, Chapter 3.1 not only compiles the evidence from the Yukatekan, Tzeltalan, and Greater Q'anjobalan languages, but also hypothesised on possible spelling patterns to search for during the sampling. However, while some forms feature a more a less strong trait in the epigraphic record (such as the Tzeltalan <*h*>…-*aj* intransitive positional in Tonina), others may not be represented at all (e.g. the Tzeltalan *–ot* / *–ey* passive). From outside the Ch'olan branch, Yukatekan vernaculars leave the most prominent mark in the corpus. The intensity of vernaculars, their entropy within the ClM high variety, is triggered by several factors: (1) the quantitative probability (compare to the Zipf distribution in Figure 15 and regional genres in Figure 17), (2) the reflection of regionally different socio-linguistic processes, and (3) the sujets of the texts written whose degree of formality may prevent a larger influence of low varieties. The absence of certain vernaculars in the corpus does not mean they were not present in a diglossia situation among the spoken language(s), the preferred rhetorics just did not provide the occasion to commonly hand them down via the epigraphic record. Still, singular occurrences may always appear, as for example the cases in Figures 202 or 203j.

Apart from those vernacular forms pertaining to a showcase (such as the *–C-aj* mediopassives and inchoatives, the singular Ch'orti' *–ib* instrumental in Copan), this chapter further elucidates spellings that either securely or potentially represent a low variety influence in writing. These examples (providing their contemporary date) – merely a snapshot from the record – are discussed on a linguistic basis, while their broader implications on the ClM language affiliation and isoglosses are discussed in subsequent chapters.

4.3.4.1 – Secure Vernacular Spellings

A vernacular spelling in the corpus can be considered as proven, if the linguistic and morphological analysis leaves no other option but to consider a form that is not compliant with a ClM scheme. Many of these cases have already been discussed in the literature and found a broad acceptance from a genetic point of view, although the exact analysis may still be problematic.

In addition to the showcases, there are only two secure examples of Ch'olan vernacular suffixes found (Figure 202) whose function, but not phonology is not covered by the showcases. A positional =**le** suffixation (Figure 202a) is indicative of the pCh intransitive positional marker *–*le* (see footnote 171 for the cognate set). As the example dates into *K'atun* interval 9.4, it appears to be an anachronistic vernacular vestige from an earlier and lost language stage. A =**ni** spelling indicative of an antipassive appears with a root final **Co** sign (Figure 202b), which is not considered as a non-integrative group 2 spelling for the ClM –*Vn*, but as the full phonemic rendition of the Ch'olan –*on* absolute antipassive (Table 41), also as no independent pronoun is preceding. With a Belizean provenance, I take it as evidence for an ECh trait.



a b

Figure 202: Secure vernacular spellings pertaining to a Ch'olan scheme. **a) CHUM=le** < *chum-le-Ø* – 9.4 (COL Yax Wayib, F5), **b) ju-tz'o=ni** < *jutz'-on-Ø* – 9.11 (PUS St. H, E13)[1004].

Yukatekan traits (Figure 203) are specifically strong and usually quite obvious, but only a few examples related to the showcases are provided here. Some cases also exhibit just one isolated example. Spellings of **CV-CV**=**bi** ~ **CV**=**bi** (Figure 203a-d) represent the passive on –*ab* ~ –*b* (Table 7), in accordance with the reconstructed pYu *–*ab* suffix for CVC transitives and –*b* for non-CVC roots. The =**bi** spelling provides the final –*i* / __# with 3SG.ABS inflection. The spellings do not allow to distinguish a language branching, they may either reflect a contemporary pYu stage, a contemporary ITZ / MOP branch passive, or the non-productive suffix still attested in Colonial YUK as a frozen form. The correct answer to this question may be different for each example. It does not only has consequences for

[1004] Proposed translation for *jutz'*: "to wash". Compare to CHN *hutz'-u(n)*, "to wash" (Knowles 1984-88), *jutz'e'*, "lavar (ropa)" (Keller and Luciano 1997: 145), and CHL *wutz'*, "lavar (ropa)" (Aulie and de Aulie 1978: 112). The context does not provide any support for the reading, the verb follows a Calendar Round related to 9.7.12.6.7 and is accompanied by *u[h]t-Ø=iy* in block F13, "after it happened". The text then continues with the dedication date Calendar Round related to 9.11.0.0.0 whose historical information is eroded.

the history of the Yukatekan languages, but also help to answer about the origins of the codices. For a discussion of code-switching with the Yukatekan passive (Figure 203b) see footnote 121. Another passive (Figure 203c) provides the *–k-i* suffix by a =**ki** spelling (see Figure 203l for another case) as the completive marker of referential intransitive verbs, following the analysis by Lacadena and Wichmann (2002: 286)[1005].

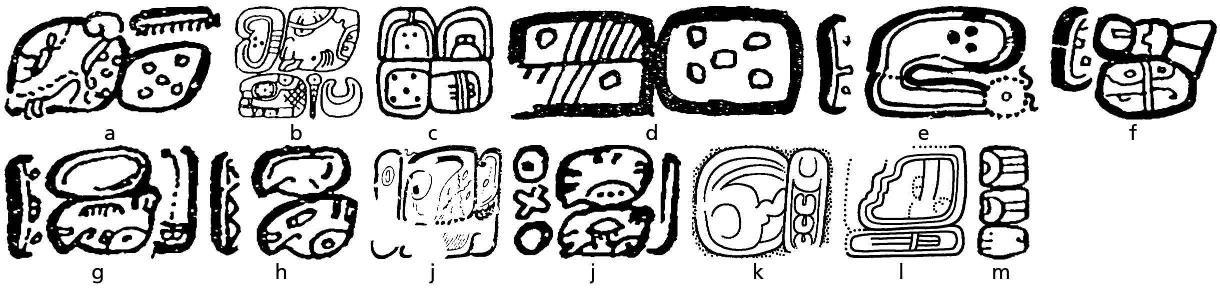


Figure 203: Secure vernacular spellings pertaining to a Yukatekan scheme, a-d: PASS, e-j: VER.TR-COM, k: IMP, l: MED, m: AGN. **a) ba-ka=bi** < *bak-ab-i-Ø* – 11.4 (C Dr. 74, B3)[1006], **b) jo-ch'o=bi=ya** < *joch'-b-Ø=iy* – 10.2 (CHN CC-HB, 13), **c) jo-lo=bi=ki** < *jol-b-ik-i-Ø* – 10.2 (CHN TFL-L2, E4), **d) tz'a=bi** < *tz'a[']-b-i-Ø* – 11.11 (C Ma. 52c), **e) u=jo-ch'a** < *u-joch'-a[j]-Ø* – 11.4 (C Dr. 6b), **f) u=JOY=ja** < *u-joy-[a]j-Ø* – 11.11 (C Ma. 91a), **g) u=pa-k'a=ja** < *u-pak'-aj-Ø* – 11.4 (C Dr. 15b), **h) u=pa-k'a** < *u-pak'-a[j]-Ø* – 11.4 (C Dr. 15a), **i) u=pe-ka=ja** < *u-pek-a[j]-Ø* – 9.16 (EKB M. 96G, N1), **j) u=te-k'a=ja** < *u-tek'-aj-Ø* – 11.4 (C Dr. 8c), **k) IL=le** < *il-e* – 9.15 (XLM P. 3, B2), **l) T'AB=ki** < *t'a<a>b-k-i-Ø* – 10.1 (SBP HS. 1 I, A27)[1007], **m) ko-ko=ma** < *kok-om* – 10.2 (CHN CC-HB, 57).

Yucatec spellings of the format **u=CV-Ca=ja** (Figure 203e-j) represent the Yukatekan transitive verb with the *–aj* completive marker (Table 37). A few caveats remain in this analysis, as some scholars consider the =**ja** suffixation to represent a nominal form (see Chapter 4.1.5 for a discussion) instead, e.g. **u=te-k'a=ja** for **u-tek'-aj* as "his placement" (Boot 2009b: 165, Tokovinine 2007: 19). While a

1005 Note that I distinguish two cases of =**ki** suffixation: (1) for the Yukatekan vernacular *–(i)k-i* suffix, and (2) for the Ch'olan *–ak* subjunctive. Although the latter is only attested with six cases of *uxul-n-aj-ak* (Figure 61l) in Chichen Itza (see footnote 629), I do not consider a Yukatekan vernacular *–[i]k-i* suffix opposite to the analyses of both García Campillo (1996: 50) and Lacadena and Wichmann (2002: 286). As the orthography in Chichen Itza is very shallow and straightforward to provide full phonemic spellings by left-to-right integration (see Chapter 4.2.2.1), I would otherwise expect ****u-xu-lu=na=ji=ki**.

1006 Proposed translation for *bak*: "to spill". The lexical basis is also vernacular, compare to YUK *bak*, "derramar agua por vasos de boca angosta" (Barrera Vásquez 1993: 27). The exact context of the verbal action is obliterated, but undoubtedly fits to the flood scene on the last page of the C Dr. with Goddess O pouring out water from a jar (cf. Taube 1992: 101-103) in her nature as a bringer of deluge. In this relation, also not the substitution of the 'inverted vase title' with the head variant of Goddess O on PNG St. 8, A11 (Teufel 2004: 68). MacLeod and Sheseña (2013: 215) cite another rather compelling example, **AJ ba-ka wi-tzi** < *aj bak witz* (NTN Dwg. 24, B2-C2) as "He of Besprinkled Mountain". The authors (2013: 216-217) furthermore interpret the **8-20^{ki} ba-ka-ba** collocation (e.g. NTN Dwg. 25, B8-B9) as the animated instrumental of the verb and translate as "Rainer". I find this proposal problematic under three aspects: (1) the verb is not attested in Ch'olan, (2) as a transitive verb, it would require prior intransitivation (unless the spelling implies a passivation), and (3) the spelling with a final **ba** sign (instead of =**bi**). As the expression is always associated with the nominal phrase of *Maman Chan Ahk*, a lord from Xultun, I rather tend to consider **8-20^{ki} ba ka-ba** < *28 ba[h] kab* as a personal title, not as an indication for 28 assistants in an agricultural rite.

1007 The original study (Grube, Pallán and Benavides 2010: 253) discusses whether the partly eroded suffix is =**yi** or =**ki**. By a close inspection of the photo, I am inclined towards the latter alternative because of the subgraphemic details.

nominalised Ch'olan passive **u-te<h>k'-aj-Ø*, "his placed one" is still possible[1008], I concur with Wald (2004a: 43-44) to consider a Yukatekan form based on the provenance. More difficult are the **u=Ca-Ca** underspellings in the codices (compare to Figure 203g-h, note that the examples are from different almanachs written by two individual hands) that either allow a ClM or Yukatekan reading (see Chapter 4.1.9 and Figure 103), while the latter choice is more clear with roots other than CaC (see footnote 600 for a problematic case).

A case not yet described is the Yukatekan imperative (Figure 203k) indicated by a **=Ce** spelling for pYu **–e(h)* (Kaufman 1994, A 3a: 4). An indication of the *=e'* topical enclitic (see footnotes 81 and 927) is not possible, although it may otherwise appear with verbs for prosodic phrasing (Skopeteas 2010: 312). Most importantly, *il-a* is not inflected with an ergative pronoun, nor does it bear any other stem-formative or derivative affix. The context also supports an imperative, as the phrase opens with the quotative expression *che'en* in block A1 to mark spoken statements (Grube 1998a).

One hitherto unrecognised example of a Yukatekan mediopassive (Figure 203l) can be inferred by indirect evidence. The probable suffixation by **=ki** requires the transitive root *t'ab* to be intransitivised to carry the referential completive *–k-i* suffix. As *t'ab* is exclusively known in mediopassive form in Classic inscriptions (see Chapter 4.1.12), it is reasonable to assume the same diathesis in this case. The necessary vowel lengthening (Table 47) is of course unmarked in the orthography.

It has been pointed out on various occasions that Yukatekan does not need to intransitivise before a nominalisation takes place. Therefore, a **=ma** suffix following a transitive verb (Figure 203m) is indicative of the *–om* agentive suffix. The expression appears in a nominal phrase, and also has Ch'olan cognates with an intermediate antipassive (Figure 126c).

4.3.4.2 – Potential Vernacular Spellings

Examples of vernaculars may remain insecure for two reasons: (1) the language geography or branch affiliation is unclear, and (2) the orthographic rendition can still be interpreted as a standard ClM form. Apart from a few hitherto neglected examples, this section is a recapitulation of spellings that are already discussed in Chapter 4.1.

One case pertaining to the first group is the *–(a)n* inchoative (Figure 204) that is apparently a semi-productive ClM form. A total of 21 samples have been recorded, predominantly with *ajaw*, "lord" as accession statements (Stuart 2005c: 72); but also with *sih*, "gift", and the HEADLESS.BODY noun (see footnote 223)[1009]. Preliminarily considered a possible WCh vernacular (footnote 222), a distributional survey reveals a pattern of orthographic change and geographic movement that allows to distinguish a

[1008] The same pattern with a –Ø nominaliser (Chapter 4.1.14) is attested with other genuine Ch'olan forms (Figure 140), e.g. **u=TZUTZ=ja** < *u-tzu<h>tz-[a]j-Ø* (CPN St. 4, B7a) or **u=K'AL=ja** < *u-k'a<h>l-[a]j-Ø* (ALH Jd. 1, A6). Note that the mention of an ****u=te-k'a=ja** on PAL P. DOAKS 2, C3 by Lacadena and Wichmann (2005b: 35) is in error, see Figure 51r for the block in question as a passive form.

[1009] The spelling of a part of Jade Sky's name on QRG St. I, A8 as **K'AK' jo-li CHAN-na-ni** is puzzling for the additional **ni** sign. As the name is notorious for spelling alterations that also suggest a different morphology (see 833), it is possible that it indicates an inchoative, but simply may be a redundant phonemic complement.

generic ClM form and a WCh vernacular development. We can assume an *–an* < =**na** / __# ~ *–n* < =**nV** / … pattern, that is attested from the from the early Late Classic on in the Central Peten, Usumacinta and Tabasco region. Together with a pTz **–V$_{1}$n* ~ **–in* intransitiviser (Kaufman 1972: 142), it likely reaches back to pGT. In the Tabasco region, a typical WCh *–n-i* < =**ni** / __# pattern emerges from 9.12 on, especially reflected in CHN *–n-an* [+INC] / *–n-i* [+COM] (see Table 17). From there, it spreads eastwards as far as the Motagua region (until 9.16), still being passed on in the codices. The movement is similar to the innovative WCh *–wan* positional (footnote 498), also from a temporal range (cf. Hruby 2002: fig. 2, tab. 3). Another potential ECh vernacular is the *–(a)jib* instrumental (Figure 155).

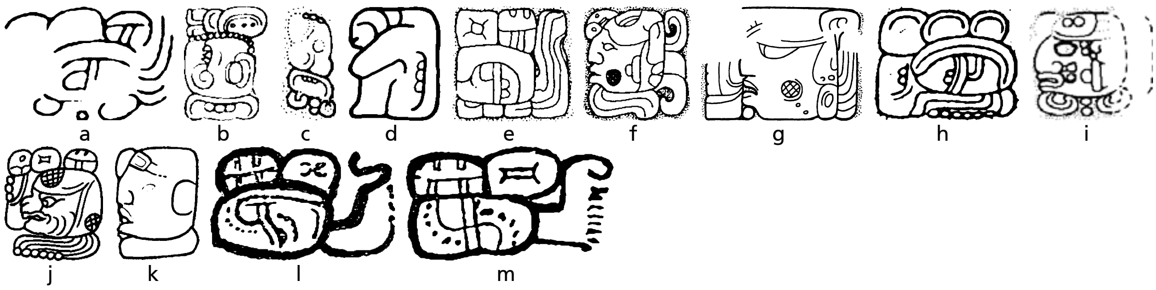


Figure 204: Potential vernacular spellings of a Ch'olan inchoative, a-d: *–(a)n* scheme, e-m: *–n-i* scheme. **a)** ^{a}**AJAW=ni=ya** < *ajaw-n-Ø=iy* – 9.8 (NAR Alt. 1, B8), **b)** ^{si}**SIH=na** < *sih-[a]n-Ø* – 9.15 (PNG St. 11, Bp21a), **c) SIH=na=ya** < *sih-an-Ø=[i]y* – 9.15 (PNG St. 11, C5), **d) HEADLESS.BODY=na** < *HEADLESS.BODY-[a]n-Ø* – 9.11 (PAL HCEE, E2), **e) AJAW-wa=ni** < *ajaw-n-i-Ø* – 9.12 (PAL TI-W, F12), **f) AJAW=ni=ya** < *ajaw-n-Ø=iy* – 9.12 (PAL TI-M, B3), **g)** ^{a}**AJAW=ni** < *ajaw-n-i-Ø* – 9.13 (TAM Msc. 2, C1), **h)** ^{a}**AJAW=ni** < *ajaw-n-i-Ø* – 9.13 (NAR St. 22, E10), **i)** ^{a}**AJAW=ni=ya** < *ajaw-n-i-Ø=iy* – 9.15 (TIK St. 5, B2), **j)** ^{a}**AJAW=ni** < *ajaw-n-i-Ø* – 9.16 (CPN St. N Base S, 3), **k) AJAW=ni** < *ajaw-n-i-Ø* – 9.16 (SBL Str. A-14 T6, G'1b), **l) AJAW=ni** < *ajaw-n-i-Ø* – 11.4 (C Dr. 25b), **m) AJAW=ni** < *ajaw-n-i-Ø* – 11.11 (C Ma. 68b).

The *–(a)n* inchoative exemplifies one morpheme not tangled by the showcase discussions. Among the suffixes discussed in this study, several isolated spellings may exhibit a Ch'olan, Tzeltalan, or Yukatekan vernacular form, depending on the further interpretation of the transliteration. Among these ambiguous examples are the possible WCh **u=hi-li** < *u-hil-i-Ø* collocation on TRT Mon. 8, A9a (footnote 797), or the pTz **u=CHOK ji** < *u-chok-Ø-Ø [ch'a]j* e.g. on TNA Mon. 104, G1 (footnote 315).

As Yukatekan influences are characteristic for the northern lowlands, it is worth to further exemplify some ambiguous cases with a lesser tendency for a true ClM form represented (Figure 205). The case of the full syllabic spelling for "dormitory" (Figure 205a) can be interpreted in favour of a non-syncopated Yukatekan *–V$_{1}$b* instrumental (see footnote 915). Even more intriguing is the comparison to expressions from Ek' Balam (Figure 205b-c) that may represent a Yukatekan lexeme (cf. Lacadena 2002: 118) with a nominal base, and in which =**li** < *–il* is interpreted as a partitive possession suffix (cf. Bricker, Po'ot Yah and Dzul de Po'ot 1998: 359-360, 407)[1010]. The case of the nominalised

[1010] Compare to YUK *way*, "cama; celda, aposento, retrete o retraimiento donde uno duerme" (Barrera Vásquez 1993: 915). All examples from the capstones of Ek' Balam, regardless of their affixations, originate from the same context: *ma<h>k-aj-Ø (u-)way(-[i]l) y-otot*, "covered was the resting place of the house of NN". Note *k'ay-[i]l* (Figure 205d) is interpreted in favour of a Yukatekan =**li** < *–il* suffix (see footnote 920), cognate to ClM =**le** < *–el* nominalisers, also deriving from a transitive root without any overt intermediate intransitivation. The spelling of **Ce** < *=e[']* for the topical enclitic has been noted in several instances (footnotes 81, 594, 927), and with a few instances of **yi**=**ta**=**je** from Chichen Itza (Figure 205e), it also appears in a verbal phrase. While the suffixation pattern resembles the one from Palenque (see footnote 942), the Yukatekan explanation to indicate prosodic phrasing (Skopeteas 2010: 312) seems more compelling. Finally, spellings not complying to a ClM morphology can tentatively be considered to represent a Yukatekan form. The **tz'a-pa**=**ta**=**na** case (Figure 205f) was already considered a verbal form (Lacadena 2002: 112), but without any further analysis except its phrase-initial position[1011].

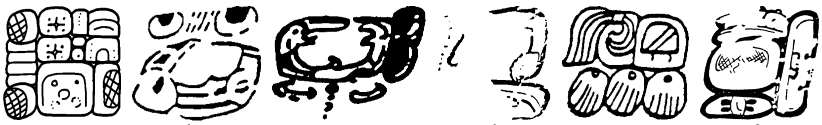


Figure 205: Potential vernacular spellings pertaining to a Yukatekan scheme. **a) u=wa-ya=bi=li** < *u-way-(a)b-il* – ? (IKL Lnt. 1, C1), **b) u=WAY** < *u-way[-il]* – 10.0 (EKB Cst. 1, C1), **c) WAY-ya=li** < *way-[i]l* – 9.17 (EKB Cst. 6, B1b), **d) K'AY=li** < *k'ay-[i]l* – 9.17 (EKB M. R22, F1), **e) yi=ta=je** < *y-it-aj-Ø=e[']* – 10.2 (CHN T4L-L1, G4), **f) tz'a-pa=ta=na** < *tz'ap-t-an* – 9.16 (EKB M. 96G, B'1).

The potential Yukatekan vernacular spelling demonstrate that differences in the orthography may indicate a different morphology, but even more that spelling nuances may provide a different vocalisation that is the result of a vernacular influence. This leads back to the *y-e[h]t-ej* spellings in Palenque (see footnote 942). Although there are other isolated cases, where /a/ and /e/ may interchange (see footnotes 734, 922, 925), the Palenque situation is of special importance: the Tabasco region was the origin of other WCh vernaculars that entered the writing system and eventually spread eastwards. The earliest of these spellings with =**je** date back to 9.11, and can already be considered a WCh vernacular. Although ClM possibly still reflected the six-vowel system, it usually did not orthographically distinguish it (see Chapter 4.2.2.1). As ECh also does not retain the sixth vowel, the particular spellings in Palenque can be considered as an orthographic WCh distinctiveness.

that the putative vernacular is embedded in a phrase that opens with a ClM passive and exhibits a Ch'olan phonology *–otot* (indicated by a phonemic complement **ti**), opposed to the Yukatekan *–otoch*.

[1011] As *tz'ap* is a transitive verb in ClM, I consider a nominal form (as with *way*) to explain =**ta** as the indicator for the Yukatekan *–t* 'factive' suffix (see footnote 83). For YUK, there are three nominal meanings of *tz'ap* as (1) "cosas dispuestas en capas o generaciones; sucesivo; superpuesto", (2) "conjunto de cosas planas", and (3) "cuenta para hijos, hermanos mayors y menores" as a numeral classifier (Barrera Vásquez 1993: 878). The morpheme indicated by =**na** is interpreted as the participle *–an*, cf. YUK *–an* ~ *–aʔan* (Bricker, Po'ot Yah and Dzul de Po'ot 1998: 373). Such analysis makes the participle a stative predicate. The meaning remains unclear. It follows the information initiated by the passive *tu<h>t-aj-Ø*, "was renovated", followed by **tz'a-OL-ti** and what appears to be a nominal phrase ending in *ch'ok* (EKB M. 96G, X1-A'1), likely as a new stative expression. The text following is badly obliterated.

4.3.4.3 – Sociolinguistic Considerations

Although the showcases demonstrated strong WCh traits in the western lowlands, the text tradition basically retained the ClM language. The situation in Yucatan is slightly different. While the texts there are also essentially written in ClM (still in the codices [cf. Wald 2004a]), the imprint of Yukatekan vernacular forms is stronger in comparison to WM branches (and while Ch'olan vernaculars are still more similar to ClM), especially in comparison with Tzeltalan. After the Classic collapse in the central lowlands, the question must be raised to what extent the Yukatekan influence is the emanation of a (partly) disrupted literary tradition.

Certainly, the collapse did not foster the furcation of the languages, when ClM ceased to be the high language of the courts who commissioned the majority of texts. Vernacular influences are palpable much earlier, and a calibration of the Ch'olan language tree (Figure 206) with epigraphic evidence provides no such evidence. The relatively stronger influence of Yucatecan must be viewed under sociolinguistic aspects, also as Yukatekan is not part of the WM branch. At this point, the reasons must remain unclear (see section 3 of Chapter 3.2.1) and certainly cannot be explained with a monocausal model. But the lack of a constant feeding of Ch'olan into the writing system from the southern lowlands might have played a certain role for letting a Yucatec tradition of writing come into being.

With the strong bonds of ClM as the written high variety throughout the literary tradition, one may ask about the formation and care of a standard variety, as theoretically developed by the Prague Linguistic Circle (Havránek 1929). Are the actually indications for status and corpus planning, thinking of Riese's (1988: 69) "a system of higher education" and exchange (see Chapter 2.5.3.1 and section 3 of Chapter 3.2.1)?

We may still speak of a 'peer prescriptivity' for language standardisation, fostered by inter-elite exchange of polities that during the Classic period were most certainly located in areas of different spoken vernaculars. If the assumption of common consensus about the use of an elite high variety is true, it must necessarily mean that what became ClM was actually a spoken language at a certain point of time. This is in accordance with the linguistic model used in the thesis that ClM is the result of a language development from pGT via pCh. As such, the appearance of ancient forms like the absolutive *–aj* in ClM can be explained (see Chapter 3.1.1.4), while it is lost in modern Ch'olan languages. With the occasional, but sometimes systematic, introduction and continuation of vernaculars (with the WCh positional *–wan* being the broadest example, also see footnote 498), the ClM high variety can be viewed as pluricentric without denying a standard written language. Thus, the usage of the term 'vernacular' must be used with caution, but is otherwise used in this study to describe anything deviating from the 'pure' ClM standard. We may further locate the region where the predecessors of ClM were spoken in the larger Peten area; here, the first polities arose and likely set the standard (cf. Byron [1978] for a case study on Albanian). The consideration of regional high varieties also emphasises that ClM is more an umbrella term (see footnote 1) and does not describe a language stage within a phylogenetic model, as 'Classic Ch'olti'an' (Houston, Robertson and Stuart 2000) does.

As far as corpus planning is implied, the ‘peer prescriptivity’ likely was promoted by the scribes for graphisation. Again, we may assume that the first polities to commit hieroglyphic texts set the standards which others followed. The spelling conventionalisation of morphographs in phonographic use (such as **CHAN=NAL** < *chan-al*, see section 5 of Chapter 3.3.6.2 and footnote 970) is an example, while the switch from =**la** > =**le** for the *–el* possessive suffix is evidence for orthographic modernisation by the introduction of new graphemes. However, a normative codification was likely never reached, as the flexibility the writing system allows was exploited to a certain degree. As such, the orthography and its supragraphematic features (such as suffixation and harmony patterns) are a ‘best practice’ model, being prescriptive by common sense.

The process of language and corpus planning in archaic societies must always be reconstructive, but has largely been neglected in epigraphy and linguistics, while a comparative approach (with current theories against historical writing systems) might be beneficial not only for Mayan studies. For these, the epigraphic data base is still to limited to trace indications or even evidence how, where, and when standardisation took place and find implications for the underlying sociolinguistic processes. These may further help in the reconstruction of the Classic Mayan language affiliation as well as a language geography (compare to Figure 3).

4.3.5 – Classic Mayan Language Affiliation

In relation to the question of the Classic Mayan language affiliation (Chapter 1.2.2.3), the showcase samples and other epigraphic evidence found during the data collection (Chapter 4.3.4) contribute further to the historical configuration of the Greater Tzeltalan branch in general, and the Ch’olan branch in particular. It is appropriate to restate the quote provided in the introduction of Chapter 3 that “hieroglyphic data will never contribute as much to Mayan historical linguistics as it receives” (Justeson 1985: 471). Almost 30 years later, the field of epigraphy – by acknowledging the results of historical and comparative linguistics – has sufficiently advanced to constitute an important source of linguistic information of support. Those samples considered as vernacular features are not only valuable to determine regional high varieties. Their provenance and dating, together with their broader or narrower linguistic affiliation, also allows to calibrate data from historical linguistics with epigraphic data (Figure 206) [1012].

[1012] The evidence bases on samples systematically gathered for the showcases or occasionally found in connection with the data collection. Figure 206 usually provides the earliest secure evidence, occasionally, more examples are included in case of doubt (indicated in grey). (1) From the showcases: PASS *–w-aj* for ECh (UAX Str. B-13 R. 7-1, B4 – 9.0 [insecure]; TIK T. 4 Lnt. 3, B5 – 9.15); MED *–m-aj* for ECh (CPN Alt. Z, C3 – 9.17); POS *<h>…-aj* for pCh (TIK Hombre, C8 – 8.18) and for pTz (TNA Mon. 168, A6 – 9.7); INCH *–t-aj* for ECh (TIK T. 1 Lnt. 3, C2 – 9.13); INCH of VER.TR *–m-aj* for WCh (PAL TI-M, H9 – 9.12); INCH of VER.TR *–b-aj* for WCh (PAL PMI1, D4b – 9.14); INSTR *–ib* for CHR (CPN Str. 10K HBh., A5 – 9.17); TEMP **–äj* for WCh (PAL NGJ1, G – 9.11 [insecure]). (2) Other vernaculars: POS *–le* for pCh (COL Yax Wayib, F5 – 445 AD); POS *–wan* for WCh (TRT Mon. 1, A4 – 9.11); INCH *–n-i* for WCh (PAL TI-W, F12 – 9.12); IND **–o’m* for pGT (SBT M. LP, Ap2 – 200 BC [see footnote 510]); IND *–Ø* for pTz (TNA Mon. 164, Q1 – 9.14 [insecure]); ANTIP *–on* for ECh (PUS St. H, E13 – 9.11).

The expression of surprise that the epigraphic evidence matches the linguistic reconstruction fairly well possibly must more be granted to the epigrapher, at least by the limited set of data processed by the showcase investigations (leaving apart other morphemes and lexical data). The congruence can only be maintained when following the traditional phylogenetic model that acknowledges a WCh / ECh distinction, not the 'Classic Ch'olti'an' hypothesis (cf. Houston, Robertson and Stuart 2000: fig. 1) also challenged by other authors (Mora-Marín 2005b, c, 2009, Wichmann 2002a). The re-assessment of the time depth of passive and mediopassive derivation (Chapter 4.1.12 and Figure 133) also complies better with the traditional model than with the 'Classic Ch'olti'an' hypothesis, as it features less discontinuities.

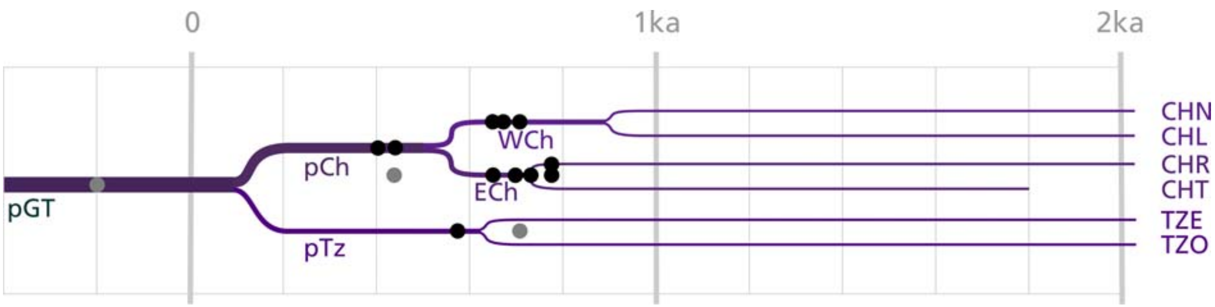


Figure 206: Greater Tzeltalan language tree by historical linguistics with epigraphic evidence: ● = secure vernaculars; ● = potential vernaculars. Sven Gronemeyer, with own evidence after several sources (Brown 1991: tab. 1, Campbell 1984: figs. 1, 2, tab. 1, England and Elliott 1990: xviii, Houston, Robertson and Stuart 2000: fig. 1, Kaufman 1976: fig. 1, tab. 1, Lacadena and Wichmann 2002).

The concurrent appearance of forms that can only be explained as ECh and WCh vernacular influences demonstrates permeation of 'the' ClM standard with regional peculiarities, although it was continued to be used superior to these more localised varieties, these in return being superior to individual languages (so far only securely attested for CHR). The temporal distribution cannot be explained with the 'Classic Ch'olti'an' hypothesis that assumes a prior CHN and CHL split, otherwise forms restricted to WCh morphology must appear much earlier. On the other hand, the development of ClM must be of some antiquity, as the intransitive positional marking shows. The proper pCh **–le* suffix appearing once at around 445 AD was already replaced by *–laj* as early as 320 AD (COL Leiden Plaque, B9, see footnote 171), possibly by adopting a diffused pYu form (MacLeod 1984: 243). Whether this was triggered by direct language contact or via the writing system is unknown. A close parallel is visible with the innovated WCh *–wan* that replaced *–laj* later in ECh (see footnote 498) via a downstream transfer from the writing system. But this shows that ClM was established as the written high variety out of spoken pCh by the 3rd century AD at latest, if not much earlier.

The dating of the furcation of pCh as the spoken language besides the ClM high variety is likewise afflicted with a considerable variance. Both WCh and ECh find firm reflection in the epigraphic corpus at around 660 AD, while historical linguistics settles the split at around 500 AD. But firstly, changes in the spoken language may need a certain time affect the written language. Secondly, there are dubious examples to consider. The case of **SPIRAL=wa=ja** (Figure 58b) from Uaxactun is considered as evidence for the ECh *–w-aj* passive (Lacadena and Wichmann 2002: 302, fn. 19) that today only survives in CHR. As the main sign is undeciphered, **wa** might also act as a phonemic complement or as the root coda grapheme in a syllabic spelling. If the interpretation as a derived passive is true, the evidence reaches back at around 430 AD, making the branching of ECh much earlier. Two options then remain for WCh: (1) without earlier evidence, I assume that pCh continued to be the spoken language in the western lowlands much longer, before it turned into WCh; or (2) also considering the high innovative capacity of WCh languages, it furcated earlier as well.

Clear evidence for further branching into individual languages is only available for CHR (Wichmann 2002a) as early as around 780 AD, while historical linguistics proposes around 740 AD. The temporal proximity is quite close, but Figure 206 also shows that examples that conservatively still pertain to ECh continue until the end of the Late Classic. This is either the result of an ongoing development process (as a language split is never sudden, see Chapter 3.2.1), or demonstrates the further use of the ECh standard variety.

The evidence used here bases on the showcases and is thus purely morphological, and the addition of lexical features might alter the congruence overall or just in details. A final remark concerns the comparison of this tentative review with the automated dating of language split based on a Levenshtein distance based algorithm (Holman et al. 2011: 846, tabs. 1, 6, Müller et al. 2013). When comparing the linguistically reconstructed and epigraphically supported Greater Tzeltalan branch (Figure 206) with the automated tree (Figure 207) containing these two languages, several important differences are visible (also see footnote 51).

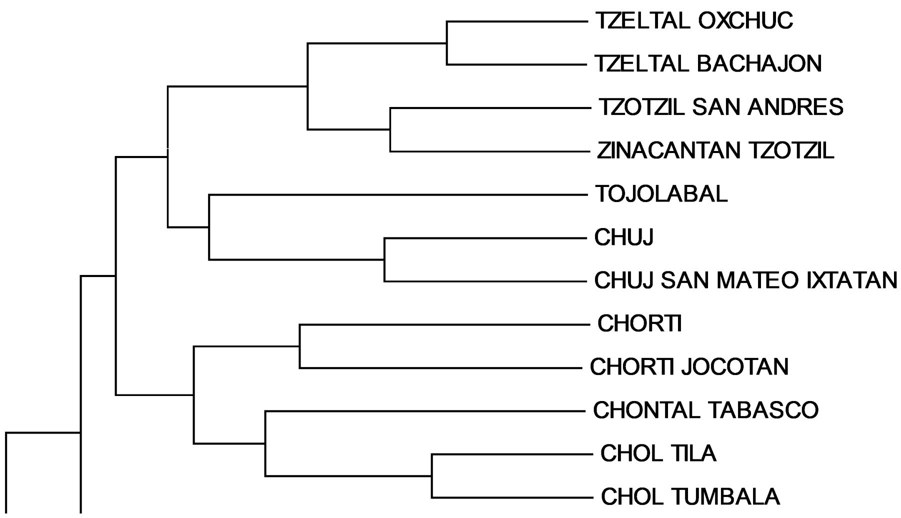


Figure 207: Language tree with Ch'olan and Tzeltalan by automated reconstruction after lexical similarity. After Müller et al. (2013).

Most notably, the Chujean branch is included as a sibling to pTz, in partial accordance with the subgrouping proposed by Robertson (1977b). While CHT is entirely omitted, the tree furthermore makes CHL a daughter to CHN, possibly because it is more closer to CHT in certain respects (Houston, Robertson and Stuart 2000: fn. 2). As Wichmann (2006a: 283) argues for a WCh / ECh split at 400 AD and further ECh diversification around 600 AD, a calibration point for Ch'olan was set at 1600 BP [sic!] (Holman et al. 2011: 846). The algorithm delivers 1148 BP, which would equal 852 AD. While in comparison with the epigraphic evidence presented in Figure 206, the first date is possibly too early, the latter is definitely far too late. One of the major concerns regarding the automated calculation is the glottochronological methodology restricted to lexemes and word similarity, while the morphology is excluded. Certainly, more epigraphic data are needed to approach the question of dating the language splits and a better understanding of the historical development of the Greater Tzeltalan branch.

4.3.6 – Isoglosses

With a plausible congruence of epigraphic and linguistic data for the historical configuration of the Greater Tzeltalan languages, we may now ask where these languages are attested, where they were probably spoken, and how their distribution was facilitated. As a first step, vernacular features of known provenance are mapped to identify clusterings and patterns. These need to be distinguished after secure and potential examples to quantify the plausibility for language affiliation and spread, also in terms of their amount. In practice, this approach is compromised by the rather scarce evidence, both in quantity of samples and the quality of secure affiliations.

Grammatical evidence is deemed the most secure source for language attribution (Houston, Robertson and Stuart 2000: 326), and it is used as the sole source to assess the ClM language affiliation (Chapter 4.3.5). The surfacing of vernaculars has been acknowledged despite a written high variety in certain areas (Houston, Robertson and Stuart 2000: 335), and subsequent studies (Hruby 2002, Hruby and Child 2004, Lacadena and Wichmann 2002, 2005a) traced and mapped this evidence in varying degrees and with different examples. The most complete charting conducted so far is the map in Figure 2 (Wichmann 2006a: fig. 1), at the same being rather unspecific with respect to the data and its quality.

The vernaculars identified among the showcases (Chapter 4.1) and the scattered examples found along (Chapter 4.3.4) mostly feature morphological evidence (Figure 207, as summarised in footnote 1012), but also include lexical data. Their distribution with all parameters is mapped in Figure 208. Overall, the data are not very exhaustive, but to some respect the image is more specific than in Figure 2, as a 'vernacular' is treated in a conservative definition of restricted range to reconstruct its core area[1013]. Apart from the overall ClM 'standard' variety, the map illustrates more the zones of regional high varieties in writing, leaving apart the question whether these were inferior or on equal terms with

[1013] Hence, the original WCh intransitive positional *–wan* is not a very suitable indicator to determine the reach of the WCh core zone, as it became very common all across the Maya area in a rather short time, in contrast to other features such as the *–C-aj* inchoatives of transitive verbs. Also, the *–laj* intransitive positional is not an appropriate marker either, as it is not considered a genuine ECh feature, but the 'standard' ClM suffix, a circumstance also acknowledged by the representatives of the 'Classic Ch'olti'an' hypothesis (cf. Hruby and Child 2004: 16-17). Furthermore, the suffix probably diffused from pYu language communities north of the original pCh zone (see Chapter 4.3.5), where in ClM, it replaced **–le* as the supposed original pCh suffix.

'standard' ClM at any given time. The patterning from the epigraphic evidence is less suitable to determine the areas of spoken languages, although these correlate to a certain degree. The resulting isoglosses, compared to the extent of vernacular features drawn by Wichmann (2006a: fig. 1), are thus a rather conservative estimate, however, as the map is not diachronic (see Figure 206 instead), it depicts a tendency towards the maximum spread of vernacular features.

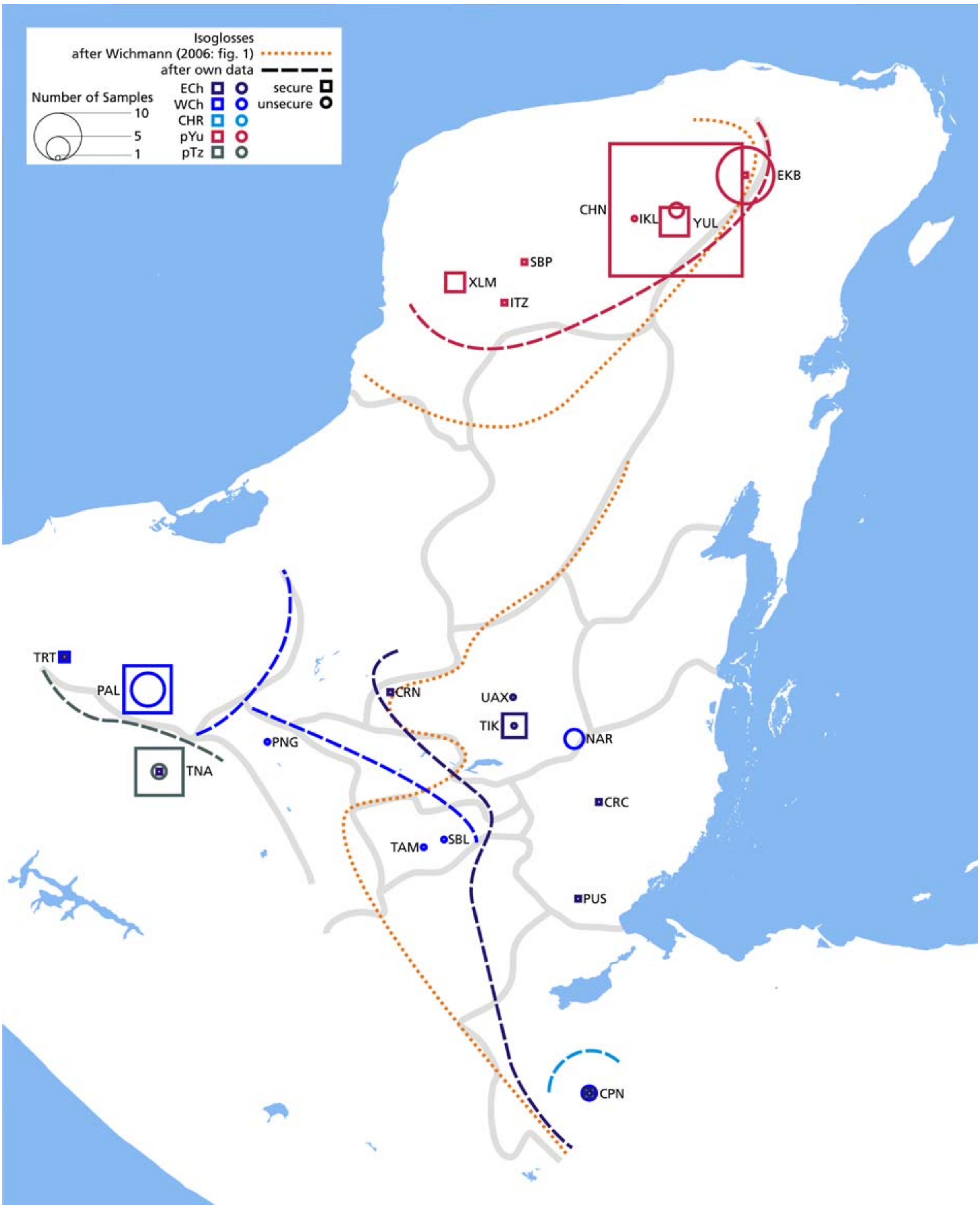


Figure 208: Charting of vernacular features in provenanced inscriptions with proposed isoglosses. Sven Gronemeyer.

Also considering the data represented in Figure 2, WCh features are apparently more represented in the overarching ClM scribal tradition than truly ECh vernaculars, considering that many ClM forms are closer to what is reflected in CHT and CHT than in CHN and CHL. According to the mapped data, the WCh core zone can be established in the Tabasco lowlands, most notably in Palenque, but also with distinct traits in Tortuguero. These sites are also the ones were the *–wan* positional suffix is first attested (Hruby 2002: fig. 2) between around 650-680 AD, before it spread eastwards up to Copan within 100 years.

Other vernaculars remain stationary, such as functional shift to the inchoative of transitive participles on *–C-aj* only attested in Palenque. We can also posit a sharp delimitation of this WCh core area to a not very accentuated pTz area to the south, where Tonina exhibits the only firm examples among the intransitive positional. No such features mutually appear in the texts, and two possible explanations can be made: Palenque and Tonina were long-standing enemies (cf. Martin and Grube 2000: 171, 180-181, 183-184) and are also physically separated by several parallel, east-west bound ridges of the Sierra del Norte de Chiapas. Other eastbound WCh features are less secure, such as the *–n-i* inchoative found outside the core area up to Naranjo and Copan. I assume an extended WCh zone because of the evidence from Piedras Negras, Tamarindito, and Seibal, which can easily be theorised by intense contact of language communities along the Usumacinta and its tributaries from the Pasion area as part of the 'Great Western Trade Route' (see footnote 994).

Without doubt, the western lowlands show a vivid capacity for linguistic innovation, of which some were subject of an upstream transfer into writing. Beyond the core region, other sociolinguistic triggers may apply for such feature replacements in the high variety, which can be both externally and internally motivated. An example for the latter would be the notion of being *en vogue* to use novel forms. This may partly be the effect to exalt bilingual abilities in a contact area which, in a cascading effect, expands once an innovation stabilises.

The pCh core region is supposed to have developed in the central and north-eastern Peten lowlands. Here, the earliest known major centres developed in the Pre-Classic period, where a possible pGT spelling is known from San Bartolo and the Dumbarton Oaks jadeite celt (see footnote 510), and where pCh spellings are confirmed in Tikal and on the Yax Wayib mask (see Figures 66a and 202a). True ECh vernaculars are possibly known from Uaxactun in the Middle Classic, but certainly from the Late Classic in Tikal, Caracol, Pusilha, and La Corona and Copan as the most outbound sites. Outliers are known from Tortuguero and Tonina. Copan is furthermore the core region for the later split of CHR (Wichmann 2002a), closely matching the assumed Colonial (Figure 3) and contemporary distribution centred in the Guatemalan department of Chiquimula (Oakley 1966: 235). Undefined to the south, the region closely confines to the north, where CHL possibly developed and was historically spoken (Robertson, Law and Haertel 2010: 3-8). In Classic times, the ECh zone reached the supposed extended WCh area and likely extended further west and possibly merged with it upon the WCh spread.

For the pYu region, Chichen Itza was the Post-Classic centre of text production, thus also exhibiting the most prominent set of pYu vernaculars. The predominance of syllabic spellings is another characteristic feature, likely being a result of psycholinguistic phenomena (see Chapter 4.2.2.2). The remaining sites concentrate in the north-western part of the peninsula, while evidence from the north-eastern areas (with Coba as the major centre) is absent, where in contrast to the south-eastern parts (with sites like Dzibanche or Pol Box) text production was also less pronounced. I propose a smaller pYu core zone, but its total extent is basically undeterminable. If pYu was not spoken (if not written) in other areas before, then me must assume a larger area in Late Post-Classic times, depending on the provenance of the three surviving codices (see footnotes 115 and 116), and an even more extent area in Colonial times (Figure 3).

The extent of the pYu core zone also relates to its contact with ClM predecessors (see section 5c of Chapter 3.2.1), as proposed by previous authors. While some ClM phonological and morphological evidence can be explained in favour of a pYu substrate (see footnotes 404 and 433), it must further be distinguished on a case to case basis. Especially phonological indications such as ClM *kab*, "earth" instead of ***chab* point to an explanation from outside the pGT branch. If so, we may assume a Pre-Classic pYu language region adjacent to the proposed north-eastern lowland pGT core sphere to allow diffusion processes.

Other markers to identify linguistic areas and draw isoglosses are not utilised in this study, but have been outlined in several showcases. Lacadena (2000b) was able to proof a diverging nominal syntax in the Early Classic of the lowlands and Post-Classic Yucatan. Another area to provide auxiliary support is onomastics. While toponomastics still requests a systematic survey, anthroponomastics has received greater attention (Colas 2004). Many, if not most, personal names known from the nobility seem to feature a typical 'standard' ClM lexeme inventory and morphology. However, regional differences in the name composition can be determined (Colas 2004: 317-325), although these may also be influenced by sociolinguistic factors (Colas 2004: 326-327). As proper names (not only of individuals) are most typical for the regionally spoken language, there is a good probability that names were fixed in writing using the ClM high variety, such as Charlemagne appears as 'Karolus Imperator Augustus' in official Latin documents, or as the humanists Latinised their named in their writings, hence know Niklas Koppernigk better as 'Nicolaus Copernicus'.

A final comment concerns the congruency between the analytical regions (see Chapter 2.5.4) and the isoglosses worked out in this study. It is necessarily biased to a certain degree by the fact that Wichmann's (2006a: fig. 1) isoglosses were utilised to draw borders. Parts of the Tabasco / Chiapas border can, besides geographic factors, still be supported by the vernacular differences between WCh and pTz. But especially the central regions (Central Peten, Western Peten, Pasion, and Southern Peten) may feature major overlaps between WCh and ECh, as does Central Campeche for ECh and pYu. The geographic regions determined did not reveal any overt misassignment for a specific site or microregion during the analytic process. But with more features included and a deepened knowledge of ClM linguistics, future studies should constantly redefine geographic regions during corpus-based analyses as far as the evidence contributes, until the outcome can provide the best possible definition.

5 – Evaluation

"How often have I said to you that when you have eliminated the impossible, whatever remains, however improbable, must be the truth?"
Sir Arthur Conan Doyle, 1890: The Sign of the Four, Chapter 6

What is the impossible that this study eliminated? All what remains to conclude is that the remaining 'truth' contained herein is the result of the methodology applied and the interpretation of the epigraphic evidence against the background of linguistic source materials and statistical probabilities. While the 'truth' in this study tries to be objective, it naturally remains subjective, and will always be relative in an epistemic sense, compared to previous, contemporary, and future studies on Maya writing.

In this sense, the evaluation of this study compares the many conclusions drawn for epigraphy, comparative graphematics, linguistics, or a theory of mind with the initial situation on which the conducted research bases. How tall has the dwarf of corpus linguistics and empirically guided epigraphic research grown on the shoulders of previous studies? To better answer this question, this chapter reviews the source situation, the initial desiderata and the formulated objectives (Chapters 1.3 to 1.5) and compares the achieved with the 'current' state of research, which of course developed as well to make slight adaptations

5.1 – Source Materials

The aim to compile all available texts for data mining surely is ambitious, and it truly was a task set too indefinite. While the inscriptions of both large and small sites may thoroughly be documented, either in publication or at least in the grey literature, the documentation remains scattered and cluttered. Moreover, many pieces remain unpublished and beyond an easy access for the epigrapher. This mostly concerns portable artefacts (for example the many text fragments on sherds in the *Ceramoteca IDAEH* in Guatemala City), but also 'monumental' inscriptions held in storage of magazines and private collections.

Even though not all texts were available for sampling, the showcase data base still contains 3,890 samples from 1,540 different texts on a physical object (see Chapter 1.2.1.1)[1014]. These originate from

[1014] In accordance with Riese's (1980: 3) definition of a *text* as the totality of hieroglyphs on an object. With a deeper understanding of Maya writing, it turns out that this may be an ontology not appropriate enough for the huge variety of how writing can be represented. A physical object may contain more than one text, such as the thematically arranged wall paintings in each of the rooms of Bonampak Structure 1 (where one wall painting again distributes across several walls). In other cases the relation inverts, as for example the text of the Copan Hieroglyphic Stairway is written on 62 steps, each made of several individual stone blocks. For the summarising count, a uniquely numbered 'inscription' is – somewhat inconsistently – referred to as a text, thus e.g. an individual caption in each of the rooms of Bonampak Structure 1 or each step of a stairway, while each codex is one

138 individual sites (plus unprovenanced collection items and the three codices), which is about one third of the sites listed by Riese (2004). One requirement to facilitate epigraphic research is a centralised repository containing all hitherto known inscriptions. This is the aim of the *Textdatenbank und Wörterbuch des Klassischen Maya* project located at the *Rheinische Friedrich-Wilhelms-Universität* in Bonn, establishing a data base of digitalisations and a machine-readable corpus for a variety of research questions; but also a comparative and etymological dictionary of the Classic Mayan language.

Although research has produced a variety of hieroglyphic dictionaries with imagery, transliterations, transcriptions and quotations, an exhaustive data base is pending as well. More importantly, a thorough and accurate grammar for Classic Mayan, following common linguistic standards, is missing as well. This lack does not only account for the language of the hieroglyphs, but also for Colonial and modern Mayan languages. Both the quality and quantity of linguistic materials is heterogeneous for each of these, making a comparison for one language delicate already, and making a comparative view between languages or branches a challenging endeavour. A synopsis of several grammatical morphemes from a large base of linguistic materials is provided in the tables of Chapter 3.1 for four language groups. In this respect, a consolidated morpheme inventory is desired that establishes a concordance between the different standards used in the existing literature. By using a unified terminology, phonemic and functional differences will surface more clearly. But above all, more linguistic studies on Mayan languages need to follow certain standards and reach beyond a mere descriptiveness, e.g. by applying a typological perspective to facilitate comparative work.

5.2 – Desiderata

WITH REGARD TO THE TOPIC of this study, five broadly interrelated desiderata have been formulated with the research design in spring 2011. I will address these original research questions and contrast them with the achieved results. Furthermore, as the data analysis and interpretation also contributes to related aspects that are not part of the thesis topic and core questions, a more generalised perspective on the interdependence between grammatology and linguistics is provided as well. For intermediate evaluations that were part of the linguistic hypotheses and statistical analyses, see Chapters 3.2 and 3.4.

(1) *Writing system typology*: The introduction provides a brief, but first comparative approach between Maya hieroglyphs, Egyptian, Cuneiform, and Japanese writing systems. Instead of using arguments from other writing systems for a line of support, it is more productive to apply a multi-faceted approach with comparisons, thereby obtaining a clearer classificatory

text in this scheme. Future studies need to optimise such relations to operate with a more precise definition of *monument*, *inscription*, and *text* to provide a binding number of how many hieroglyphic 'texts' we actually have. This also needs to reconsider to what level of legibility a 'text' is considered as such (see Calvin's [2006: 24-27] text categorisation). The original repository of objects processed for data sampling in this study roughly comprised ~ 4,100 texts.

benefit. Contrasting different systems leads to a clear understanding of similarities as well as differences and leads to a more precise typology. In this sense, this study advanced the understanding of the Maya writing system in several respects. While the principal dichotomy between cenemic and pleremic signs is retained, a deeper understanding of the sign properties allows a better settlement of Maya writing among other similar writing systems. Among these, Maya writing occupies its own, unique niche. While certain strategies and features, such as semantic disambiguation or polyphony, are common among such pleremic-cenemic systems, each of these found its own way to cope with them. Maya writing shares some intriguing features best compared to Japanese, such as the phonographic use of morphographs, similar to the *man'yōgana* spellings. Whereas these were an evolutionary step before the *kanji* / *kana* system, Maya writing applied morphographs and syllabograms already, but only occasionally applying morphographs in an auxiliary manner in the background of a still deficient graphemic lexicon. The 'morpho-syllabic' definition applied in the thesis makes Maya writing more close to Japanese, although the latter has a slighter emphasis on logographs. Less accentuated are similarities to the more logo-syllabic Cuneiform, and even lesser to the logo-consonantal Egyptian. A wishful project for the future would be the determination of a similarity index for certain features among related writing systems to clarify a conceptual relation on a granular level, but also determine an overall correspondence to arrive at a better typology.

(2) *Sign properties*: The sign properties are the key element to determine the working mechanisms of a writing system, especially in terms of orthography, but also for anchoring it in a typology. The nature of the Maya graphemic lexicon is of course not fundamentally changed by the research, but certain characteristics have been carved out in more detail. Syllabograms are basically cenemic and phonographic, but pleremic and morphographic properties with certain roots and among underspellings can be imposed on them. They furthermore may carry a supragraphematic meaning in the environment of the harmony rules and in their function to graphematically indicate grammatical morphemes, especially in the suffix domain with distinct affixation patterns. Morphographs are basically pleremic and distinguish different meanings by heterography, but exhibit homography with polysemy. Both behaviours are visible among free and bound morphemes. They may also receive a cenemic usage within root spellings and across morpheme boundaries. This makes the two sign classes less strict as for example in Japanese. Their properties also question the necessity of morphosyllables, as also demonstrated by comparative evidence from other writing systems with a deep orthography, such as Egyptian, Hebrew, and Arabic. The mental lexicon of the underlying language is nevertheless able to correctly attribute sign and phoneme strings and reproduce the spoken word, even in 'rebus-like' cases of homophonic sign substitutions. A request to future research is to work on a broader comparative basis. Graphemes must become more parametrised in data bases to pursue questions regarding their function, but this require-

ment is helpful beyond the definition of sign classes and carving out of sign properties. Other grapheme functions mentioned, but not pursued by the scope of this study, are diacritics and semantic classifiers in Maya writing.

(3) *Harmony rules*: They are a special case in the orthography, displaying some sort of orthographic paradox on. While Maya writing often applies a deep orthography by simple morphographic root spellings that require sound interpretation and addition from the mental lexicon, it is on the other hand quite shallow by applying harmony rules and affixation patterns. The assumed harmony rules must distinguish between the root and suffix domain. For roots spellings, the existing models have been evaluated against a statistical significance test. None of the originally published data for each proposed mechanism to indicate vowel quantity convincingly matches the lower bound of acceptance. In accordance with the postulations about the pCh vowel system done by historical linguistics, this study applies a radically altered model. Long vowels are not considered at all. Instead, it is assumed that the root harmony patterns indicate vowel quality that by a supragraphematic level additionally provides prosody and possibly a 'received pronunciation'. As the orthographic mechanisms of roots are not part of the objectives, further research is required. It would need to comprise an exhaustive sampling of parametrised root spellings to compare it with a more thorough reconstruction of the ClM vowel system and its allophones. For suffix spellings, the conception that a harmony rule set governs the indication of vowel quantity to distinguish functionally different minimal pairs of suffixes was proposed. This model is again superseded by the postulation of a ClM qualitative vowel hierarchy, as also graphematic problems with varying vowel combinations were highlighted. But the model of stress indication by harmony patterns cannot account by the suffix phonology and the statistically determined affixation patterns.

(4) *Affixation patterns*: The core question of the present thesis, the graphematic representation of suffixes and the orthographic mechanisms at morphemic boundaries and on junctures, required an extensive data collection. But the statistical analyses and the interpretation of the data, independently conducted for each showcase, can be summarised quite comprehensive with a clear result. For the alternative hypothesis to be proven, it was assumed that the scribes generally applied a shallow orthography at the root coda for a full phonemic spelling. This is seldom the case, and frequently occurs with certain lexemes or grammatical morphemes only. If applicable, a deep orthography with a morphographic root is preferred, while a mixed spelling with a complemented syllabogram is even rarer than a full syllabic rendition. Furthermore, the unattached root harmony pattern is frequently altered in the latter two cases in order to provide the correct suffix vowel, as assumed by the alternative hypothesis. This is even true, if the grapheme indicating the suffix is underspelled. Otherwise, the alternative hypothesis also operated under the premise that grammatical morphemes are indicated by syllabograms, as the conception of morphosyllables would make

certain analytical questions obsolete. The showcase discussion reveals that each morpheme and its correlated function is regularly indicated by typical affixation pattern, which can be (semi-)constant or (semi-)harmonic. Especially the latter case is, among others, a caveat against morphosyllables, while the then missing consistency among the spelling of bound morphemes adds another one. Some affixation patterns also show a diachronic development that can be correlated with the development of the graphemic lexicon. A comparison with other writing systems that have a rather deep orthography also demonstrates that a correct vocalisation and functional attribution can nevertheless be achieved by the mental lexicon, which in the Maya case likely is more parsed. Nevertheless, the affixation patterns are a supragraphematic feature that aids the cognitive processes when converting a sign string back into spoken language, although other factors like the lexical class or the syntactic role also contribute. The determination of the ClM affixation patterns also feeds back to the questions of sign properties and the writing system typology. This study has only investigated some representative showcases, a confirmation of the results by the entire set of grammatical morphemes known from ClM is still pending, especially by prefixes.

(5) *Language affiliation*: To provide a sample coverage as extensive as possible, the showcases have also been selected after their supposed Ch'olan language affiliation, only occasionally are homophonous vernacular forms included from outside this branch. A correlation of the epigraphically attested morphemes and their inferred function with the linguistic data clearly shows a strong compliance with the evidence from Ch'olan language materials. In case data are absent and not reflected any more in modern or Colonial languages, historical linguistics may provide an appropriate ancestral form by comparison with the Tzeltalan sibling or other WM languages. But the exact origin and time depth of ClM is still elusive. It is certainly closely related to pCh, but apparently conserves forms that date back to a pGT stage, the reconstructed language from the time the first written testimonies are known. Sociolinguistic models suggest that the fixture of a language, especially in formal contexts, involves the freezing of lexicon and grammar. Therefore, ClM certainly exposes some archaic forms in its basic use as a courtly language, a *lingua franca* of the elites from the Gulf coast to the Caribbean[1015]. Still, ClM was never static or fossilised, but was always subject to change by the spoken language. With the further furcation of pCh, we find scarce but firm evidence of language change also reflected in the inscriptions, also from languages outside the Ch'olan branch. While Tzeltalan remains weak, Yukatekan leaves strong traits. These influ-

[1015] But what appears to the modern epigrapher as 'Classic Mayan' is not always formal language, but sometimes finds genuine utterances of a *sermo vulgaris*. One example is the insulting speech of the rabbit to God L on vessel K1398, E1-H3 (Beliaev and Davletshin 2006: 25): *pul-u a-jol utz'-u a-witz k'ul-is pah+at*, "Rip your head off, smell your piss, [you] dick, *Pah-At*!" Another case of a less regal behaviour is the speech of the 'Fat Cacique' on K1453, H1-K2 to the courtier in front of the bench, sipping from a yellow liquid from a bowl: *bal-Ø wix utz-Ø uk' yab*, "The content [is] piss, it [is] good to drink much [of it]." The narrative context and tone of these rare examples of direct speech also rectify the vulgar English translation. Also note that the Vulgar Latin of graffiti or surfacing in plays is far away from the style of a Roman orator. The characteristics in its latest stage also gave way for the development of the Romance languages (sometimes equalled with the reconstructed proto-Romance).

ences also mirror a certain socio-linguistic status of ClM. It also allows us to define certain 'regiolects' of ClM: with 'narrow vernaculars' for WCh and ECh because of their close relationship, while especially pYu almost creolised the ClM high variety in Yucatan. Still, more granular data are needed to achieve a better definition of these areas of different high varieties and to determine their extent in a diachronic perspective. The historical development of Classic Mayan in this respect is likely not overly different to the development of Middle Egyptian over New Egyptian into Ptolemaic Egyptian, but different to Classic Latin compared with Medieval and New Latin. Such view is an alternative to the 'Classic Ch'olti'an' model based on language change as observed in other written languages, but also a different view of the historical development of the Ch'olan branch. This study has investigated some secure and potential cases of Ch'olan language development mirrored in the inscriptions. While we have a good reconstruction of pCh, ECh and especially WCh are less investigated by methods of historical linguistics. Epigraphy would well benefit from efforts in this direction, also to provide confirmation to linguistic models by written evidence.

Linguistically, two major foci have been laid on Mayan historical linguistics: the reconstruction of (1) a lexicon, and (2) the morphology of proto-languages. Less of concern, but especially important for the historical configuration of ClM, have been all aspects of phonology. As the hieroglyphic writing fixes spoken languages, whether it be the standardised high variety of ClM, any of its regiolects or vernacular influence, *all* characteristics of spoken language should be taken more into account to possibly explain orthographic patterns and deviations.

Too often, the perception prevails that the analytical step of transcription provides a 'genuine' ClM reading and pronunciation, but it simply remains a mere morphology-driven reconstruction based on the transliteration. It is a mutual task of historical linguistics and epigraphy to determine the intent of orthography in the step in between transliteration and transcription: being (1) an analytical way of spelling out the morphology or (2) a phonological way to represent spoken premises. As it was shown in various instances of the showcase discussion, the orthography has a varying depth to one or the other extreme on the scale. The application of standardised spelling patterns is more towards a supragraphematic, analytical way of spelling; while certain features of the spoken language can only be derived from less accentuated spelling conventions, such as synharmony at morpheme boundaries to indicate vowel syncope or allophonic variation, or possible instances of an echo vowel.

The epigraphic crystallisation of the mutual dependencies between language and orthography tangle again the discussion about descriptive and prescriptive features. Statistical methods prove a certain prescriptivity among the ancient scribes, but there are also no rules without exceptions. As epigraphy is reconstructive and therefore descriptive within the academic environment, both views must be combined as well under a definition of probability.

This study follows a traditional understanding of probability by applying statistical methods, but also a frequentistic approach. While the latter is purely descriptive by providing figures, statistical methods to determine the significance are assuming a prescriptive orthography, when we accept a standard spelling by calculating a lower bound within a corpus. This points to a certain normativity in Maya orthography, as other spelling patterns are still tolerable. To further test out the credibility of the preferred spelling practices, especially with regard to a spatial and geographic distribution, the corpus samples need to be compared with a propensity probability (Popper 1959) to determine the measure of a tendency towards a specific spelling pattern. Only to some extant has this aspect here been tangled by the introduction of diversity indices as a quantifier.

Even more intriguing, also with regards to the research history, would be a comparison to Bayesian probabilities (the 'degree of belief') for certain grammatical reconstructions (via the transcription and morphological segmentation of a hieroglyph) in the previous epigraphic literature. How good were previous analyses based on the transcription just with linguistic data and educated *a priori* guesses, but without the backing by statistical figures that determined orthographic patterns? Each of these definitions of probabilities just emphasises a different interpretation of the data, but combining them would be a highly recommended epistemic endeavour.

5.3 – Objectives

FOR THE INVESTIGATION OF CLASSIC MAYAN orthography and its underlying phonemics, three basic objectives were initially set up to provide a framework for approaching the scope of this study: (1) methodology, (2) hypotheses and their analytical testing, and (3) the interpretative discussion. While the previous chapter focused more on how the desiderata were closed by the results of the study, I will here evaluate how well the chosen approach delivered my results.

(1) *Methodology*: An evaluation of the parameters for data base outlined in Chapter 2 has already been outlined in Chapter 3.3.1, so a broader perspective is provided. While the goal of a broadest possible data collection was not matched by the availability of source materials, the database nevertheless comprises an extensive empirical and statistically significant amount. Yet, even with such a broad data base and a large set of meta data to parametrise each sample, the criticised 'impressionistic approach' still prevails, but under different conditions. As before, the data interpretation is based on a 'degree of belief', but the personal or intuitive factor diminishes, and the interpretative conclusions may thus only be biased by the statistical tests chosen and by the linguistic data available.

(2) *Hypotheses/Analyses*: Four showcase groups had initially been set up to subdivide the alternative hypothesis of a preference for vowel-integrating suffix spellings into similar test and control groups. These were of course based on the state of research, when the hypothesis formulation took place and the study was started. As the data compilation of the linguistic foundations indicated and the epigraphic data collection and its statistical analyses later proved, the situation is much more diverse. Although base morphemes may have an identical phonological structure, the allophonic and morphophonemic variation can be quite

complex. The orthographic indication, i.e. the affixation pattern, is also largely decoupled from the actual phonology, while the principle of vowel-integration at morphemic boundaries (if exercised) is quite constant. But in the end, it is to question, whether the approach to consider specific orthographic alternations as specific spelling schemes is too mechanistic. A simple attribution may neglect a deeper review of such spellings in their context, as for example the entire range of underspellings demonstrates. At least, the chosen analytical approach delivers a results that certainly serves as a start for further discussions.

(3) *Discussions/Interpretations*: With respect to the desiderata, the thesis provides a variety of insights that either confirm the current research, provide alternative suggestions, or add hitherto unrecognised patterns. The analyses and their discussion also do not end with the 'traditional' pillars of Mayan epigraphic linguistics, which are lexical and morphological features, with graphematic and phonological questions to a certain extent. In varying degrees, the thesis adds an interdisciplinary perspective, such as on comparative and typological grammatology, corpus and quantitative linguistics, and socio- and psycholinguistics.

The objectives achieved and even those not achieved open the door for a new understanding of Maya epigraphy and Mayan historical linguistics. The way of how these fields are being researched are about to change, a change that ramifies into more specific issues, at the same making these fields broader.

6 – Conclusions

"…like the Babylonian finger on the wall, to be spelling out the letters of my judgment…"
Robert Louis Stevenson, 1886: Strange Case of Dr Jekyll and Mr Hide, Chapter 10

What are the letters of judgement to be written at the end of this study? In a nutshell, I can simply replicate the introductory quote from the preface. All what was possible to talk about, has been written. All what remained in the murky waters of future research was not entirely left out and concealed, but restricted to a reasonable amount of speculation. At least, further questions were raised for epigraphic and linguistic studies to come. This conclusion reviews Maya epigraphy and Mayan linguistics where it stands now, what contribution this study makes, and what future research may look like. I also refer to reviews and syntheses by other authors (Bricker 2007, Houston 2000, Wichmann 2006a) in the field.

6.1 – Epigraphy

Maya epigraphy has long concentrated on the graphemic lexicon, the definition of sign classes and functions, as well as the decipherment of graphemes. Of course, this is the necessary fundamental research before the field can evolve and further research questions can be asked. Besides the phonemic decipherment and its domino effect on new readings (e.g. Stuart 1987) and interpretations that are noted in a vast amount of literature, it was a calendrical and semantic deduction process that pointed to a historical content of Classic inscriptions (Proskouriakoff 1960). Of course, decipherments always require a correlation with linguistic data, but especially rely on lexical items. The perception of a genuine Maya historiography added a strong philological component to large parts of epigraphy, making it more an auxiliary science to reconstruct the socio-politics of the Maya area. Without doubt, epigraphy fulfils an important role in this respect

Apart from the initiatives of linguists (and epigraphers likewise) to work with the hieroglyphic material (see below), a new school of thought developed in the late 1990s. Its scholars pursued new ways of understanding the hieroglyphic system and broadened the perspectives, also by including linguistic data. Several important works (e.g. Grube 2004d, Houston, Robertson and Stuart 2001b, Houston, Stuart and Robertson 1998, Lacadena and Wichmann 2005b, Mora-Marín 2008) first touched grammatological questions such as a more granular view on the sign properties and especially specific orthographic mechanisms. Beyond doubt, this study would not have been possible without standing on the shoulders of these giants of previous research.

Yet, previous studies remained isolated approaches to describe and potentially explain certain characteristics. A unified grammatological perspective was never applied to Maya epigraphy. The present thesis was also only able to touch certain aspects, although in an extensive manner. But with the main scope focused on the orthographic interdependency at morpheme boundaries, a domino effect was unleashed as well. The investigation of orthographic conventions under reciprocal consideration of the (reconstructed) phonology of Classic Mayan has to include a broader perspective to provide explanatory patterns. As discussed in several instances, this comprises grammatology in a comparative and typological perspective. This ideally would embed Maya epigraphy into an interdisciplinary context, where specialists on other writing systems could contribute their expertise. But more than that, a cognitive point of view must be applied as well for socio- and psycho-linguistic questions, bringing research on the writing system beyond mere grammatology. This will of course be beneficial for the historical part of Maya epigraphy as well as all other philological aspects, such as the study of religion.

A better understanding of the working mechanisms of the writing system fosters a better reading ability of the epigrapher and facilitates his work on whatever topic. These insights are also required for the linguistic part, especially as Classic Mayan (as the subsuming term for regional varieties and vernaculars) is the inseparable combination between a specific writing system and a specific script. While the content of hieroglyphic texts may be unlocked even with a limited linguistic knowledge, research on the language(s) of the hieroglyphs can not.

6.2 – Linguistics

THE FIRST TRUE DEBATE ON Mayan linguistics and its potential for hieroglyphic decipherment dates back to the late 1970s with a series of publications (Bricker 1986, Fox and Justeson 1980, Justeson and Campbell 1984) that correlated linguistic materials with epigraphic evidence. Together with the advances in other areas of Maya epigraphy, the linguistic component saw a boost from the late 1990s on, with numerous publications (e.g. Houston, Robertson and Stuart 2000, 2001b, Lacadena 2000a, 2003, Lacadena and Wichmann 2002, 2005a, Mora-Marín 2009, Stuart, Houston and Robertson 1999, Wichmann 2004c) again providing a solid fundament for the research carried out in this study.

As we deal with an extinct writing system recording an extinct language, epigraphy relied on the results of historical linguistics in the past and still has to do so. For the proto-languages resulting from this research, sometimes competing proposals in terms of lexicon, grammar, and even language affiliation exist. Yet, epigraphy provides its own evidence which only must be retrieved and interpreted in the correct way – with the support of data from historical linguistics and in doubt against it. The situation in the Maya area is parallel to the problem with Vulgar Latin sociolects as the actual spoken and recorded languages across the Roman Empire that developed into the different Romance languages, it equals Classic Mayan and its regiolects. On the other hand, proto-Romance (equalling proto-Ch'olan) is the reconstructed language, forward from Classic Latin and backwards from Romance languages via their antecedents (e.g. proto-Hispano-Romance). Both domains do not need to be identical and cannot be where theory meets a diverging reality.

Based on the epigraphic record, a comprehensive (etymological) lexicon and grammar of Classic Mayan is still lacking. Likewise, reconstructive approaches beyond these linguistic features have not yet been realised. One desideratum is the phonology, which would contribute to questions such as the Classic Mayan vowel system, but also psycho-linguistic aspects in possible interdependency with grammatological emanations. Linguistics has largely ignored the discussion of epigraphic evidence, chiefly because of the hieroglyphic writing system. With a centralised data base of transliterated and transcribed texts, linguists would have easier access to Classic Mayan and pursue comparative studies with other Mayan languages or research specific topics, such as how complex sentences are formed.

For the most part, Classic Mayan linguistics was an epigrapher's necessity to comprehend texts for other studies, particularly of historical and political scope. Only in isolated cases have epigraphers and linguists advanced the aspect of language in collaborative studies, and especially with morphological studies. But a holistic view of Classic Mayan with all its variations is perhaps the most important challenge of epigraphic and linguistic research.

6.3 – Outlook

The conclusions drawn on the basis of the research and insights of this study thus evoke a more interdisciplinary approach in the future. As far as the language is concerned, dedicated specialists for all epigraphic and linguistic facets are required: comparative linguistics, quantitative and computational linguistics, researcher on single Mayan languages, typologists for linguistics and graphematics, as well es epigraphers and grammatologists from other disciplines. The insights gained from such narrow and granular research topics will also help the epigraphically working Mayanist to better interpret the texts. The study of Maya hieroglyphs has to diversify, no epigrapher can be a generalist any more, with so many new perspectives opening up, where meticulous and detailed research is required for special issues.

One of the most promising research areas for Maya epigraphy and Mayan linguistics are the digital humanities. As aimed for by the *Textdatenbank und Wörterbuch des Klassischen Maya* project, a digital archive of inscriptions (as the physical object) and the hieroglyphic texts (as the medium of communication), indexed by a sophisticated meta data ontology provides a powerful set of 'big data'. Researchers of any specialisation may query the data according to their questions, explore data sets, correlate multivariate data, and eventually visualise the results. Such easy access can help to decipher hitherto unreadable graphemes, concordances may specify the semantic domain of a lexeme, parametrised data may help to trace vernacular spreads over time, prosopographies can easily be compiled, or socio-politic network analyses can be conducted and visualised.

New tools may also require new methods, and the impact of the digital humanities on the field of Maya studies (which is not limited to epigraphy and linguistics) is currently still beyond experience. About six decades before this research took place, epigraphy saw the dawn of revolution when the phonemic approach of decipherment was first laid out. Since then, epigraphy and linguistics have advanced in an enormous way. This study, although still in a limited way, is one of the first to ever have applied aspects of corpus and quantitative linguistics to approach grammatological research questions and correlate these in an interdisciplinary manner. As computational methods allow to pioneer new sets of data, as Maya studies turn digital, a new revolution is about to take place.

To think I did all that
And may I say – not in a shy way
Oh no, oh no, not me – I did it my way

Paul Anka, 1968: My Way, performed by Frank Sinatra, 1969

APPENDIX A – LINGUISTIC SIGNS AND ABBREVIATIONS

The signs used for the graphematic and linguistic analysis follows Dürr and Schlobinski (1994). The abbreviations for the morphological and syntactic analysis are oriented after the *Leipzig Glossing Rules* (Comrie, Haspelmath and Bickel 2004), adapted for the grammatical morphemes of Classic Mayan after Wichmann (2004c: 451-452) and specific necessities.

General Linguistic Symbols

<>	grapheme(s)	Ø	zero phoneme / morpheme
//	phoneme(s)	#	juncture
[]	phone(s)	/	provided that / in the context
{}	either or	[±]	feature constraint
()	optional	~	alternative
>	realised as, develops to	*	reconstructed
<	derives from, develops from	**	incorrect / impossible / not attested
C, V	consonant, vowel	?	doubtful
√	root morpheme		

Morphological Abbreviations

1	first person	INTR	intransitive
2	second person	INTRS	intransitiviser
3	third person	INSTR	instrumental
ABS	absolutive (pronoun)	LOC	locative (toponymic)
ABSL	absolutive (noun)	MED	mediopassive
ABSTR	abstractive	N	non-
ADJ	adjective	NEG	negation, negative
ADJS	adjectiviser	NMLS	nominaliser
ADV	adverb(ial)	NOUN	noun
AFF	affective	NUM	numeral
AGN	agentive	PFV	perfective
ANTIP	antipassive	PL	plural
ASSUM	assumptive	PAR	particle
ATTR	attributive	PASS	passive
BEN	beneficative	POS	positional
CAUS	causative	POSS	possessive
CEL	celeritive	POT	potential
CLF	classifier	PREP	preposition
COM	completive	PRF	perfect
D	derived	PRS	present
DEM	demonstrative	PRT	preterite
DEP	dependent	PST	past
DISC	discourse marker	PTCP	participle
ERG	ergative	R	root
EXH	exhortative	REFL	reflexive
FAC	factive	RES	resultative
FUT	future	SG	singular
GER	gerund	STAT	stative
HAB	habituative	SBJV	subjunctive
IMP	imperative	TEMP	temporal deictic enclitic
IPVF	imperfective	THEM	thematic suffix
INC	incompletive	TR	transitive
INCH	inchoative	VER	verb
IND	indicative	VERB	verbaliser
INF	infinitive	VERS	versive

Morphological Separators

-	morpheme	.	portmanteu morpheme
=	enclitic	<>	infix
+	compound		

Syntactic Labels

ADVERB	adverbial phrase	PRED	predicate (verbal/stative)
AGENT	agent (subject)	PREP	prepositional phrase
PATIENT	patient (direct object)		

APPENDIX B – LANGUAGE ABBREVIATIONS

The abbreviations for Mayan languages used in this study generally follow the *Preliminary Mayan Etymological Dictionary* (Kaufman 2003: 38-42) with a few exceptions, and without distinguishing dialects.

AKA	Akateko	pGQ	proto Greater Q'anjobalan
AWA	Awakateko	pGT	proto Greater Tzeltalan
CHJ	Chuj	pIx	proto-Ixilean
CHL	Ch'ol	pKi	proto-K'ichee'an
CHN	Chontal	pKo	proto-Kotoke
CHR	Ch'orti'	pM	proto-Mayan
CHT	Ch'olti'	pMa	proto-Mamean
ClM	Classic Mayan	POP	Popti' (Jacalteco)
CM	Central Mayan (WM + EM)	pPQ	proto Poqom-Q'eqchi
EM	Eastern Mayan (GM + GK)	pQa	proto Q'anjobalan
GLL	Greater Lowland Mayan (Yu + GTz)	PQM	Poqomam
GQa	Greater Q'anjobalan (CT + Qa)	pTz	proto-Tzeltalan
GTz	Greater Tzeltalan (Ch + Tz)	pUK	proto Uspanteko-K'ichee'an
ITZ	Itzaj	pWa	proto-Wastekan
IXL	Ixil	pWM	proto Western Mayan
KAB	Kabil (Chicomuselteco)	pYu	proto-Yukatekan
KAQ	Kaqchikeel	QAN	Q'anjobal
KCH	K'ichee'	QEQ	Q'eqchi
LAK	Lakantun	SAK	Sakapulteko
LL	Lowland Mayan (Yu + Ch)	SIP	Sipakapense
MAM	Mam	TEK	Teko
MCH	Mocho (Motozintleco)	TOJ	Tojol
MOP	Mopan	TUZ	Tuzanteco
pCh	proto-Ch'olan	TZE	Tzeltal
PCH	Poqomchi'	TZO	Tzotzil
pCM	proto Central Mayan	TZU	Tz'utujiil
pCT	proto-Chujean	USP	Uspanteko
pEM	proto Eastern Mayan	WAS	Wasteko
pGK	proto Greater K'ichee'an	WM	Western Mayan (GTz + GQ)
pGM	proto Greater Mam	YUK	Yukatek

APPENDIX C – ANALYSES FIGURES AND DATA BASE SAMPLES

This appendix will provide all figures that were retrieved from the statistical analyses conducted in Chapter 3.3. Section C1 presents the figures for the entire set of samples, as shown in Figure 19. Section C2 provides the figures for each test and control group (Figures 23-40), and subdivides into the showcase codes and individual suffix functions, as shown in Table 4. Section C3 provides an excerpt of the database parameters as shown in Table 5 for all samples, sorted by decipherment premise (interpretation, reading, full decipherment) and lemma.

C1 – Entire Sample Set Figures

	Total		**Group 1**		**Group 2**		**Group 3**		**Group 4**	
	n	%	n	%	n	%	n	%	n	%
General Parameters										
N_S	3890	100.00	1923	49.43	1869	48.05	44	1.13	54	1.39
N_M	2238	57.53	412	21.42	1752	93.74	44	100.00	30	55.56
Statistical Values										
μ_x		117.88		113.12		186.90		22.00		13.50
D_i		195.95		178.62		247.78		2.00		14.12
D_i **min.**		-78.07		-65.50		-60.88		20.00		-0.62
D_i **max.**		313.83		291.73		434.68		24.00		27.62

Spelling Schemes

	Group 1																
	a.i	**a.ii**	**b.i**	**b.ii**	**c.i**	**c.ii**	**d.i**	**d.ii**	**e.i**	**e.ii**	**e.iii**	**e.iv**	**f.i**	**f.ii**	**f.iii**	**f.iv**	**g.i**
n	405	252	660	10	33	11	9	6	15	12	4	42	10	231	21	3	198
%	10.4	6.5	17.0	0.3	0.9	0.3	0.2	0.2	0.4	0.3	0.1	1.1	0.3	5.9	0.5	0.1	5.1

	Group 2									
	a.i	**b.i**	**c.i**	**d.i**	**e.i**	**e.ii**	**f.i**	**f.ii**	**g.i**	**g.ii**
n	27	6	14	5	690	592	0	299	24	213
%	0.7	0.2	0.3	0.1	17.7	15.2	0.0	7.7	0.6	5.5

	Group 3			**Group 4**			
	a.i	**a.ii**		**a.i**	**a.ii**	**a.iii**	**a.iv**
n	24	20		36	2	15	1
%	0.6	0.5		0.9	0.1	0.5	0.0

C2 – Suffix Function-based Figures

C2.1 – Test Group 1: Suffix *–aj*

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	1407	100.00	836	59.42	548	38.95	0	0.00	23	1.63
N_M	763	54.23	281	33.61	475	86.68	0	0.00	7	30.43
Statistical Values										
μ_x		42.64		49.18		54.80		0.00		5.75
D_i		83.81		88.58		93.97		0.00		7.08
D_i min.		-41.17		-39.40		-39.17		0.00		-1.33
D_i max.		126.45		137.76		148.77		0.00		12.83

Spelling Schemes

	Group 1 a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	236	4	266	3	19	4	5	1	3	3	3	16	9	212	1	3	48
%	16.8	0.3	18.9	0.2	1.4	0.3	0.4	0.1	0.2	0.2	0.2	1.1	0.6	15.1	0.1	0.2	3.4

	Group 2 a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	26	2	10	0	314	20	0	132	13	31
%	1.8	0.1	0.7	0.0	22.3	1.4	0.0	9.4	0.9	2.2

	Group 3 a.i	a.ii	Group 4 a.i	a.ii	a.iii	a.iv
n	0	0	18	2	2	1
%	0.0	0.0	1.3	0.1	0.1	0.1

C2.1.1 – Thematic Passive / Mediopassive Marker (1PASS)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	1041	100.00	629	60.42	392	37.66	0	0.00	20	1.92
N_M	434	41.69	98	15.58	330	84.18	0	0.00	6	30.00
Statistical Values										
μ_x		31.55		37.00		39.20		0.00		5.00
D_i		65.42		68.94		73.74		0.00		6.40
D_i min.		-33.88		-31.94		-34.54		0.00		-1.40
D_i max.		96.97		105.94		112.94		0.00		11.40

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	210	2	139	2	14	4	3	1	2	3	2	5	9	198	0	2	33
%	20.2	0.2	13.4	0.2	1.3	0.4	0.3	0.1	0.2	0.3	0.2	0.5	0.9	19.0	0.0	0.2	3.2

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	15	2	1	0	253	19	0	67	13	22
%	1.4	0.2	0.1	0.0	24.3	1.8	0.0	6.4	1.2	2.1

Group 3	a.i	a.ii
n	0	0
%	0.0	0.0

Group 4	a.i	a.ii	a.iii	a.iv
n	16	2	2	0
%	1.5	0.2	0.2	0.0

C2.1.2 – Intransitive Positional Marker (1POS)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	15	100.00	1	6.67	14	93.33	0	0.00	0	0.00
N_M	14	93.93	0	0.00	14	100.00	0	0.00	0	0.00
Statistical Values										
μ_x		0.45		0.06		1.40		0.00		0.00
D_i		1.52		0.24		2.50		0.00		0.00
D_i min.		-1.06		-0.18		-1.10		0.00		0.00
D_i max.		1.97		0.29		3.90		0.00		0.00

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
%	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	3	0	0	0	3	0	0	8	0	0
%	20.0	0.0	0.0	0.0	20.0	0.0	0.0	53.3	0.0	0.0

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	0	0	0	0
%	0.0	0.0	0.0	0.0	0.0	0.0

C2.1.3 – Derivational Inchoative Suffix (1INCH)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	331	100.00	201	60.73	128	38.67	0	0.00	2	0.60
N_M	302	91.24	183	91.04	118	92.19	0	0.00	1	50.00
Statistical Values										
μ_x		10.03		11.82		12.80		0.00		0.50
D_i		24.60		29.43		21.31		0.00		0.87
D_i min.		-14.57		-17.61		-8.51		0.00		-0.37
D_i max.		34.63		41.26		34.11		0.00		1.37

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	26	1	126	1	1	0	2	0	1	0	1	11	0	14	1	1	15
%	7.9	0.3	38.1	0.3	0.3	0.0	0.6	0.0	0.3	0.0	0.3	3.3	0.0	4.2	0.3	0.3	4.5

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	6	0	2	0	53	1	0	57	0	9
%	1.8	0.0	0.6	0.0	16.0	0.3	0.0	17.2	0.0	2.7

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	2	0	0	0
%	0.0	0.0	0.6	0.0	0.0	0.0

C2.1.4 – Absolutive Noun Marker (1ABSL)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	20	100.00	5	25.00	14	70.00	0	0.00	1	5.00
N_M	13	65.00	0	0.00	13	92.86	0	0.00	0	0.00
Statistical Values										
μ_x		0.61		0.29		1.40		0.00		0.25
D_i		1.59		0.96		2.42		0.00		0.43
D_i min.		-0.99		-0.66		-1.02		0.00		-0.18
D_i max.		2.20		1.25		3.82		0.00		0.68

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
%	0.0	5.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	2	0	7	0	5	0	0	0	0	0
%	10.0	0.0	35.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	0	0	0	1
%	0.0	0.0	0.0	0.0	0.0	5.0

C2.2 – Control Group 1: Suffix *–el*

	Total n	%	Group 1 n	%	Group 2 n	%	Group 3 n	%	Group 4 n	%
General Parameters										
N_S	343	100.00	135	39.36	195	56.85	0	0.00	13	3.79
N_M	243	70.85	50	37.04	181	92.82	0	0.00	12	92.31
Statistical Values										
μ_x		10.39		7.94		19.50		0.00		3.25
D_i		27.06		15.16		43.33		0.00		5.63
D_i min.		-16.66		-7.21		-23.83		0.00		-2.38
D_i max.		37.45		23.10		62.83		0.00		8.88

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	49	5	0	0	0	0	2	1	11	0	0	24	0	0	0	0	43
%	14.3	1.5	0.0	0.0	0.0	0.0	0.6	0.3	3.2	0.0	0.0	7.0	0.0	0.0	0.0	0.0	12.5

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	144	9	0	0	0	42
%	0.0	0.0	0.0	0.0	42.0	2.6	0.0	0.0	0.0	12.2

	Group 3 a.i	a.ii	Group 4 a.i	a.ii	a.iii	a.iv
n	0	0	0	0	13	0
%	0.0	0.0	0.0	0.0	3.8	0.0

C2.2.1 – Part/Whole Possession Marker (1POSS)

	Total		Group 1		Group 2		Group 3		Group 4	
	n	%	n	%	n	%	n	%	n	%
General Parameters										
N_S	141	100.00	9	6.38	132	93.62	0	0.00	0	0.00
N_M	138	97.87	7	77.78	131	99.24	0	0.00	0	0.00
Statistical Values										
μ_x		4.27		0.53		13.20		0.00		0.00
D_i		17.80		1.42		30.45		0.00		0.00
D_i min.		-13.52		-0.89		-17.25		0.00		0.00
D_i max.		22.07		1.95		43.65		0.00		0.00

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	1	0	0	0	0	0	1	1	6	0	0	0	0	0	0	0	0
%	0.7	0.0	0.0	0.0	0.0	0.0	0.7	0.7	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	102	6	0	0	0	24
%	0.0	0.0	0.0	0.0	72.3	4.3	0.0	0.0	0.0	17.0

	Group 3			Group 4			
	a.i	a.ii		a.i	a.ii	a.iii	a.iv
n	0	0		0	0	0	0
%	0.0	0.0		0.0	0.0	0.0	0.0

C2.2.2 – Attributive Nominal Suffix (1ATTR)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	202	100.00	126	62.38	63	31.19	0	0.00	13	6.44
N_M	105	51.98	43	34.13	50	79.37	0	0.00	12	92.31
Statistical Values										
μ_x		6.12		7.41		6.30		0.00		3.25
D_i		13.27		15.04		13.04		0.00		5.63
D_i min.		-7.15		-7.63		-6.74		0.00		-2.38
D_i max.		19.39		22.45		19.34		0.00		8.88

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	48	5	0	0	0	0	1	0	5	0	0	24	0	0	0	0	43
%	23.8	2.5	0.0	0.0	0.0	0.0	0.5	0.0	2.5	0.0	0.0	11.9	0.0	0.0	0.0	0.0	21.3

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	42	0	0	0	0	18
%	0.0	0.0	0.0	0.0	20.8	0.0	0.0	0.0	0.0	8.9

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	0	0	13	0
%	0.0	0.0	0.0	0.0	6.4	0.0

C2.3 – Test Group 2: Suffix $-V_1w$

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	579	100.00	242	41.80	334	57.69	0	0.00	3	0.52
N_M	344	59.41	27	11.16	316	94.61	0	0.00	1	33.33
Statistical Values										
μ_x		17.55		14.24		33.40		0.00		0.75
D_i		44.00		32.86		64.10		0.00		1.30
D_i min.		-26.46		-18.63		-30.70		0.00		-0.55
D_i max.		61.55		47.10		97.50		0.00		2.05

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	110	40	1	0	0	0	0	0	0	0	1	0	0	0	0	0	90
%	19.0	6.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	15.5

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	203	102	0	3	1	25
%	0.0	0.0	0.0	0.0	35.1	17.6	0.0	0.5	0.2	4.3

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	3	0	0	0
%	0.0	0.0	0.5	0.0	0.0	0.0

C2.3.1 – Root Transitive Marker / Non-CVC Transitive Marker (2IND)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	367	100.00	176	47.96	189	51.50	0	0.00	2	0.54
N_M	202	55.04	19	10.80	183	96.83	0	0.00	0	0.00
Statistical Values										
μ_x		11.12		10.35		18.90		0.00		0.50
D_i		27.54		23.62		37.72		0.00		0.87
D_i **min.**		-16.42		-13.27		-18.82		0.00		-0.37
D_i **max.**		38.66		33.98		56.62		0.00		1.37

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	66	32	0	0	0	0	0	0	0	0	1	0	0	0	0	0	77
%	18.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	21.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	4	119	60	0	0	1	5
%	0.0	0.0	0.0	1.1	32.4	16.3	0.0	0.0	0.3	1.4

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	2	0	0	0
%	0.0	0.0	0.5	0.0	0.0	0.0

C2.3.2 – Derivational Antipassive Suffix (2ANTIP)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	218	100.00	66	30.28	151	69.27	0	0.00	1	0.46
N_M	157	72.02	9	13.64	147	97.35	0	0.00	1	100.00
Statistical Values										
μ_x		6.61		3.88		15.10		0.00		0.25
D_i		17.03		9.95		26.05		0.00		0.43
D_i min.		-10.42		-6.06		-10.95		0.00		-0.18
D_i max.		23.63		13.83		41.15		0.00		0.68

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	40	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
%	18.3	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	1	2	0	83	42	0	3	0	20
%	0.0	0.5	0.9	0.0	38.1	19.3	0.0	1.4	0.0	9.2

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	1	0	0	0
%	0.0	0.0	0.5	0.0	0.0	0.0

C2.4 – Control Group 2: Suffix –V_1y

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	536	100.00	52	9.70	476	88.81	0	0.00	8	1.49
N_M	485	90.49	6	11.54	473	99.37	0	0.00	6	75.00
Statistical Values										
μ_x		16.24		3.06		47.60		0.00		2.00
D_i		65.98		9.79		113.08		0.00		3.46
D_i min.		-49.74		-6.73		-65.48		0.00		-1.46
D_i max.		82.22		12.85		160.68		0.00		5.46

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	4	42	1	0	0	1	1	0	0	2	0	0	0	0	1	0	0
%	0.7	7.8	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	1	0	1	0	19	383	0	15	0	57
%	0.2	0.0	0.2	0.0	3.5	71.5	0.0	2.8	0.0	10.6

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	8	0	0	0
%	0.0	0.0	1.5	0.0	0.0	0.0

C2.4.1 – Derivational Mediopassive Suffix (2MED)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	516	100.00	47	9.11	465	90.12	0	0.00	4	0.78
N_M	471	91.28	5	10.64	464	99.78	0	0.00	2	50.00
Statistical Values										
μ_x		15.64		2.76		46.50		0.00		1.00
D_i		64.33		9.35		110.18		0.00		1.73
D_i min.		-48.70		-6.58		-63.68		0.00		-0.73
D_i max.		79.97		12.11		156.68		0.00		2.73

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	3	40	0	0	0	0	0	0	0	2	0	0	0	0	1	0	1
%	0.6	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	0.0	0.2

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	11	373	0	25	0	56
%	0.0	0.0	0.0	0.0	2.1	72.3	0.0	4.8	0.0	10.9

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	4	0	0	0
%	0.0	0.0	0.8	0.0	0.0	0.0

C2.4.2 – Intransitive Marker (2COM)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	12	100.00	3	25.00	8	66.67	0	0.00	1	8.33
N_M	8	66.67	0	0.00	7	87.50	0	0.00	1	100.00
Statistical Values										
μ_x		0.36		0.18		0.80		0.00		0.25
D_i		1.25		0.51		2.09		0.00		0.43
D_i min.		-0.89		-0.34		-1.29		0.00		-0.18
D_i max.		1.61		0.69		2.89		0.00		0.68

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
%	0.0	16.7	0.0	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	1	0	7	0	0	0	0	0
%	0.0	0.0	8.3	0.0	58.3	0.0	0.0	0.0	0.0	0.0

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	1	0	0	0
%	0.0	0.0	8.3	0.0	0.0	0.0

C2.4.3 – Derivational Versive Suffix (2INCH)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	9	100.00	4	44.44	2	22.22	0	0.00	3	33.33
N_M	6	66.67	1	25.00	2	100.00	0	0.00	3	100.00
Statistical Values										
μ_x		0.27		0.24		0.20		0.00		0.75
D_i		0.62		0.42		0.40		0.00		1.30
D_i min.		-0.34		-0.19		-0.20		0.00		-0.55
D_i max.		0.89		0.66		0.60		0.00		2.05

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
%	11.1	11.1	11.1	0.0	0.0	11.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	1	1	0	0	0	0
%	0.0	0.0	0.0	0.0	11.1	11.1	0.0	0.0	0.0	0.0

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	0	0	3	0	0	0
%	0.0	0.0	33.3	0.0	0.0	0.0

C2.5 – Test Group 3: Suffix –*Vb*

C2.5.1 – Derivational Instrumental Suffix (3INSTR)

	Total		Group 1		Group 2		Group 3		Group 4	
	n	%	n	%	n	%	n	%	n	%
General Parameters										
N_S	515	100.00	449	87.18	26	5.05	37	7.18	3	0.58
N_M	67	13.01	14	3.12	16	61.54	37	100.00	0	0.00
Statistical Values										
μ_x		15.61		26.41		2.60		18.50		0.75
D_i		65.33		89.46		4.50		1.50		1.30
D_i min.		-49.72		-63.04		-1.90		17.00		-0.55
D_i max.		80.93		115.87		7.10		20.00		2.05

Spelling Schemes

	Group 1																
	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	3	28	383	4	3	0	0	0	2	0	0	0	0	18	0	0	8
%	0.6	5.4	74.4	0.8	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	3.5	0.0	0.0	1.6

	Group 2									
	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	1	3	0	0	0	0	0	0	8	14
%	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.6	2.7

	Group 3		Group 4			
	a.i	a.ii	a.i	a.ii	a.iii	a.iv
n	17	20	3	0	0	0
%	3.3	3.9	0.6	0.0	0.0	0.0

C2.6 – Control Group 3: Suffix *–Vl*

C2.6.1 – Derivational Nominaliser Suffix (3NMLS)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	38	100.00	27	71.05	0	0.00	7	18.42	4	10.53
N_M	18	47.37	7	25.93	0	0.00	7	100.00	4	100.00
Statistical Values										
μ_x		1.15		1.59		0.00		3.50		1.00
D_i		2.13		2.25		0.00		3.50		1.73
D_i min.		-0.98		-0.66		0.00		0.00		-0.73
D_i max.		3.29		3.84		0.00		7.00		2.73

Spelling Schemes

Group 1	a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	2	6	8	3	0	0	0	2	0	0	0	1	0	1	3	0	1
%	5.3	15.8	21.1	7.9	0.0	0.0	0.0	5.3	0.0	0.0	0.0	2.6	0.0	2.6	7.9	0.0	2.6

Group 2	a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	0	0	0	0	0	0	0
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Group 3 a.i	Group 3 a.ii	Group 4 a.i	Group 4 a.ii	Group 4 a.iii	Group 4 a.iv
n	7	0	4	0	0	0
%	18.4	0.0	10.5	0.0	0.0	0.0

C2.7 – Test Group 4: Suffix *–Vj*

C2.7.1 – Temporal Perfect Marker (4TEMP)

	Total n	Total %	Group 1 n	Group 1 %	Group 2 n	Group 2 %	Group 3 n	Group 3 %	Group 4 n	Group 4 %
General Parameters										
N_S	464	100.00	182	39.22	282	60.78	0	0.00	0	0.00
N_M	303	65.30	27	14.84	276	97.87	0	0.00	0	0.00
Statistical Values										
μ_x		14.06		10.71		28.20		0.00		0.00
D_i		34.36		28.41		46.77		0.00		0.00
D_i **min.**		-20.30		-17.70		-18.57		0.00		0.00
D_i **max.**		48.42		39.11		74.97		0.00		0.00

Spelling Schemes

	Group 1 a.i	a.ii	b.i	b.ii	c.i	c.ii	d.i	d.ii	e.i	e.ii	e.iii	e.iv	f.i	f.ii	f.iii	f.iv	g.i
n	5	123	2	0	12	6	2	1	0	7	0	1	1	0	15	0	7
%	1.1	26.5	0.4	0.0	2.6	1.3	0.4	0.2	0.0	1.5	0.0	0.2	0.2	0.0	3.2	0.0	1.5

	Group 2 a.i	b.i	c.i	d.i	e.i	e.ii	f.i	f.ii	g.i	g.ii
n	0	0	0	1	9	80	0	146	1	45
%	0.0	0.0	0.0	0.2	1.9	17.2	0.0	31.5	0.2	9.7

	Group 3 a.i	a.ii	Group 4 a.i	a.ii	a.iii	a.iv
n	0	0	0	0	0	0
%	0.0	0.0	0.0	0.0	0.0	0.0

C3 – Lexeme-based Sample Tables

This appendix lists all sample tuples from the data base, separated by their lemma, i.e. the lexical basis (root or stem) to which one of the showcase suffixes is attached. The lexemes are organised in three sub-sections, according to the decipherment premises (see Chapter 1.2.1.3): (1) undeciphered glyphs of unknown reading, (2) undeciphered glyphs of partially or fully known reading, and (3) partially or fully deciphered glyphs.

Only a few parameters (see Chapter 2.3.1) are replicated from the data base for a concise overview, as some are only set to facilitate queries. Each table is sorted (1) by the showcase and then (2) by the three-letter provenance code. Each table is organised the following way:

Transliteration	Transcription	Case	Scheme	Monument Reference			Region	Time	Reference
BAK=na=ja	*bak-n-aj-Ø*	1PASS	1.f.ii	TIK	T. 1 Lnt. 3	A6	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)

C3.1 – Undeciphered Glyphs / Unknown Reading

GRASPING.HAND – VER.TR.D

GRASPING.HAND=na=ja	*GRASPING.HAND-n-aj-Ø*	1PASS	1.f.ii	PAL	T21B-E	41	Tabasco	09.15	(Stuart 2006b: 185-186)

DOG.HEAD – VER.TR.R

u=DOG.HEAD=ji=ya	*u-DOG.HEAD=j-Ø=iy*	4TEMP	2.f.ii	TIK	St. 31	F7	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)

FLINT.HAND – VER.TR.R

FLINT.HAND=la-ja	*CV<h>l-aj-Ø*	1PASS	1.a.i	COL	K4930	A1	?	?	(Kerr 1994: 617)
FLINT.HAND=la-ja=ya	*CV<h>l-j-Ø=[i]y*	1PASS	1.a.i	SUF	M. 7	B5	Central Peten	08.17	(Estrada-Belli et al. 2009: fig. 5)
u= FLINT.HAND=wa	*u-CVl-V-Ø*	2IND	2.e.i	TIK	Alt. 7	2	Central Peten	09.19	(Jones and Satterthwaite 1982: fig. 40a)

HEADLESS.BODY – NOUN

HEADLESS.BODY=ba=ja	*HEADLESS.BODY-b-aj-Ø*	1INCH	1.f.ii	PAL	TI-M	H9	Tabasco	09.12	(Robertson 1983b: fig. 96)
HEADLESS.BODY=ta=ja	*HEADLESS.BODY-t-aj-Ø*	1INCH	1.f.ii	TNA	Mon. 161	L1	Chiapas	09.14	(Graham and Henderson 2006: 102)
HEADLESS.BODY=ma=ja	*HEADLESS.BODY-m-aj-Ø*	1INCH	1.f.ii	TRT	Mon. 8	A5b	Tabasco	09.10	(Gronemeyer 2006b: pl. 14)

HERON.FISH – VER.INTR

u=HERON.FISH=le	*u-HERON.FISH-[e]l-Ø*	3NMLS	3.a.i	PAL	T19S	A2a	Tabasco	09.14	(Stuart 2000: fig. 2)
u=HERON.FISH=le	*u-HERON.FISH-[e]l-Ø*	3NMLS	3.a.i	PAL	T19S	D1b	Tabasco	09.14	(Stuart 2000: fig. 2)

u=HERON.FISH=le	*u-HERON.FISH-[e]l-Ø*	3NMLS	3.a.i	PAL	T19S	D3a	Tabasco	09.14	(Stuart 2000: fig. 2)
ta HERON.FISH=le	*ta HERON.FISH-[e]l-Ø*	3NMLS	3.a.i	PAL	T21B-E	31	Tabasco	09.15	(Stuart 2006b: 185-186)

JAGUAR.TITLE – VER.TR

JAGUAR.EYE=li=bi	*JAGUAR.EYE-l-ib*	3INSTR	1.f.ii	COL	MFA 1988.1284	M1	Central Peten	?	(Boot 2009a: fig. 1)
JGU=li=bi	*JGU-l-ib*	3INSTR	1.f.ii	COL	K8088	K1-L1	Central Peten	?	(Boot 2009a: fig. 5b)
JAGUAR.EYE=ni=bi	*JAGUAR.EYE-n-ib*	3INSTR	1.f.ii	NAR	Alt. 2	G3	Central Peten	09.17	(Grube 2004c: fig. 13)
JAGUAR.EYE=ni=bi	*JAGUAR.EYE-n-ib*	3INSTR	1.f.ii	NAR	St. 13	F16	Central Peten	09.12	(Graham and von Euw 1975: 38)
JAGUAR.EYE=ni=bi	*JAGUAR.EYE-n-ib*	3INSTR	1.f.ii	NAR	St. 21	B13	Central Peten	09.13	(Graham and von Euw 1975: 53)
JGU^{yi}=ni=bi	*JGU-n-ib*	3INSTR	1.f.ii	TPX	MV 55	P1-Q1	Central Peten	?	(Fialko 2000: fig. 103)

SPIRAL – VER.TR.D

SPIRAL=wa=ja	*?-w-aj-Ø*	1PASS	1.f.ii	UAX	Str. B-13 R. 7-1	B4	Central Peten	09.00	(Smith 1950: fig. 96)

STAR.WAR – VER.TR.R

2=STAR.WAR=ja	*2-STAR.WAR-[a]j-Ø*	1PASS	2.e.i	PNG	St. 12	D13a	Usumacinta	09.18	(Stuart and Graham 2003: 62)
STAR.WAR=yi ti SEIBAL	*STAR.WAR-[V]y-i-Ø ti SEIBAL*	2MED	2.e.ii	AGT	St. 2	A2	Pasion	09.15	(Graham 1967: fig. 5)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	C Pa.	8b	C1	Yucatan	10.18	(Anders 1968: 8)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	CLK	Frg. 27	1	Central Campeche	09.16	(Simon Martin n.p.)
STAR.WAR=yi=ya	*STAR.WAR-y-Ø=iy*	2MED	2.f.ii	COL	St. Canberra	A5a	Usumacinta	09.17	(Mayer 1991: pl. 101)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	CRC	St. 3	F3a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 3)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	CRC	Str. B16 Stucco	p44	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 E IV	D1a	Pasion	09.12	(Fahsen 2002: fig. 7)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 E V	C2	Pasion	09.12	(Fahsen 2002: fig. 7)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W IV	C1a	Pasion	09.12	(Fahsen 2002: fig. 8)
STAR.WAR=yi=ya	*STAR.WAR-y-Ø=iy*	2MED	2.f.ii	DPL	HS. 2 W IV	B1b	Pasion	09.12	(Fahsen 2002: fig. 8)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W V	D2b	Pasion	09.12	(Fahsen 2002: fig. 8)
STAR.WAR=yi=ya	*STAR.WAR-y-Ø=iy*	2MED	2.f.ii	DPL	HS. 2 W V	B1a	Pasion	09.12	(Fahsen 2002: fig. 8)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W VI	D1	Pasion	09.12	(Fahsen 2002: fig. 8)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	St. 14	K1	Pasion	09.14	(Houston 1993: fig. 3.24)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	DPL	St. 2	pB2	Pasion	09.15	(Houston 1993: fig. 3.28)
STAR.WAR=yi sa	*STAR.WAR-[V]y-Ø sa['-al]*	2MED	2.e.ii	NAR	HS. 1 VI	N1b	Central Peten	09.08	(Graham 1978: 109)
STAR.WAR=yi ELK'IN-ni	*STAR.WAR-[V]y-i-Ø elk'in*	2MED	2.e.ii	PAL	TI-M	G7	Tabasco	09.12	(Robertson 1983b: fig. 96)
tu= STAR.WAR=yi=la	*t-u-STAR.WAR-[V]y-il-Ø*	2MED	2.e.ii	PNG	Trn. 1	E'1	Usumacinta	09.17	(Teufel 2004: 549)
STAR.WAR=yi YAX=a	*STAR.WAR-[V]y-i-Ø yax-a[']*	2MED	2.e.ii	TIK	T. 4 Lnt. 3	B4	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 83	D1	Chiapas	09.16	(Graham and Mathews 1996: 113)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 91	pA1	Chiapas	?	(Graham and Mathews 1996: 119)
STAR.WAR=yi=ya	*STAR.WAR-y-Ø=iy*	2MED	2.f.ii	TRT	Mon. 6	G4	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	UXM	Mon. 1	E2	Yucatan	10.02	(Graham 1992: 122)
STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 10	A4a	Usumacinta	09.18	(Graham and von Euw 1977: 31)

STAR.WAR=yi	*STAR.WAR-[V]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 41	A2	Usumacinta	09.16	(Graham 1979: 91)

STONE.HAND – VER.TR

ja-STONE.HAND-ma=jo=mi	*ja<h>m?-j-om-Ø*	1PASS	2.f.ii	COL	K2068	H1-I1	?	?	(Kerr 1990: 211)
STONE.HAND=na=ja	*STONE.HAND-n-aj-Ø*	1PASS	1.f.ii	PRU	HS. 1		Central Peten	?	(Grube 2004a: fig. 12a)
STONE.HAND=na=ja	*STONE.HAND-n-aj-Ø*	1PASS	1.f.ii	YAX	HS. 2 VII	Q1	Usumacinta	09.15	(Graham 1982: 160)

SUGAR.CONE – VER.TR.D

SUGAR.CONE=na=ja	*SUGAR.CONE-n-aj-Ø*	1PASS	1.f.ii	PUS	HS. 1	8	Mopan-Pusilha	09.18	(Prager 2002a, III: fig. 31)

TUN.SHELL – VER.TR.R

TUN.SHELL=ja	*TUN.SHELL-[a]j-Ø*	1PASS	2.e.i	PNG	Trn. 1	G1	Usumacinta	09.17	(Teufel 2004: 549)
TUN.SHELL=ja	*TUN.SHELL-[a]j-Ø*	1PASS	2.e.i	PNG	Trn. 1	F'4	Usumacinta	09.17	(Teufel 2004: 549)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	BPK	ScS. 1	C2b	Usumacinta	09.13	(Mathews 1980: fig. 9)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	BPK	ScS. 4	D8a	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	BPK	ScS. 5	F7b	Usumacinta	09.16	(Alexandre Safronov n.p.)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	CNC	P. 1	G3	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
TUN.SHELL=yi ka-KAN=la	*TUN.SHELL-[V]y-i-Ø kan-[al*	2MED	2.e.ii	CRN	HS. 2 1-V	B6b	Central Peten	09.14	(Stuart 2012d: fig. 1)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	CRN	HS. 3 VI	B1b	Central Peten	09.14	(Canuto et al. 2008: fig. 2.9)
TUN.SHELL=yi=ya	*TUN.SHELL-y-Ø=iy*	2MED	2.f.ii	PAL	PT	C2	Tabasco	09.14	(Robertson 1985b: fig. 258)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	PAL	T17T	B5	Tabasco	09.12	(González and Fernández Martínez 1994)
TUN.SHELL=yi	*TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	PNG	P. 4	G1	Usumacinta	09.11	(Maler 1901: pl. 32)
i TUN.SHELL=yi	*i['] TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	QRG	St. U	A5	Motagua	09.02	(Looper 2003: fig. 1.5)
i TUN.SHELL=yi	*i['] TUN.SHELL-[V]y-i-Ø*	2MED	2.e.ii	TIK	St. 5	A9	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 7a)

C3.2 – Undeciphered Glyphs / Partial or Full Reading

Cin – VER

?-ni=yi=li	*Cin-iy-il-Ø*	2MED	4.a.i	CPN	St. A	D6b	Motagua	09.14	(Alexander 1988: fig. 1)

Cum – VER.TR

?-mu=yi	*Cum-uy-i-Ø*	2MED	1.a.ii	CRC	Str. B16 Stucco	p18	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)

CVb – VER.TR

?-ba=ja	*CV<h>b-aj-Ø*	1PASS	1.b.i	CRN	HS. 2 XIV	A2	Central Peten	09.14	(Mayer 1987: pl. 67)

?-ba=ja	*CV<h>b-aj-Ø*	1PASS	1.b.i	CRN	P. 1	H8	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)

CVk – POS

?-ku=li=bi	*CVk-l-ib*	3INSTR	1.f.ii	COL	St. New York	F1b	?	09.16	(Mayer 1995: pl. 153)

CVk – VER.TR

?-ka=ja	*CV<h>k-aj-Ø*	1PASS	1.b.i	PAL	T4P1	pB1	Tabasco	09.11	(Robertson 1991: fig. 217)

CVtz' – VER.TR

?-tz'a=ja	*CV<h>tz'-aj-Ø*	1PASS	1.b.i	PNG	Msc. Peabody	B3b	Usumacinta	09.15	(Maler 1901: pl. 11)
?-tz'a=ja	*CV<h>tz'-aj-Ø*	1PASS	1.b.i	TIK	MT. 356	Ap1	Central Peten	?	(Moholy-Nagy 2008: fig. 215f)

CVy – VER.INTR

u=?-ye=la	*u-CVy-el-Ø*	3NMLS	1.b.ii	CPN	St. E	C7	Motagua	09.05	(Schele 1990b: fig. 5b)

haC – VER.TR

ha-?=jo=ma	*ha<h>C-j-om-Ø*	1PASS	2.f.ii	CRN	HS. 2 1-V	G6a	Central Peten	09.14	(Stuart 2012d: fig. 1)

kiC-V – VER.TR.D

ki-?=na=ja	*kiC-n-aj-Ø*	1PASS	1.f.ii	PAL	T21B-E	40	Tabasco	09.15	(Stuart 2006b: 185-186)

nuC – VER.TR

nu-CV=ja	*nu<h>C-(a)j-Ø*	1PASS	4.a.i	DPL	HS. 2 E IV	E2	Pasion	09.12	(Fahsen 2002: fig. 7)

C3.3 – Deciphered Glyphs / Unknown or Probable or Secure Translation

a[h]k't-aj – VER.INTR: "to dance"

AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	AGT	St. 5	D3	Pasion	09.15	(Houston and Mathews 1985: fig. 19)
ti AK'=TAJ	*ti a[h]k't-aj-Ø*	1INCH	1.e.iv	BPK	R. 1-42	A2	Usumacinta	09.17	(Stephen Houston n.p.)
ti AK'=TAJ	*ti a[h]k't-aj-Ø*	1INCH	1.e.iv	BPK	R. 1-21	B1	Usumacinta	09.17	(Stephen Houston n.p.)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	COL	Lnt. Retalteco	A1	Usumacinta	09.16	(Houston et al. 2006b: fig. 2)
[a]AK'=TAJ[ja]	*a[h]k't-aj-Ø*	1INCH	1.e.iv	COL	P. DOAKS 1	E1a	Usumacinta	09.15	(Looper 2009: fig. 1.12)

AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	COL	Lnt. 4 Site R	B2	Usumacinta	09.16	(Mayer 1995: pl. 259)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	COL	Lnt. 5 Site R	A3	Usumacinta	09.16	(Stefanie Teufel n.p.)
AK'-ta=ji	*a[h]k't-aj-Ø*	1INCH	1.a.ii	CPN	K3296	A3	Motagua	09.18	(Kerr 1992: 403)
AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	CPN	K4655	J1	Motagua	09.17	(Linda Schele SD 1041)
i AK'=TAJ	*i['] a[h]k't-aj-Ø*	1INCH	1.e.iv	CRN	P. 2	F4	Central Peten	09.12	(Mayer 1987: pl. 26)
AK'=TAJ^{ja}	*a[h]k't-aj-Ø*	1INCH	1.e.iv	CRN	HS. 3 I	D3	Central Peten	09.13	(Martin and Stuart 2009: 24)
AK'=TAJ^{ja}	*a[h]k't-aj-Ø*	1INCH	1.e.iv	DPL	HS. 1 III	L1	Pasion	09.16	(Houston 1993: fig. 4.16)
AK'=TAJ^{ja}	*a[h]k't-aj-Ø*	1INCH	1.e.iv	DPL	HS. 2 W II	B2	Pasion	09.12	(Fahsen 2002: fig. 8)
i AK'=TAJ^{ja}	*i['] a[h]k't-aj-Ø*	1INCH	1.e.iv	DPL	HS. 2 I	I2	Pasion	09.12	(Houston 1993: fig. 4.11)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	DPL	St. 11	C2	Pasion	09.14	(Houston 1993: fig. 3.27)
AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	DPL	St. 14	F1a	Pasion	09.14	(Houston 1993: fig. 3.24)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	DPL	St. 15	E5	Pasion	09.14	(Houston 1993: fig. 3.25)
ti a-k'a-ta	*ti a[h]k't-a[j]-Ø*	1INCH	1.g.i	EDZ	St. 18	A2-B2	Yucatan	09.12	(Boot 2009b: 22)
^{a}AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	KIN	Mon. 1	A3	Usumacinta	09.18	(Houston et al. 2006a: fig. 6)
ti AJ-AK'	*ti a[h]k'[t-aj]-Ø*	1INCH	2.g.ii	MTL	K1439	D1	Central Peten	09.15	(Robicsek and Hales 1982: fig. 23a)
ti AJ-AK'	*ti a[h]k'[t-aj]-Ø*	1INCH	2.g.ii	MTL	K1452	D1	Central Peten	09.15	(Schele and Miller 1986: pl. 71a)
ti AK'-ta	*ti a[h]k't-a[j]-Ø*	1INCH	1.g.i	MTL	K533	D1	Central Peten	09.15	(Coe 1978: #20)
^{a}AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	NAR	Mace Head	D2	Central Peten	09.17	(Grube 2004c: fig. 10)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	PNG	P. 3	M1	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
a-AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	PNG	St. 8	C'21	Usumacinta	09.14	(Stuart and Graham 2003: 48)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	PSD	Lnt. 4	A3	Usumacinta	09.17	(Stefanie Teufel n.p.)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	QRG	Alt. L	D1	Motagua	09.11	(Looper 2003: fig. 1.20)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	TIK	T. 4 Lnt. 3	G2	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
ti AK'=TAJ	*ti a[h]k't-aj-Ø*	1INCH	1.e.iv	UXL	St. 13	E2	Central Campeche	09.11	(Grube 2008: fig. 8.61)
ti ^{a}AK'-ta	*ti a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 2	F1	Usumacinta	09.16	(Graham and von Euw 1977: 15)
^{a}AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 2	K1	Usumacinta	09.16	(Graham and von Euw 1977: 15)
AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 3	C2b	Usumacinta	09.16	(Graham and von Euw 1977: 17)
^{a}AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 5	B2	Usumacinta	09.16	(Graham and von Euw 1977: 21)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 6	A3	Usumacinta	09.16	(Graham and von Euw 1977: 23)
ti AK'-ta	*ti a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 6	B2	Usumacinta	09.16	(Graham and von Euw 1977: 23)
^{a}AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 7	B2	Usumacinta	09.16	(Graham and von Euw 1977: 25)
a(j)-AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	St. 9	A2	Usumacinta	09.16	(Tate 1992: fig. 126)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 9	A4	Usumacinta	09.16	(Graham and von Euw 1977: 29)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	St. 11	H1b	Usumacinta	09.16	(Tate 1992: fig. 136)
^{a}AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 32	D1	Usumacinta	09.16	(Graham 1979: 73)
ti AK'-ta	*ti a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 33	D1	Usumacinta	09.16	(Graham 1979: 75)
^{a}AK'-ta	*a[h]k't-a[j]-Ø*	1INCH	1.g.i	YAX	Lnt. 42	C2	Usumacinta	09.16	(Graham 1979: 93)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 52	B2	Usumacinta	09.16	(Graham 1979: 113)
^{a}AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 53	B2	Usumacinta	09.13	(Graham 1979: 115)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	YAX	Lnt. 54	A2	Usumacinta	09.16	(Graham 1979: 117)
AK'-ta=ja	*a[h]k't-aj-Ø*	1INCH	1.a.i	ZPB	St. 12	A1	Western Peten	09.12	(Breuil-Martínez et al. 2005: fig. 6)

a[h]n – VER.INTR: "to run"

a-ne=ya	*a[h]n-ey-Ø*	2COM	1.d.ii	JOL	Dwg. B	A3	Tabasco	09.02	(Grube, Martin and Zender 2002: 6)
a-na=bi ch'a-ho=ma	*a[h]n-ab ch'ah-om-Ø*	3INSTR	1.a.ii	BPK	ScS. 5	G1	Usumacinta	09.16	(Alexandre Safronov n.p.)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	COL	K771	L1	?	?	(Robicsek and Hales 1982: #138)
a-na=bi=li	*a[h]n-ab-il-Ø*	3INSTR	1.a.ii	COL	K8123	B2	?	?	n/a
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	COL	P. Houston	D5	Usumacinta	09.03	(Mayer 1989: pl. 27)
ya=a-na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	COL	St. Antwerp	C4	Tabasco	?	(Mayer 1991: pl. 141)
ya=a-na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	COL	St. Antwerp	F5	Tabasco	?	(Mayer 1991: pl. 141)
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	CPN	Alt. Frg.	?	Motagua	?	(Boot 2009b: 24)
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	CRN	HS. 2 XI	A2	Central Peten	09.14	(Sebastian Matteo n.p.)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	LAC	P. 1	D2	Usumacinta	09.15	(Schaffer 1991: fig. 4)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	LAC	P. 1	L5	Usumacinta	09.15	(Schaffer 1991: fig. 4)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	LAC	P. 1	G1	Usumacinta	09.15	(Schaffer 1991: fig. 4)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	NTN	Dwg. 8	B2	Mopan-Pusilha	?	(Stone 1994: fig. 6.47)
a-na=bi=li	*a[h]n-ab-il-Ø*	3INSTR	1.a.ii	NTN	Dwg. 13	D2	Mopan-Pusilha	?	(Stone 1994: fig. 8.13)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	NTN	Dwg. 29	A11	Mopan-Pusilha	09.17	(MacLeod and Stone 1994: fig. 7.8)
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	NTN	Dwg. 29	A12	Mopan-Pusilha	09.17	(MacLeod and Stone 1994: fig. 7.8)
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	NTN	Dwg. 52	B7	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.2)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	NTN	Dwg. 65	J4	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)
ya=na=bi	*y-a[h]n-ab-Ø*	3INSTR	1.a.ii	PNG	Bur. 13 Stucco	A1a	Usumacinta	09.16	(Houston et al. 1998: fig. 3)
a-na=bi	*a[h]n-ab*	3INSTR	1.a.ii	PNG	P. 3	J'1	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
a-na=bi K'UH	*a[h]n-ab k'uh*	3INSTR	1.a.ii	PNG	St. 12	Ap17b	Usumacinta	09.18	(Stuart and Graham 2003: 62)
[a]AN-ne=la	*a[h]n-el*	3NMLS	1.d.ii	RSB	HS. 3 III	12	Quintana Roo	09.04	(Carrasco and Boucher 1987: fig. 6)
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	TIK	MT. 25	C1	Central Peten	09.11	n/a
ya=na=bi=li	*y-a[h]n-ab-il-Ø*	3INSTR	1.a.ii	YAX	Lnt. 46	H3a	Usumacinta	09.14	(Graham 1979: 101)
ya=na=ba=tzi-li	*y-a[h]n-ab-tzil*	3INSTR	1.a.i	YAX	St. 31	A2	Usumacinta	09.15	(Sven Gronemeyer 28-000018)

aj – VER.INTR: "to wake up"

ya=ja=ji-bi	*y-aj-ajib-Ø*	3INSTR	1.f.ii	COL	BRU A.AM 66-14	A1-B1	Central Peten	?	(Boot 2004a: fig. 1)
ya=ja=ji-bi	*y-aj-ajib-Ø*	3INSTR	1.f.ii	COL	PMT 10.422277	D1-E1	Central Peten	?	(Boot 2004a: fig. 2)
ya=ja-la=ji-bi	*y-aj-al-jib-Ø*	3INSTR	1.f.ii	COL	Guatemala	A4-B4	Central Peten	?	(Boot 2005c: 9)
ya=ja=ji-bi	*y-aj-ajib-Ø*	3INSTR	1.f.ii	PNG	Sherd	pA1-pB2	Usumacinta	?	(Houston et al. 1998: fig. 2)
ya=ja-la=ji-bi	*y-aj-al-jib-Ø*	3INSTR	1.f.ii	TIK	MT. 216b	A1-B1	Central Peten	09.15	(Culbert 1993: fig. 51)

ajaw – NOUN: "lord"

AJAW=ja	*ajaw-[a]j-Ø*	1INCH	2.e.i	C Dr.	24	B6	Yucatan	11.04	(Anders and Deckert 1975: 24)
AJAW=ja	*ajaw-[a]j-Ø*	1INCH	2.e.i	QRG	Mon. 26	C7	Motagua	09.02	(Looper 2003: fig. 1.7)
i AJAW=ja	*i['] ajaw-[a]j-Ø*	1INCH	2.e.i	QRG	St. D	D22a	Motagua	09.17	(Looper 2003: fig. 4.28)
AJAW=yi	*ajaw-[a]y-Ø*	2INCH	2.e.ii	TNA	Mon. 126	B4a	Chiapas	09.13	(Graham and Mathews 1999: 155)

ak-ta – VER.TR.D: "to loose, to drop"

ya=ka-ta=ji	*y-ak-t-aj-Ø*	4TEMP	1.f.iii	PNG	Trn. 1	Z5	Usumacinta	09.17	(Teufel 2004: 549)

ak' – VER.TR.R: "to give"

ya=AK'=wa	*y-ak'[-a]-Ø*	2IND	2.e.i	CPN	Mon. 10	Cp2	Motagua	09.15	(Schele 1987e: fig. 2)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	CRC	St. 3	D13b	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	CRC	St. 6	C12	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 7)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	CRN	HS. 3 VIII	C3	Central Peten	09.13	(Canuto et al. 2008: fig. 2.9)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	NAR	HS. 1 IV	H1a	Mopan-Pusilha	09.10	(Graham and von Euw 1975: 108)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	NAR	St. 32	A'1	Central Peten	09.19	(Graham 1978: 86)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	NAR	St. 32	Y5	Central Peten	09.19	(Graham 1978: 86)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	A7	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	D10	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	E11	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	J6	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	K7	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	O4a	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	Q7	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	S10	Tabasco	09.12	(Robertson 1983b: fig. 95)
ma-a ya=k'a=wa	*ma' y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	Q4-R4	Tabasco	09.12	(Robertson 1983b: fig. 95)
ma ya=k'a=wa	*ma['] y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-E	P11	Tabasco	09.12	(Robertson 1983b: fig. 95)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	C5	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	C8	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	F1	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	I4	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	J10	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	K3	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-M	L9	Tabasco	09.12	(Robertson 1983b: fig. 96)
ya=k'a=wa	*y-ak'-a-Ø*	2IND	1.a.i	PAL	TI-W	S11a	Tabasco	09.12	(Robertson 1983b: fig. 97)
ya=AK'=wa	*y-ak'[-a]-Ø*	2IND	2.e.i	PAL	TI-W	J9	Tabasco	09.12	(Robertson 1983b: fig. 97)
ya=AK'=wa	*y-ak'[-a]-Ø*	2IND	2.e.i	PAL	WARP	G5	Tabasco	09.13	(Schele 1990c: fig. 1)

al – VER.TR.R: "to say"

ya=la=wa	*y-al-a-Ø*	2IND	1.a.i	COL	K671	T4	?	?	(Kerr 1989: 32)
wa=la=wa	*[in]w-al-a-Ø*	2IND	1.a.i	COL	K7727	Q4	?	?	(Kerr and Kerr 2000: 1005)
wa=la=wa	*[in]w-al-a-Ø*	2IND	1.a.i	MTL	K793	F4	Central Peten	?	(Kerr 1989: 50)
ya=la=ji	*y-al-aj-Ø*	4TEMP	1.a.ii	COL	K1775	S3	?	?	(Kerr 1989: 109)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	COL	K2026	Q1	?	?	(Kerr 1990: 205)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	COL	K2026	T1	?	?	(Kerr 1990: 205)
ya=la=ji	*y-al-aj-Ø*	4TEMP	1.a.ii	COL	K7727	S1	?	?	(Kerr and Kerr 2000: 1005)

ya=la=ja	*y-al-aj-Ø*	4TEMP	1.a.i	COL	NN	A2	?	?	(Linda Schele SD 4079)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	COL	Shl. Berlin	D1	?	?	(Grube and Gaida 2006: #37)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	COL	Shl. Berlin	D1a	?	?	(Grube and Gaida 2006: Fig. 37.1)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	COL	Shl. Cleveland	C2	?	?	(Schele and Miller 1986: pl. 59a)
ya=a-la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	CPN	Alt. K	M1	Motagua	09.12	(Grube and MacLeod 1989: fig. 1)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	MTL	K793	B5	Central Peten	?	(Kerr 1989: 50)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	MTL	K793	D5	Central Peten	?	(Kerr 1989: 50)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	MTL	K793	F5	Central Peten	?	(Kerr 1989: 50)
ya=la=ja	*y-al-aj-Ø*	4TEMP	1.a.i	PNG	Msc. Peabody	A2	Usumacinta	09.15	(Maler 1901: pl. 11)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	TIK	MT. 176	Q2	Central Peten	09.16	(Culbert 1993: fig. 84)
ya=la=ji=ya	*y-al-aj-Ø=iy*	4TEMP	1.a.ii	TIK	MT. 176	U1	Central Peten	09.16	(Culbert 1993: fig. 84)

at-i – VER.TR.D: "to bathe"

AT-ti=ji=ya	*at-[a]j-Ø=iy*	1PASS	2.c.i	CPN	St. 2	D6b	Motagua	09.11	(Maudslay 1974, I: pl. 102)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	CPN	Papagayo Step	D3	Motagua	09.01	(Schele 1990b: fig. 3a)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	CPN	St. J	W 38	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	CPN	Mon. 39	K1a	Motagua	09.09	(Linda Schele 46030)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	NAR	St. 23	G21	Central Peten	09.14	(Graham and von Euw 1975: 60)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	TIK	St. 24	zA4	Central Peten	09.19	(Jones and Satterthwaite 1982: fig. 38c)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	TIK	St. 40	A11	Central Peten	09.01	(Valdés and Fahsen 1998: fig. 9)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	TLA	St. A	A8	Chiapas	10.00	(Mayer 1991: pl. 225)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 42	pC1	Chiapas	?	(Graham and Mathews 1996: 90)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 56	B5	Chiapas	09.13	(Graham and Mathews 1996: 99)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 63	pF1	Chiapas	09.14	(Graham and Mathews 1996: 101)
ya=AT=ji	*y-at-[i]j-Ø*	4TEMP	2.e.i	TNA	Mon. 110	P1	Chiapas	09.14	(Graham and Mathews 1999: 143)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 134	A9	Chiapas	09.13	(Graham and Mathews 1999: 160)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 136	Q1	Chiapas	09.14	(Graham and Mathews 1999: 163)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 138	B3	Chiapas	09.15	(Graham and Mathews 1999: 167)
ya=ti=ji	*y-at-ij-Ø*	4TEMP	1.c.i	TNA	Mon. 139	N1	Chiapas	09.13	(Graham and Mathews 1999: 169)

bah – NOUN: "head, image"

BAH^{hi}=ja	*bah-[a]j-Ø*	1ABSL	2.c.i	CNC	P. 1	K7	Southern Peten	09.13	(Yuriy Polyukhovych n.p.)
BAH=ja	*bah-[a]j-Ø*	1ABSL	2.e.i	COL	K4331	A1	Yucatan	?	(Kerr 1992: 470)
BAH=ja	*bah-[a]j-Ø*	1ABSL	2.e.i	COL	K4331	E1	Yucatan	?	(Kerr 1992: 470)
BAH^{hi}=ja	*bah-[a]j-Ø*	1ABSL	2.c.i	COL	P. Caracas	C3	Usumacinta	09.16	(Bíró 2005: fig. 9)
1 BAH=ja	*jun bah-[a]j*	1ABSL	2.e.i	CPN	HS. 1 VI	Ap3b	Motagua	09.16	(Barbara Fash n.p.)
BAH^{hi}=ja=la	*bah-[a]j-al-Ø*	1ABSL	2.c.i	CRC	St. 3	D12b	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 3)
TE'-TOK'-BAH=ja	*te' tok' bah-[a]j*	1ABSL	2.e.i	CRN	HS. 2 XI	A1	Central Campeche	09.14	(Sebastian Matteo n.p.)
i ti BAH^{hi}=ja	*i['] ti bah-[a]j*	1ABSL	2.c.i	DPL	HS. 2 III	D1	Pasion	09.12	(Fahsen 2002: fig. 7)
BAH^{hi}=ja	*bah-[a]j-Ø*	1ABSL	2.c.i	TAM	HS. 3 III	E1	Pasion	09.13	(Gronemeyer 2013: pl. 33)
BAH=ja	*bah-[a]j-Ø*	1ABSL	2.e.i	TIK	St. 39	Ap3a	Central Peten	08.17	(Schele and Freidel 1990: fig. 4.14)

BAH hi=ja	*bah-[a]j-Ø*	1ABSL	2.c.i	TIK	T. 4 Lnt. 3	G5	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)

bak – NOUN: "bone, captive"

ti BAK-ke=la	*ti bak-el*	1POSS	1.d.ii	CML	U. 26 Pdt. 15	A6	Tabasco	09.17	(Marc Zender n.p.)
u=BAK=le	*u-bak-[e]l*	1POSS	2.e.i	CML	U. 26 Sp. 6	A4	Tabasco	09.16	(Marc Zender n.p.)
u=WAY BAK=le	*u-way-Ø bak-[e]l*	1POSS	2.e.i	COL	K1256	Q3-Q4	?	?	(Robicsek and Hales 1982: #54)
u=BAK=le	*u-bak-[e]l*	1POSS	2.e.i	COL	Shl. Taylor Limpet	I1a	?	09.18	(Guido Krempel n.p.)
u=BAK=le	*u-bak-[e]l*	1POSS	2.e.i	EKB	Msc. 7	C1	Yucatan	09.16	(Lacadena 2002: fig. 29)
u=BAK=le	*u-bak-[e]l*	1POSS	2.e.i	NAR	St. 23	E19	Central Peten	09.14	(Graham and von Euw 1975: 60)
BAK=le WAY=la	*bak-[e]l way[-w]-[a]l-Ø*	1POSS	2.e.i	PAL	96G	G3	Tabasco	09.17	(Robertson 1991: fig. 265)
BAK=le waWAY=wa=la	*bak-[e]l way-w-al*	1POSS	2.e.i	PAL	96G	I2	Tabasco	09.17	(Robertson 1991: fig. 265)
BAK WAYya=wa	*bak[-el] way-w-a[l]-Ø*	1POSS	2.g.ii	PAL	DH	F1	Tabasco	09.12	(Robertson 1991: fig. 286)
BAK=le waWAY	*bak-[e]l way[-w-al]-Ø*	1POSS	2.e.i	PAL	PNFS	F1	Tabasco	09.16	(Schele and Mathews 1979: no. 37)
BAK=la WAY=wa=la	*bak-[e]l way-w-al*	1POSS	2.e.ii	PAL	T14T	D10	Tabasco	09.13	(Robertson 1991: fig. 176)
BAK WAY	*bak[-el] way[-w-al]-Ø*	1POSS	2.g.ii	PAL	TC	K3	Tabasco	09.12	(Robertson 1991: fig. 9)
BAK WAY	*bak[-el] way[-w-al]-Ø*	1POSS	2.g.ii	PAL	TC	O14	Tabasco	09.12	(Robertson 1991: fig. 9)
BAK WAY=wa=la	*bak[-el] way-w-al]-Ø*	1POSS	2.g.ii	PAL	TC	O1b	Tabasco	09.12	(Robertson 1991: fig. 9)
BAK=le WAY=wa	*bak-[e]l way-w-a[l]*	1POSS	2.e.i	PAL	TCJ	E3	Tabasco	09.12	(Robertson 1991: fig. 33)
BAK WAY=wa	*bak[-el] way-w-a[l]-Ø*	1POSS	2.g.ii	PAL	TFC	F4b	Tabasco	09.12	(Robertson 1991: fig. 153)
BAK WAY=wa=la	*bak[-el] way-w-al]-Ø*	1POSS	2.g.ii	PAL	TFC	O3	Tabasco	09.12	(Robertson 1991: fig. 153)
BAK=le WAY=la	*bak-[e]l way[-w]-[a]l-Ø*	1POSS	2.e.i	PAL	TFLD	A3	Tabasco	09.13	(Schele and Mathews 1979: no. 301)
BAK WAY=wa	*bak[-el] way-w-a[l]-Ø*	1POSS	2.g.ii	PAL	TS	K1	Tabasco	09.12	(Robertson 1991: fig. 95)
BAK=le WAY=la	*bak-[e]l way[-w]-[a]l-Ø*	1POSS	2.e.i	PAL	TS	N11-O11	Tabasco	09.12	(Robertson 1991: fig. 95)
BAK=le waWAY=wa	*bak-[e]l way-w-a[l]*	1POSS	2.e.i	PAL	TS	Q9	Tabasco	09.12	(Robertson 1991: fig. 95)
BAK=le WAY=la	*bak-[e]l way[-w]-[a]l-Ø*	1POSS	2.e.i	PAL	TSJ	E1	Tabasco	09.13	(Schele and Mathews 1979: no. 331)
IX BAK=e-le	*ix bak-el*	1POSS	1.e.i	XLM	Jmb. 8	Ap2-Ap3	Yucatan	09.15	(Graham and von Euw 1992: 170)
IX BAK=e-le	*ix bak-el*	1POSS	1.e.i	XLM	Jmb. 9	Ap1-Ap2	Yucatan	09.15	(Graham and von Euw 1992: 171)
u=ba-ke=le	*u-bak-el-Ø*	1POSS	1.d.i	YAX	Bur. 2 85	A1-A2	Usumacinta	09.15	n/a

bak-V – VER.TR.D: "to capture"

BAK=na=ja	*bak-n-aj-Ø*	1PASS	1.f.ii	TIK	T. 1 Lnt. 3	A6	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)
BAK=wa=ja	*bak-w-aj-Ø*	1PASS	1.f.ii	TIK	T. 4 Lnt. 2	B10	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 73)
BAK=wa=ja	*bak-w-aj-Ø*	1PASS	1.f.ii	TIK	T. 4 Lnt. 3	B5	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)

bak – POS: "joint"

8 ko BAK=li=bi	*waxak ko[k] bak-l-ib*	3INSTR	1.f.ii	TRT	Mon. 6	K10	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)

bak – VER.TR.R: "to spill"

ba-ka=bi	*bak-ab-i-Ø*	n/a	n/a	C Dr.	74	B3	Yucatan	11.04	(Anders and Deckert 1975: 7)

bih – NOUN: "road"

TAN^{na} bi-hi=li CHAM^{mi}	*ta[h]n bih-il cham*	1ATTR	1.a.i	MTL	K791	I'1-J'1	Central Peten	09.16	(Kerr 1989: 49)

bot'– VER.TR.R: "to (s)mash, to buckle"

bo-t'a?=ja	*bo<h>t'-aj-Ø*	1PASS	1.b.i	COL	Jmb. Amparo	Bp3	Yucatan	09.15	(Mayer 1995: pl. 237)
bo-t'a?=ja	*bo<h>t'-aj-Ø*	1PASS	1.b.i	XLM	Lnt. 1	C1	Yucatan	09.15	(Graham and von Euw 1992: 158)

bub – NOUN: "conch / tadpole / water beetle"

AJ bu=lu HA'	*aj bu[b]-[u]l ha'*	1ATTR	2.g.i	OAG	Alt. 1	H1	Usumacinta	09.10	(Mayer 1995: pl. 92)
AJ ^{2}bu=lu HA'	*aj bub-ul ha'*	1ATTR	1.a.i	PNG	P. 2	J'2	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)

but' – VER.TR.R: "to fill"

bu-t'u=ja	*bu<h>t'-[a]j-Ø*	1PASS	2.a.i	COL	K1650	D1	Central Peten	?	(Robicsek and Hales 1982: #3)
ha-i u=bu-tu=wa	*ha[']i[']-Ø u-but'-u-Ø*	2IND	1.a.ii	PAL	PT	M11-N11	Tabasco	09.14	(Robertson 1985b: fig. 258)
u=bu-t'u	*u-but'-u-Ø*	2IND	1.g.i	QRG	St. E	C20a	Motagua	09.17	(Looper 2003: fig. 4.38)

butz' – NOUN: "smoke"

bu-tz'a=ja	*butz'-aj-Ø*	1INCH	1.d.i	PAL	TC	R5	Tabasco	09.12	(Robertson 1991: fig. 9)

chak – ADJ: "red, great"

CHAK=ja=la TE'	*chak-j-al te'-Ø*	1INCH	2.f.ii	DCB	St. 1	J2b	Usumacinta	09.14	(Cougnaud et al. 2003: fig. 4)
CHAK=ja=la TE'	*chak-j-al te'-Ø*	1INCH	2.f.ii	DCB	St. 1	M2b	Usumacinta	09.14	(Cougnaud et al. 2003: fig. 4)
CHAK=ja=la TE'	*chak-j-al te'-Ø*	1INCH	2.f.ii	YAX	Lnt. 45	D5	Usumacinta	09.12	(Graham 1979: 100)
CHAK=ja=la TE'	*chak-j-al te'-Ø*	1INCH	2.f.ii	YAX	St. 3	C6b	Usumacinta	09.16	(Tate 1992: fig. 85)
CHAK=ja=la TE'	*chak-j-al te'-Ø*	1INCH	2.f.ii	YAX	St. 6	C8a	Usumacinta	09.16	(Tate 1992: fig. 88)

chak – VER.TR.R: "to tie"

CHAK=ja	*cha<h>k-[a]j-Ø*	1PASS	2.e.i	COL	K6751	N6a	Central Peten	?	(Martin 1997: fig. 1a)
CHAK-ka=ja=li=bi	*chak-aj-l-ib*	3INSTR	1.f.ii	CNC	P. 1	E7	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
CHAK=li=bi	*chak-l-ib*	3INSTR	1.f.ii	TNA	Mon. 27	B2	Chiapas	09.14	(Graham and Mathews 1996: 71)

cham – VER.INTR: "to die"

^{cha}CHAM=ya=li	*cham-y-al-Ø*	2COM	4.a.i	CPN	St. A	C7b	Motagua	09.14	(Alexander 1988: fig. 1)

chan – NOUN: "sky"

CHAN^{na}=NAL K'UH	*chan-al k'uh*	1ATTR	1.e.iv	COL	God D Vessel	M8	?	?	(Boot 2008: fig. 4)
CHAN-na=la K'UH	*chan-al k'uh*	1ATTR	1.a.i	COL	Yax Wayib	A6-B6	Central Peten	09.00	(Houston and Inomata 2009: fig. 2.3)
CHAN-NAL K'UH	*chan-al k'uh*	1ATTR	1.e.iv	CPN	St. 2	D8a	Motagua	09.11	(Maudslay 1974, I: pl. 102)
CHAN=NAL	*chan-al*	1ATTR	1.e.iv	CPN	St. 10	E4b	Motagua	09.10	(Schele 1987c: fig. 4)
CHAN-na=la K'UH	*chan-al k'uh*	1ATTR	1.a.i	CPN	St. 12	D1	Motagua	09.12	(Boot 2009b: 46)
CHAN=NAL^{la}	*chan-al*	1ATTR	1.e.iv	CPN	St. 13	D10a	Motagua	09.10	(Linda Schele SD 1040)
CHAN^{na}=NAL K'UH	*chan-al k'uh*	1ATTR	1.e.iv	CPN	St. B	A10	Motagua	09.15	(Barbara Fash n.p.)
CHAN^{na}=NAL^{la}	*chan-al*	1ATTR	1.e.iv	NAR	K2796	P3	Central Peten	?	(Coe 1973: #49)
CHAN^{na}=NAL^{la}	*chan-al*	1ATTR	1.e.iv	NAR	K7750	Z3	Central Peten	09.17	(Grube 1998b)
CHAN^{na}=NAL i-ka-tzi	*chan-al ikatz*	1ATTR	1.e.iv	PAL	TI-M	B6-A7	Tabasco	09.12	(Robertson 1983b: fig. 96)
CHAN-na K'UH	*chan-a[l] k'uh*	1ATTR	1.g.i	PAL	TI-W	J10	Tabasco	09.12	(Robertson 1983b: fig. 97)
SQUARE.NOSE CHAN=la	*SQUARE.NOSE chan-[a]l*	1ATTR	2.e.i	QRG	Alt. P'	S1a	Motagua	09.18	(Jones 1983)
CHAN K'UH	*chan[-al] k'uh*	1ATTR	2.g.ii	QRG	Mon. 26	Dp1	Motagua	09.02	(Looper 2003: fig. 1.7)
CHAN K'UH	*chan[-al] k'uh*	1ATTR	2.g.ii	TIK	St. 31	A14	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
CHAN K'UH	*chan[-al] k'uh*	1ATTR	2.g.ii	TIK	St. 31	F25	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
CHAN-na=ja	*chan-aj-Ø*	1INCH	1.a.i	C Dr.	68a	C1	Yucatan	11.04	(Anders and Deckert 1975: 68)
CHAN-na=ja	*chan-aj-Ø*	1INCH	1.a.i	COL	K1991	B3	?	?	(Kerr 1990: 199)

chek – VER.TR.R.: "to clear / to appear"

che-ka=ja	*che<h>k-aj-Ø*	1PASS	1.c.i	CRC	Alt. 21	D'1b	Mopan-Pusilha	09.10	(Houston 1991)
che-ka=ja	*che<h>k-aj-Ø*	1PASS	1.c.i	CRC	St. 6	C23	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 7)
che-ka=ja	*che<h>k-aj-Ø*	1PASS	1.c.i	CRC	St. 6	D24	Mopan-Pusilha	09.08	(Chase and Chase 1987: fig. 70)
che-ka=ja	*che<h>k-aj-Ø*	1PASS	1.c.i	CRN	HS. 2 XVII	D3	Central Peten	09.12	(David Stuart n.p.)
che-ka=ja	*che<h>k-aj-Ø*	1PASS	1.c.i	CRN	HS. 2 XXX	D3	Central Peten	09.12	(David Stuart n.p.)

chih – NOUN: "pulque"

^{chi}CHIH-hi=li AKAN^{na}	*chih-il akan*	1ATTR	1.a.i	TRT	Mon. 6	E1-F1	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
YAX chi-hi=li ? HA'	*yax chih-il ? ha'*	1ATTR	1.a.i	NAR	St. 29	F14-G14	Central Peten	09.14	(Graham 1978: 78)

chij – NOUN: "deer"

^{chi}CHIJ=la	*chij-[i]l*	1ATTR	2.e.ii	COL	K531	I1	?	?	(Robicsek and Hales 1982: #33)
^{chi}CHIJ=la	*chij-[i]l*	1ATTR	2.e.ii	COL	K556	A1	?	?	(Robicsek and Hales 1982: #34)
chi-hi=li	*chi[j]-il*	1ATTR	1.a.i	COL	K1901	R1	?	?	(Kerr 1989: 126)
chi-ji=la	*chij-il*	1ATTR	1.a.i	COL	K2572	E2	?	?	(Kerr 1990: 244)
ta SAK chi-hi=li WE'	*ta sak chi[j]-il we'*	1ATTR	1.a.i	COL	K5460	P1-R1	Central Peten	?	(Reents-Budet 1994: 281)
ta SAK^{ki} chi-ji=li WAJ^{ji}	*ta sak chij-il waj*	1ATTR	1.a.i	COL	K6080	K1-O1	Central Peten	?	(Kerr and Kerr 2000)
chi-hi=li CHAN^{na}	*chi[j]-il chan*	1ATTR	1.a.i	NAR	K927	N1-N2	Central Peten	09.13	(Coe 1982: #60)

chik – VER.TR.R: “to tremble”

u=chi-ka=ba	*u-chik-ab-Ø*	3INSTR	1.b.i	COL	Rattle	A1-B1		09.15	(Grube and Gaida 2006: #38)

chit – NOUN: “companion”

u=CHIT=ja	*u-chit-[a]j-Ø-Ø*	1INCH	2.e.i	CPN	T. 11 WDSP	B5	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 13)

choch – VER.TR.R

cho-cha=ja	*cho<h>ch-aj-Ø*	1PASS	1.b.i	NMP	St. 15	M1	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)

chok – VER.TR.R: “to scatter”

cho-ko=pa ch'a-ji	*chok-p-a[j]-Ø ch'aj*	1MED	1.f.i	QRG	Zoo. G	N'4	Motagua	09.17	(Looper 2001: fig. 4)
cho-ka=ja	*cho<h>k-aj-Ø*	1PASS	1.b.i	QRG	St. F	C9a	Motagua	09.16	(Looper 2003: fig. 4.5)
CHOK-ka=ja	*cho<h>k-aj-Ø*	1PASS	1.b.i	UAX	St. 12	A4	Central Peten	10.03	(Graham 1986: 161)
CHOK=wa ch'a	*chok-[o]w-Ø ch'a[j]*	2ANTIP	2.e.ii	ARP	St. 2	C3	Pasion	09.15	(Houston and Mathews 1985: fig. 11)
CHOK=wa ch'a-ji	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	CLK	Msc. 62	B2	Central Campeche	09.16	(Ian Graham n.p.)
i CHOK-ko=wi	*i['] chok-ow-Ø*	2ANTIP	1.a.ii	CLK	St. 33	F4	Central Campeche	09.11	(Simon Martin n.p.)
CHOK=wa ch'a-ji	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	CLK	St. 61	B2	Central Campeche	10.04	(Ian Graham n.p.)
CHOK=wa ch'a-ji	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	CLK	St. 62	Bp4	Central Campeche	09.16	(Ian Graham n.p.)
CHOK-ko=wa ch'a-ji	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	QRG	Alt. P'	I1	Motagua	09.18	(Jones 1983)
CHOK=wa ch'a-jiy	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	QRG	St. E	B17b	Motagua	09.17	(Looper 2003: fig. 4.41)
CHOK=wi	*chok-[o]w-Ø*	2ANTIP	2.e.ii	RAZ	Jd. Celt 2	B6b	Central Peten	09.00	(Grube and Martin 2001: 49)
CHOK=wa ch'a-ji	*chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	TIK	St. 19	B13	Central Peten	09.17	(Jones and Satterthwaite 1982: fig. 27)
i CHOK=wa ch'a-ji	*i['] chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	TIK	St. 21	B11	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 31a)
i CHOK=wa ch'a-ji	*i['] chok-[o]w-Ø ch'aj*	2ANTIP	2.e.ii	TIK	St. 22	B12	Central Peten	09.17	(Jones and Satterthwaite 1982: fig. 33)
CHOK=wi ch'a	*chok-[o]w-Ø ch'a[j]*	2ANTIP	2.e.ii	UXL	St. 12	B5	Central Campeche	09.11	(Grube 2008: fig. 8.59)
CHOK=wa ja	*chok-[o]w-Ø [ch'a]j*	2ANTIP	2.e.ii	UXL	St. 13	B4	Central Campeche	09.11	(Grube 2008: fig. 8.60)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	AGT	St. 1	A2	Pasion	09.15	(Graham 1967: fig. 3)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	CHN	T1L-L1	C2	Yucatan	10.04	(Graña-Behrens 2002: pl. 31)
u=CHOK-ko=wa ch'a-ji	*u-chok-o-Ø ch'aj*	2IND	1.a.ii	CLK	St. 33	H2	Central Campeche	09.11	(Simon Martin n.p.)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	COB	St. 1	X22	Quintana Roo	09.12	(Graham and von Euw 1997: 20)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	CPN	St. 13	D8	Motagua	09.11	(Linda Schele SD 1040)
u=CHOK-ko ch'a-ji	*u-chok-o-Ø ch'aj*	2IND	1.g.i	CPN	T. 22 Stone	E4	Motagua	09.18	(Schele et al. 1989: fig. 29)
u=CHOK=wa ch'a-ha	*u-chok[-o]-Ø ch'ah*	2IND	2.e.ii	CRC	Alt. 12	H2-G3	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	CRC	St. 3	D15b	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	DPL	HBh. 1	D1	Pasion	09.15	(Houston 1993: fig. 4.9)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	DPL	St. 1	pA4	Pasion	09.15	(Ian Graham n.p.)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	DPL	St. 11	A4	Pasion	09.14	(Houston 1993: fig. 3.27)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	DPL	St. 15	A7	Pasion	09.14	(Houston 1993: fig. 3.25)
u=cho-ko=wa ch'a-ji	*u-chok-o-Ø ch'aj*	2IND	1.a.ii	DPL	St. 8	I5	Pasion	09.14	(Houston 1993: fig. 4.14)

u=CHOK=wa ch'a-ja	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	ITN	St. 6	G3	Pasion	09.19	(Ian Graham n.p.)
u=CHOK-ko=wa ch'a-ji	*u-chok-o-Ø ch'aj*	2IND	1.a.ii	IXL	Alt. 1	A4	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 81c)
u=CHOK-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	IXL	St. 1	A3	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 81c)
u=CHOK-ko=wa ch'a-ji	*u-chok-o-Ø ch'aj*	2IND	1.a.ii	IXZ	St. 4	B2	Mopan-Pusilha	09.17	(Graham 1980: 181)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	JMB	St. 1	A2	Central Peten	10.02	(Jones and Satterthwaite 1982: fig. 78)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	LBT	BcM. 2	E1	Mopan-Pusilha	09.17	(Wanyerka 2003: fig. 4)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	MRL	St. 1	F1	Tabasco	09.16	(William Andrews n.p.)
u=CHOK=wi	*u-chok[-o]-Ø*	2IND	2.e.ii	NAR	Alt. 1	K9	Central Peten	09.08	(Graham 1978: 104)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	NKM	St. C	Ap3	Central Peten	09.19	(Grube and Martin 2004: 81)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	NMP	St. 21	C2	Mopan-Pusilha	09.18	(Stuart and Grube 2000: fig. 2)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	OXP	St. 12	C1	Central Campeche	09.15	(Grube 2008: fig. 8.37)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	OXP	St. 2	C3	Central Campeche	09.17	(Grube 2008: fig. 8.23)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	PAL	PT	E19	Tabasco	09.14	(Robertson 1985b: fig. 258)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	PMT	Mon. 4	pA3	Tabasco	09.13	(Ian Graham n.p.)
u=CHOK=wa ch'a-ha	*u-chok[-o]-Ø ch'ah*	2IND	2.e.ii	PMT	P. 1	pH5	Tabasco	09.17	(Schele and Miller 1986: fig. III.2)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	PRU	St. 39	Ap8	Central Peten	09.15	(Guenter 2004: fig. 14)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	PSD	Lnt. 2	A3	Usumacinta	09.16	(Tate 1992: fig. 38)
u=cho-CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	QRG	Alt. O'	R2	Motagua	09.18	(Jones 1983)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	QRG	St. C	C13	Motagua	09.17	(Looper 2003: fig. 5.14)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	QRG	St. D	B18b	Motagua	09.17	(Looper 2003: fig. 4.26)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	QRG	St. D	C23a	Motagua	09.17	(Looper 2003: fig. 4.28)
u=CHOK=wa ch'a	*u-chok[-o]-Ø ch'a[j]*	2IND	2.e.ii	QRG	St. E	D19a	Motagua	09.17	(Looper 2003: fig. 4.38)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	QRG	St. K	D6b	Motagua	09.18	(Looper 2001: fig. 10)
u=CHOK-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	QRG	Str. 1B-1	P1	Motagua	09.19	(Schele and Looper 1996: 186)
u=CHOK-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	QRG	Str. 1B-1	V1a	Motagua	09.19	(Schele and Looper 1996: 186)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	QRG	Zoo. P	C4b	Motagua	09.18	(Looper 2001: fig. 22)
u=cho-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	REI	HS. 1 C	pC1	Western Peten	09.13	(Stuart 2012a: fig. 7)
u=CHOK-ko=wa	*u-chok-o-Ø*	2IND	1.a.ii	SBL	St. 10	B3	Pasion	10.01	(Graham 1996: 32)
u=CHOK=wa ch'a-ji	*u-chok[-o]-Ø ch'aj*	2IND	2.e.ii	SBL	Str. A-14 T3	R1a	Pasion	09.16	(Graham 1990: fig. 1)
u=CHOK=wa ch'a	*u-chok[-o]-Ø ch'a[j]*	2IND	2.e.ii	SBL	Str. A-14 T5	Y1	Pasion	09.16	(Graham 1990: fig. 1)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	TNA	Mon. 110	K1	Chiapas	09.14	(Graham and Mathews 1999: 143)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	TNA	Mon. 111	S1b	Chiapas	09.13	(Graham and Mathews 1999: 145)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	TNA	Mon. 113	M1	Chiapas	09.12	(Graham and Mathews 1999: 147)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	TNA	Mon. 137	P1	Chiapas	09.15	(Graham and Mathews 1999: 165)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	TNA	Mon. 138	B4	Chiapas	09.15	(Graham and Mathews 1999: 167)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	TNA	Mon. 158	M1	Chiapas	10.03	(Ian Graham n.p.)
u=CHOK=wa ch'a-ji	*u-chok-[o]-Ø ch'aj*	2IND	2.e.ii	TNA	Mon. 162	A4	Chiapas	09.15	(Graham and Henderson 2006: 103)
u=CHOK ji	*u-chok-Ø-Ø [ch'a]j*	2IND	2.g.ii	TNA	Mon. 164	Q1	Chiapas	09.14	(Graham and Henderson 2006: 105)
u=CHOK ji	*u-chok-Ø-Ø [ch'a]j*	2IND	2.g.ii	TNA	Mon. 174	F1	Chiapas	09.14	(Graham and Henderson 2006: 119)
u=CHOK ji	*u-chok-Ø-Ø [ch'a]j*	2IND	2.g.ii	TNA	Mon. 7	H1	Chiapas	09.14	(Mathews 1983: 25)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	TNA	Mon. 8	D2	Chiapas	09.12	(Mathews 1983: 30)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	UCN	St. 4	B2	Mopan-Pusilha	10.01	(Graham 1980: 159)
u=CHOK=wa	*u-chok[-o]-Ø*	2IND	2.e.ii	YXH	St. 13	A3	Central Peten	09.18	(Grube and Martin 2004: 71)

u=BAH ti CHOK-ko=la	*u-bah-Ø ti chok-ol*	3NMLS	1.a.ii	CRN	Msc. 2	A3	Central Peten	09.13	(Mayer 1989: pl. 110)
ti cho-ko=la	*ti chok-ol*	3NMLS	1.a.ii	PNG	Msc. Peabody	A4	Usumacinta	09.15	(Maler 1901: pl. 11)
u=CHOK-ko=ji	*u-chok-oj-Ø*	4TEMP	1.a.ii	COL	Alt. Puerto Barrios	H3	Motagua	09.15	(Sven Gronemeyer DSC03370)
u=CHOK=ji	*u-chok-[o]j-Ø*	4TEMP	2.e.ii	CPN	St. B	B7	Motagua	09.15	(Maudslay 1974, I: pl. 37)
u=CHOK=ji	*u-chok-[o]j-Ø*	4TEMP	2.e.ii	QRG	Mon. 26	Cp1	Motagua	09.02	(Looper 2003: fig. 1.7)
u=CHOK=ji	*u-chok-[o]j-Ø*	4TEMP	2.e.ii	TNA	Mon. 104	G1	Chiapas	10.00	(Graham and Mathews 1996: 127)

chuk – VER.TR.R: "to capture"

chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	BPK	R. 2-15	A2	Usumacinta	09.17	(Miller and Houston 1998: fig. 4)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	BPK	Lnt. 1	A3	Usumacinta	09.17	(Mathews 1980: fig. 5)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	BPK	Lnt. 2	A3	Usumacinta	09.17	(Mathews 1980: fig. 6)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	BPK	Lnt. 3	A3	Usumacinta	09.15	(Mathews 1980: fig. 7)
chu-ku=ja	*chu<h>k-[a]j-Ø*	1PASS	2.a.i	BPK	ScS. 4	D6a	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	3a	F3	Yucatan	11.04	(Anders and Deckert 1975: 3)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	37a	A1	Yucatan	11.04	(Anders and Deckert 1975: 37)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	C Ma.	40b	A2	Yucatan	11.11	(Anders 1967: 40)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	C Ma.	40b	C1	Yucatan	11.11	(Anders 1967: 40)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	C Ma.	41a	A1	Yucatan	11.11	(Anders 1967: 41)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	C Ma.	41b	A2	Yucatan	11.11	(Anders 1967: 41)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	C Ma.	41c	E1	Yucatan	11.11	(Anders 1967: 41)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	C Ma.	41b	E2	Yucatan	11.11	(Anders 1967: 41)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	C Ma.	41b	G2	Yucatan	11.11	(Anders 1967: 41)
chu	*chu<h>[k-aj]-Ø*	1PASS	4.a.iii	C Ma.	54c	C1	Yucatan	11.11	(Anders 1967: 54)
3 chu-ka=ja	*ux chu<h>k-aj-Ø*	1PASS	1.b.i	C Pa.	9b	D2	Yucatan	10.18	(Anders 1968: 9)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	CLK	St. 9	pO3	Central Campeche	09.10	(Ian Graham n.p.)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	CML	U. 26 Sp. 5	A3	Tabasco	09.16	(Marc Zender n.p.)
chu-ka	*chu<h>k-a-Ø*	1PASS	1.g.i	CNH	P. 1	A3	Southern Peten	10.02	(Dillon 1978: fig. 1)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	CNK	Trn. 1	K1	Tabasco	09.16	(Maler 1901: pl. 2)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	COL	St. Canberra	A2	Usumacinta	09.17	(Mayer 1989: pl. 101)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	COL	P. Brussels	A4a	Usumacinta	09.13	(Bíró 2005: fig. 4)
chu-ka=ji	*chu<h>k-aj-Ø*	1PASS	1.b.ii	COL	K503	A5	?	09.16	(Kerr 1989: 24)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	COL	K1606	D1	?	09.13	(Kerr 1989: 101)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	COL	Frg. Robey	pF1	Chiapas	09.13	(Peter Mathews n.p.)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	COL	K2352	S2-S3	Southern Peten	?	(Kerr 1990: 240)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	COL	K2206	V1-W1	Southern Peten	?	(Kerr 1990: 219)
chu	*chu<h>[k-aj]-Ø*	1PASS	4.a.iii	COL	K2352	W2	Southern Peten	?	(Kerr 1990: 240)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	CRC	Alt. 23	D1	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 4)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	CRN	HS. 2 1-X	B2	Central Peten	09.12	(David Stuart n.p.)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	DPL	HS. 2 E I	D1	Pasion	09.12	(Fahsen 2002: fig. 7)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	DPL	HS. 3 II	B2	Pasion	09.15	(Houston 1993: fig. 4.23)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	DPL	HS. 3 II	C2	Pasion	09.15	(Christian Prager n.p.)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	DPL	HS. 3 I	D2	Pasion	09.15	(Houston 1993: fig. 4.23)

chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	EXC	P. 2	B6	Pasion	09.16	(Stephen Houston n.p.)
chu-ku=ja	*chu<h>k-[a]j-Ø*	1PASS	2.a.i	LTI	P. 1	A2	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
chu-ku-ka=ya	*chu<h>k[-j]-Ø=[i]y*	1PASS	4.a.i	MAR	St. 3	B11	Usumacinta	09.18	(Schele and Grube 1994b: fig. 3)
chu-ku=ja	*chu<h>k-[a]j-Ø*	1PASS	2.a.i	MAR	St. 3	C1	Usumacinta	09.18	(Schele and Grube 1994b: fig. 3)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	MRL	St. 1	L3	Tabasco	09.16	(William Andrews n.p.)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	NAR	St. 22	H2	Central Peten	09.13	(Graham and von Euw 1975: 56)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	PAL	SWC	147	Tabasco	?	(Schele and Mathews 1979: no. 147)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PAL	HCHS	C7a	Tabasco	09.11	(Robertson 1985b: fig. 319)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PAL	T17T	E2	Tabasco	09.12	(González and Fernández Martínez 1994)
chu-ku-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.e.iii	PAL	SLAV	E2a	Tabasco	09.14	(Robertson 1991: fig. 229)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	PNG	St. 12	Ap17a	Usumacinta	09.18	(Stuart and Graham 2003: 62)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PNG	P. 15	C12	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PNG	P. 15	G1	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PNG	P. 15	P11	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	PSD	Lnt. 1	A3	Usumacinta	09.16	(Klausmeyer n.p.)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	QRG	Alt. O'	F2b	Motagua	09.18	(Jones 1983)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TNA	Msc. 5	A2	Chiapas	?	(Graham and Mathews 1999: 180)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TNA	Mon. 8	E1	Chiapas	09.12	(Mathews 1983: 28)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Frg. 43	pB1	Chiapas	09.12	(Peter Mathews n.p.)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Mon. 84	D1	Chiapas	09.13	(Graham and Mathews 1996: 114)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TNA	Mon. 141	A3a	Chiapas	09.13	(Graham and Mathews 1999: 173)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Mon. 145	H1	Chiapas	09.13	(Graham and Henderson 2006: 76)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TNA	Mon. 147	C1	Chiapas	09.13	(Graham and Henderson 2006: 80)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Mon. 157	F1	Chiapas	09.12	(Graham and Henderson 2006: 91)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Mon. 159	G4	Chiapas	09.18	(Graham and Henderson 2006: 94)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	TNA	Mon. 172	B2	Chiapas	09.13	(Graham and Henderson 2006: 117)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TNL	Alt. 1	A2	Central Campeche	?	(Prem and Grube 1988: fig. 2)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TRT	Mon. 8	B39	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TRT	Mon. 8	B52a	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TRT	Mon. 8	B60	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TZB	Mon. 13	A2	Quintana Roo	09.07	(Nalda 2004: 46)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TZB	Mon. 17	B1	Quintana Roo	09.07	(Nalda 2004: 50)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	TZB	Mon. 22	A2	Quintana Roo	09.07	(Nalda 2004: 55)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 3 II	A2	Usumacinta	09.15	(Graham 1982: 168)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 3 VI	A2	Usumacinta	09.15	(Graham 1982: 173)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	YAX	HS. 3 I	A2	Usumacinta	09.15	(Graham 1982: 166)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 3 I	C6	Usumacinta	09.15	(Graham 1982: 166)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 3 III	C3a	Usumacinta	09.15	(Graham 1982: 169)
chu-ku=ji=ya	*chu<h>k-j-Ø=iy*	1PASS	2.f.ii	YAX	HS. 3 III	C9b	Usumacinta	09.15	(Graham 1982: 169)
chu-ku-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.e.iii	YAX	HS. 3 I	D1	Usumacinta	09.15	(Graham 1982: 166)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 4 III	D3	Usumacinta	09.16	(Graham 1982: 176)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 I	105	Usumacinta	09.18	(Graham 1982: 179)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 I	115	Usumacinta	09.18	(Graham 1982: 179)

chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 II	137	Usumacinta	09.18	(Graham 1982: 181)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 II	148	Usumacinta	09.18	(Graham 1982: 181)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 II	160	Usumacinta	09.18	(Graham 1982: 181)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 II	170a	Usumacinta	09.18	(Graham 1982: 181)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	HS. 5 I	58	Usumacinta	09.18	(Graham 1982: 179)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 8	A3	Usumacinta	09.16	(Graham and von Euw 1977: 27)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 10	B7	Usumacinta	09.18	(Graham and von Euw 1977: 31)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 10	F6a	Usumacinta	09.18	(Graham and von Euw 1977: 31)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 12	B3	Usumacinta	09.16	(Graham and von Euw 1977: 33)
chu-ka	*chu<h>k-a[j]-Ø*	1PASS	1.g.i	YAX	Lnt. 16	A2a	Usumacinta	09.16	(Graham and von Euw 1977: 41)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 41	C1	Usumacinta	09.16	(Graham 1979: 91)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 44	A3	Usumacinta	09.12	(Graham 1979: 97)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 45	A2a	Usumacinta	09.12	(Graham 1979: 99)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	Lnt. 46	F3	Usumacinta	09.11	(Graham 1979: 101)
chu=ja	*chu<h>[k]-[a]j-Ø*	1PASS	2.g.i	YAX	St. 18	A4	Usumacinta	09.15	(Tate 1992: fig. 145)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YAX	St. 19	A3	Usumacinta	09.13	(Tate 1992: fig. 146)
chu-ka=ja	*chu<h>k-aj-Ø*	1PASS	1.b.i	YXH	St. 31	A2	Central Peten	09.18	(Grube 2000c: fig. 206)
u=chu-ku=wa	*u-chuk-u-Ø*	2IND	1.a.ii	COL	K1991	C1	?	?	(Kerr 1990: 199)
u=chu-ku=wa	*u-chuk-u-Ø*	2IND	1.a.ii	PAL	HDPG	A4	Tabasco	09.13	(Robertson 1983b: fig. 239)
u=chu-ku=wa	*u-chuk-u-Ø*	2IND	1.a.ii	TAM	HS. 1 III	A2	Pasion	09.16	(Gronemeyer 2013: pl. 28)
u=chu-ku=ya	*u-chuk[-j]-Ø=[i]y*	4TEMP	2.g.ii	PNG	Trn. 1	A'1	Usumacinta	09.17	(Teufel 2004: 549)
u=chu-ku=ya	*u-chuk[-j]-Ø=[i]y*	4TEMP	2.g.ii	YAX	Lnt. 46	F9	Usumacinta	09.11	(Graham 1979: 101)

chul – VER.TR

chu-li=wi HIX	*chul-[u]w-Ø hix*	2ANTIP	2.c.i	DPL	HS. 3 II	D2	Pasion	09.15	(Christian Prager n.p.)

chum – POS: “sit”

i CHUM=ja	*i['] chu<h>m-[a]j-Ø*	1POS	2.e.i	TIK	Hombre	C8	Central Peten	08.18	(Fahsen 1988: fig. 4)
CHUM^{mu}=ja	*chu<h>m-[a]j-Ø*	1POS	2.a.i	TNA	Hbh. Acropolis 3	A1	Chiapas	09.16	(Martin and Grube 2000: 188)
CHUM^{mu}=ji=ya	*chu<h>m-j-Ø=iy*	1POS	2.f.ii	TNA	Mon. 28	Dp5	Chiapas	09.11	(Graham and Mathews 1996: 73)
CHUM^{mu}=ja	*chu<h>m-[a]j-Ø*	1POS	2.a.i	TNA	Mon. 106	pC1	Chiapas	09.08	(Graham and Mathews 1999: 135)
CHUM^{mu}=ja=ji=ya ta AJAW	*i['] chu<h>m-j-Ø=ij=iy*	1POS	2.f.ii	TNA	Mon. 111	O1	Chiapas	09.13	(Graham and Mathews 1999: 145)
CHUM^{mu}=ji=ya ta AJAW=le	*chu<h>m-j-Ø=iy ta ajaw-le[l*	1POS	2.f.ii	TNA	Mon. 134	B5	Chiapas	09.13	(Graham and Mathews 1999: 160)
CHUM=ja	*chu<h>m-[a]j-Ø*	1POS	2.e.i	TNA	Mon. 135	J1	Chiapas	09.15	(Graham and Mathews 1999: 161)
CHUM^{mu}=ji=ya AJAW	*chu<h>m-j-Ø=iy ajaw*	1POS	2.f.ii	TNA	Mon. 168	A6	Chiapas	09.07	(Graham and Henderson 2006: 113)
CHUM=ji=ya ta AJAW=le	*chu<h>m-j-Ø=iy ta ajaw-le[l*	1POS	2.f.ii	TNA	Mon. 169	C4	Chiapas	09.14	(Graham and Henderson 2006: 114)
CHUM^{mu}=ja=ya	*chu<h>m-j-Ø=[i]y*	1POS	2.f.ii	TNA	Mon. 170	F1	Chiapas	09.16	(Graham and Henderson 2006: 115)
CHUM^{mu}=ji=ya	*chu<h>m-j-Ø=iy*	1POS	2.f.ii	TNA	Mon. 173	C3	Chiapas	09.09	(Graham and Henderson 2006: 118)
CHUM^{mu}=ji	*chu<h>m-[a]j-Ø*	1POS	2.a.i	UXL	St. 6	A3a	Central Campeche	09.12	(Grube 2008: fig. 8.51)
u=CHUM^{mu}=bi	*u-chum-ib*	3INSTR	2.a.i	CPN	Str. 10K Hbh.	A5	Motagua	09.17	(Linda Schele 66041)

chuy – VER.TR.R: "to weave"

u=chu-yu	*u-chuy-u-Ø*	2IND	1.g.i	C Dr.	2b	A1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=chu-yu	*u-chuy-u-Ø*	2IND	1.g.i	C Dr.	2b	C1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=chu-yu	*u-chuy-u-Ø*	2IND	1.g.i	C Dr.	2c	A1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=chu=wa	*u-chu[y-u]-Ø*	2IND	2.g.i	C Dr.	2c	C1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=chu-yu	*u-chuy-u-Ø*	2IND	1.g.i	C Dr.	2c	E1	Yucatan	11.04	(Anders and Deckert 1975: 2)

ch'ab – VER.TR.R: "to create"

u=CH'AB=ya	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	29c	A1	Yucatan	11.04	(Anders and Deckert 1975: 29)
u=CH'AB=ya	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	29c	C1	Yucatan	11.04	(Anders and Deckert 1975: 29)
u=CH'AB=ya	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	29c	E1	Yucatan	11.04	(Anders and Deckert 1975: 29)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	30c	A1	Yucatan	11.04	(Anders and Deckert 1975: 30)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	30c	C1	Yucatan	11.04	(Anders and Deckert 1975: 30)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	31c	C1	Yucatan	11.04	(Anders and Deckert 1975: 31)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	31c	E1	Yucatan	11.04	(Anders and Deckert 1975: 31)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	32c	A1	Yucatan	11.04	(Anders and Deckert 1975: 32)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	32c	C1	Yucatan	11.04	(Anders and Deckert 1975: 32)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	32c	E1	Yucatan	11.04	(Anders and Deckert 1975: 32)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	33c	A1	Yucatan	11.04	(Anders and Deckert 1975: 33)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	34c	A1	Yucatan	11.04	(Anders and Deckert 1975: 34)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	34c	C1	Yucatan	11.04	(Anders and Deckert 1975: 34)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	34c	E1	Yucatan	11.04	(Anders and Deckert 1975: 34)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	34c	G1	Yucatan	11.04	(Anders and Deckert 1975: 34)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	35c	A1	Yucatan	11.04	(Anders and Deckert 1975: 35)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	35c	C1	Yucatan	11.04	(Anders and Deckert 1975: 35)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	35c	E1	Yucatan	11.04	(Anders and Deckert 1975: 35)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	36c	A1	Yucatan	11.04	(Anders and Deckert 1975: 36)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	36c	C1	Yucatan	11.04	(Anders and Deckert 1975: 36)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	36c	E1	Yucatan	11.04	(Anders and Deckert 1975: 36)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	37c	A1	Yucatan	11.04	(Anders and Deckert 1975: 37)
u=CH'AB=ya	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	37c	C1	Yucatan	11.04	(Anders and Deckert 1975: 37)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	37c	E1	Yucatan	11.04	(Anders and Deckert 1975: 37)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	38c	A1	Yucatan	11.04	(Anders and Deckert 1975: 38)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	38c	C1	Yucatan	11.04	(Anders and Deckert 1975: 38)
u-u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	38c	E1	Yucatan	11.04	(Anders and Deckert 1975: 38)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	39c	A1	Yucatan	11.04	(Anders and Deckert 1975: 39)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	39c	C1	Yucatan	11.04	(Anders and Deckert 1975: 39)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	39c	E1	Yucatan	11.04	(Anders and Deckert 1975: 39)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	40c	A1	Yucatan	11.04	(Anders and Deckert 1975: 40)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	40c	C1	Yucatan	11.04	(Anders and Deckert 1975: 40)
u=CH'AB=ya	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	40a	C1	Yucatan	11.04	(Anders and Deckert 1975: 40)

u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	40a	E1	Yucatan	11.04	(Anders and Deckert 1975: 40)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	40c	E1	Yucatan	11.04	(Anders and Deckert 1975: 40)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	41c	A1	Yucatan	11.04	(Anders and Deckert 1975: 41)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	41a	C1	Yucatan	11.04	(Anders and Deckert 1975: 41)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	41c	C1	Yucatan	11.04	(Anders and Deckert 1975: 41)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	41c	E1	Yucatan	11.04	(Anders and Deckert 1975: 41)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	43a	A1	Yucatan	11.04	(Anders and Deckert 1975: 43)
u=CH'AB=wa	*u-ch'ab[-a]-Ø*	2IND	2.e.i	C Dr.	43a	C1	Yucatan	11.04	(Anders and Deckert 1975: 43)
u=ch'a-ba=wa	*u-ch'ab-a-Ø*	2IND	1.a.i	CPN	K4655	C1	Motagua	09.17	(Linda Schele SD 1041)
ti CH'AB=yi	*ti ch'ab-y-i[h]*	2MED	2.f.ii	YAX	Lnt. 17	B1	Usumacinta	09.16	(Graham and von Euw 1977: 43)
ti CH'AB=yi=hi	*ti ch'ab-y-ih*	2MED	2.f.ii	YAX	St. 35	B1	Usumacinta	09.15	(Ian Graham n.p.)

ch'aj – ADJ: "bitter"

ch'a-ja=la	*ch'aj-al*	1ATTR	1.a.i	COL	K1303	M1	?	?	n/a
ch'a-ja=la	*ch'aj-al*	1ATTR	1.a.i	COL	K1339	B1	?	?	(Robicsek and Hales 1982: #140)

ch'ak – VER.TR.R: "to axe"

CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	ALH	Jd. 1	A2	Hondo	09.07	(Mathews and Pendergast 1979: fig. 2)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Dr.	36a	F2	Yucatan	11.04	(Anders and Deckert 1975: 36)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Dr.	44b	A1	Yucatan	11.04	(Anders and Deckert 1975: 44)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Dr.	45b	A1	Yucatan	11.04	(Anders and Deckert 1975: 45)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Dr.	45b	C1	Yucatan	11.04	(Anders and Deckert 1975: 45)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Dr.	45b	E1	Yucatan	11.04	(Anders and Deckert 1975: 45)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	C Ma.	96d	E1	Yucatan	11.11	(Anders 1967: 96)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	C Ma.	97a	A1	Yucatan	11.11	(Anders 1967: 97)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	C Ma.	97a	C1	Yucatan	11.11	(Anders 1967: 97)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	C Ma.	97a	E1	Yucatan	11.11	(Anders 1967: 97)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	97b	A1	Yucatan	11.11	(Anders 1967: 97)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	97b	C1	Yucatan	11.11	(Anders 1967: 97)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	97b	E1	Yucatan	11.11	(Anders 1967: 97)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	98b	A1	Yucatan	11.11	(Anders 1967: 98)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	98b	B1	Yucatan	11.11	(Anders 1967: 98)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	98b	C1	Yucatan	11.11	(Anders 1967: 98)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	C Ma.	98b	E1	Yucatan	11.11	(Anders 1967: 98)
CH'AK-ka=ja PET	*ch'a<h>k-aj-Ø pet[en]*	1PASS	1.a.i	IXK	St. 2	C4	Mopan-Pusilha	09.17	(Graham 1980: 141)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	NAR	St. 12	B15	Central Peten	09.19	(Graham and von Euw 1975: 36)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	NAR	St. 12	C9	Central Peten	09.19	(Graham and von Euw 1975: 36)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	NAR	St. 12	D12a	Central Peten	09.19	(Graham and von Euw 1975: 36)
ch'a-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	PAL	TI-E	M8	Tabasco	09.12	(Robertson 1983b: fig. 95)
CH'AK-ka=ji=ya u=ba-hi	*ch'a<h>k-j-Ø=iy u-bah*	1PASS	2.f.ii	QRG	Zoo. G	L'3b	Motagua	09.17	(Looper 2001: fig. 4)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	TIK	St. 10	H9a	Central Peten	09.03	(Jones and Satterthwaite 1982: fig. 15b)

CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	TNA	Frieze	D1	Chiapas	?	(Martin and Grube 2000: 185)
i CH'AK=ja	*i['] ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	TRT	Mon. 6	F14	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
i CH'AK-ka=ja	*i['] ch'a<h>k-aj-Ø*	1PASS	1.a.i	TRT	Mon. 6	G1	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
CH'AK-ka=ja	*ch'a<h>k-aj-Ø*	1PASS	1.a.i	TRT	Mon. 8	B54	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
CH'AK=ja	*ch'a<h>k-[a]j-Ø*	1PASS	2.e.i	UXM	HS. 1	K1	Yucatan	10.03	(Graham 1992: 117)
CH'AK=ja=la	*ch'a<h>k-j-al-Ø*	1PASS	2.f.ii	XLM	P. 7	C1	Yucatan	09.15	(Graham and von Euw 1992: 185)
CH'AK=yi	*ch'ak-[a]y-i-Ø*	2MED	2.e.ii	IXK	St. 4	A2	Mopan-Pusilha	09.17	(Graham 1980: 147)
CH'AK-ka=wa ka-ba	*ch'ak-a[w]-Ø kab*	2ANTIP	1.a.i	SBP	HS. 1 I	A33-A34	Yucatan	10.01	(Grube, Pallán and Benavides 2010: pl. 2)

ch'am ~ k'am – VER.TR.R: "to take"

CH'AM=wi K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.ii	CLK	Frg. 37	A2	Central Campeche	09.16	(Simon Martin n.p.)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1649	A1-A2	?	?	(Robicsek and Hales 1982: #5)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K8680	A2	?	?	n/a
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1371	A2	Central Peten	?	(Martin 1997: fig. 1b)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	A2	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	A6	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K4011	B1	?	?	(Kerr 1992: 450)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1371	B4	Central Peten	?	(Martin 1997: fig. 1b)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1384	C1	?	?	(Robicsek and Hales 1982: #37)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K2572	C3	?	?	(Kerr 1990: 244)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	C5	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	D2	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	E4	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	F1	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	F6	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	G5	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	H2	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1371	I1	Central Peten	?	(Martin 1997: fig. 1b)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K1371	K4	Central Peten	?	(Martin 1997: fig. 1b)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	K6	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	COL	K6751	L3a	Central Peten	?	(Martin 1997: fig. 1a)
CH'AM=wa tzi-ki	*ch'am-[a]w-Ø tzik*	2ANTIP	2.e.i	CPN	St. J	A3b	Mopan-Pusilha	09.13	(Schele and Mathews 1998: fig. 4.5)
CH'AM-ma=wi ?-a	*ch'am-aw-Ø ?*	2ANTIP	1.a.ii	DPL	HS. 2 C II	E1a	Pasion	09.12	(Fahsen 2002: fig. 6)
CH'AM=wa K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.i	MTL	St. 4	pE5	Central Peten	09.12	(Tokovinine and Zender 2012: fig. 2.3d)
CH'AM=wa	*ch'am-[a]w-Ø*	2ANTIP	2.e.i	PNG	P. DOAKS 1	I5a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
$^{ch'a}$CH'AM=wa	*ch'am-[a]w-Ø*	2ANTIP	2.e.i	PNG	P. 2	H1	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)
CH'AM=wa=ya	*ch'am-w-Ø=[i]y*	2ANTIP	2.f.ii	PNG	P. 2	O2	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)
i CH'AM=wa	*ch'am-[a]w-Ø*	2ANTIP	2.e.i	PNG	P. 2	W4	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)
CH'AM=wi AJAW=le	*ch'am-[a]w-Ø ajaw-le[l]*	2ANTIP	2.e.ii	PRU	St. 27	E1	Central Peten	09.15	(Guenter 2004: fig. 9)
CH'AM=wi K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.ii	PRU	St. 30	pA2a	Central Peten	09.13	(Mayer 1984: pl. 183)
CH'AM=wi K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.ii	PRU	St. 34	B3	Central Peten	09.13	(Miller 1974: 151)
CH'AM=wa ?	*ch'am-[a]w-Ø ?*	2ANTIP	2.e.i	QRG	St. E	B14	Motagua	09.17	(Looper 2003: fig. 4.41)

CH'AM=wi K'AWIL	*ch'am-[a]w-Ø k'awil*	2ANTIP	2.e.ii	QRG	St. F	B6	Motagua	09.16	(Looper 2003: fig. 4.6)
CH'AM=wa K'UH	*ch'am-[a]w-Ø k'uh*	2ANTIP	2.e.i	SBL	Str. A-14 T6	G'1a	Pasion	09.16	(Graham 1990: fig. 1)
CH'AM=wa	*ch'am-[a]w-Ø*	2ANTIP	2.e.i	TIK	St. 25	E2	Central Peten	09.04	(Jones and Satterthwaite 1982: fig. 43)
u=ch'aCH'AM=wi ?-wa	*u-ch'am-[a]w-Ø ?*	2IND	2.e.ii	AGT	St. 16	C1	Pasion	09.10	(Houston 2014: fig. 12.11)
u=k'a-ma	*u-k'am-a-Ø*	2IND	1.g.i	C Dr.	2d	A1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=K'AM=wa	*u-k'am-a-Ø*	2IND	2.e.i	C Dr.	67a	C1	Yucatan	11.04	(Anders and Deckert 1975: 67)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	CNC	HS. 1 s1	pB2	Southern Peten	09.13	(Mayer 1995: pl.8)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	COL	K1003	A2	?	?	(Robicsek and Hales 1982: #19)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	COL	K1882	C1	?	?	(Robicsek and Hales 1982: #37a)
u=CH'AM-ma=K'AWIL	*u-ch'am-a-Ø k'awil*	2IND	1.g.i	CPN	Alt. Q	A2	Motagua	09.17	(Schele 1989a: fig. 1)
u=CH'AM=wa TUNni	*u-ch'am-[a]-Ø tun*	2IND	2.e.i	CPN	St. E	C4	Motagua	09.05	(Schele 1990b: fig. 5b)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	CRC	Alt. 13	3	Mopan-Pusilha	09.09	(Grube and Martin 2004: 85)
u=CH'AM=wa LAKAM TUNni	*u-ch'am-[a]-Ø lakam tun*	2IND	2.e.i	CRC	Alt. 17	3-4	Mopan-Pusilha	09.11	(Grube 1994a: fig. 9.4)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	DPL	St. 8	F15	Pasion	09.14	(Houston 1993: fig. 4.14)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	MTL	K1546	A1	Central Peten	?	(Robicsek and Hales 1982: #141)
ni=CH'AM=wa	*ni-ch'am-a-Ø*	2IND	2.e.i	NAR	K1398	D2	Central Peten	09.13	(Kerr 1989: 81)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	NAR	K1398	N1	Central Peten	09.13	(Kerr 1989: 81)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	NMP	St. 2	A2	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
u=CH'AM=wi	*u-ch'am[-a]-Ø*	2IND	2.e.ii	OXP	St. 11	B2	Central Campeche	09.15	(Grube 2008: fig. 8.35)
u=CH'AM-ma	*u-ch'am-a-Ø*	2IND	1.g.i	OXP	St. 18	D4	Central Campeche	09.16	(Grube 2008: fig. 8.44)
u=CH'AM=wi	*u-ch'am[-a]-Ø*	2IND	2.e.ii	OXP	St. 19	C6	Central Campeche	09.16	(Grube 2008: fig. 8.46)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	PAL	T14T	B8	Tabasco	09.13	(Robertson 1991: fig. 176)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	PAL	PT	H11	Tabasco	09.14	(Robertson 1985b: fig. 258)
u=CH'AM-ma=wa	*u-ch'am-a-Ø*	2IND	1.a.i	PAL	T19B-S	P3	Tabasco	09.15	(Stuart 2005b: pl. 2)
u=CH'AM=wa TUN	*u-ch'am-[a]-Ø tun*	2IND	2.e.i	PMA	St. 5	A3	Chiapas	09.16	(Stuart 2010: fig. 12.4)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	PNG	St. 1	D14	Usumacinta	09.13	(Stuart and Graham 2003: 20)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	PNG	St. 3	E3	Usumacinta	09.14	(Stuart and Graham 2003: 26)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	QRG	Alt. O'	G'2b	Motagua	09.18	(Jones 1983)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	QRG	St. J	H5	Motagua	09.16	(Looper 2003: fig. 3.30b)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	RAZ	Jd. Celt 1	B3	Central Peten	09.00	(Grube and Martin 2001: 48)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	RAZ	St. 2	D3	Central Peten	09.11	(Adams 1999: fig. 3-45)
u=CH'AM=wa	*u-ch'am-a-Ø*	2IND	2.e.i	TIK	St. 31	E12	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)

ch'en-a – VER.TR.D: "to dig"

u=CH'EN=na=ja	*u-ch'en-n-aj-Ø-Ø*	1PASS	4.a.i	CPN	St. P	D4	Motagua	09.09	(Schele and Stuart 1986a: fig. 3)

ch'ich' ~ k'ik' – NOUN: "blood"

CH'ICH'=CH'EN=ja	*ch'ich'-ch'en-aj-Ø*	1INCH	2.e.i	DPL	St. 16	D4a	Pasion	09.15	(Graham 1967: fig. 6)
CH'ICH'=le	*ch'ich'-[e]l*	1POSS	2.e.i	COL	K1457	G4	Central Peten	09.10	(Robicsek and Hales 1982: #130)
u=CH'ICH'=le	*u-ch'ich'-[e]l*	1POSS	2.e.i	CPN	HS. 1 XII	J1b	Motagua	09.16	(Barbara Fash n.p.)
u=KOKAN=CH'ICH=le	*u-kokan-ch'ich'-[e]l-Ø*	1POSS	2.e.i	CRC	St. 21	C3a	Mopan-Pusilha	09.13	(Martin and Grube 2000: 94)

u=CH'ICH'=le	*u-ch'ich'-[e]l*	1POSS	2.e.i	DPL	HS. 2 W III	D1b	Pasion	09.12	(Fahsen 2002: fig. 8)
u=CH'ICH'=le	*u-ch'ich'-[e]l*	1POSS	2.e.i	PAL	T19B-S	E5	Tabasco	09.15	(Stuart 2005b: pl. 2)
CH'ICH'=la	*ch'ich'-[e]l*	1POSS	2.e.ii	SUF	M. 7	C9	Central Peten	08.17	(Estrada-Belli et al. 2009: fig. 5)
k'i-k'i=yi	*k'ik'=iy-Ø*	2INCH	1.a.i	PUS	St. D	F8	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)

ch'ob – NOUN

ch'o-ba=ja	*ch'ob-aj-Ø*	1INCH	1.b.i	C Dr	39b	A1	Yucatan	11.04	(Anders and Deckert 1975: 39)

ch'oy – NOUN

ch'o-ya=ja	*ch'oy-aj-Ø*	1INCH	1.b.i	C Dr.	58	E3	Yucatan	11.04	(Anders and Deckert 1975: 58)
ch'o-ya=ja	*ch'oy-aj-Ø*	1INCH	1.b.i	C Dr.	58	E7	Yucatan	11.04	(Anders and Deckert 1975: 58)

ch'ub-i – VER.TR.D: "to deposit, to care"

a=ch'u-bi=ji	*a-ch'ub-ij-Ø*	4TEMP	1.c.i	PNG	P. 3	Y2-X3	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)

e[h]m – VER.INTR: "to descend"

e-mi=ya	*e[h]m-[e]y-Ø*	2COM	2.c.i	C Pa.	17b	C2	Yucatan	10.18	(Anders 1968: 17)
EM=ye	*e[h]m-[e]y-Ø*	2COM	2.e.i	COL	Trn. Amparo	A2	?	?	(Zender 2005b: fig. 9)
EM=ye	*e[h]m-[e]y-Ø*	2COM	2.e.i	COL	K7821	P2	?	?	(Kerr and Kerr 2000: 1010)
EM=ye	*e[h]m-[e]y-Ø*	2COM	2.e.i	TIK	T. 4 Lnt. 2	B4	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 73)
i EM=ye	*i e[h]m-[e]y-Ø*	2COM	2.e.i	TRT	Mon. 6	E10a	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
ye=ma=la	*y-e[h]m-al-Ø*	3NMLS	1.b.i	PAL	T18S	F8	Tabasco	09.14	(Schele and Mathews 1979: no. 472)
ye=ma=lo	*y-e[h]m-al-Ø*	3NMLS	1.b.ii	QRG	St. D	A20a	Motagua	09.17	(Looper 2003: fig. 4.28)

e[h]t-a – VER.TR.D

ye=ta=ja	*y-e[h]t-aj-Ø*	4TEMP	1.c.i	JMB	St. 1	Y1	Central Peten	10.02	(Jones and Satterthwaite 1982: fig. 78)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	NGJ1	G	Tabasco	09.11	(Schele and Mathews 1979: no. 39)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	PT	Q17	Tabasco	09.14	(Robertson 1985b: fig. 258)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	T19B-S	G1	Tabasco	09.15	(Stuart 2005b: pl. 2)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	T21B-P	D9	Tabasco	09.15	(Stuart 2006b: 187)
ye=TE'=je	*y-e[h]t-ej-Ø*	4TEMP	1.d.i	PAL	TABL	G2	Tabasco	09.11	(Schele and Mathews 1979: no. 36)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	U055	pA2	Tabasco	09.13	(Schele and Miller 1986: pl. 21a)
ye=ET=ji	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PAL	U055	pA5	Tabasco	09.13	(Schele and Miller 1986: pl. 21a)
ye=ET=je	*y-e[h]t-[a]j-Ø*	4TEMP	2.e.ii	PMT	St. 7	D9	Tabasco	09.16	(Bíró 2011a: fig. 227)
ye=ta=ji	*y-e[h]t-aj-Ø*	4TEMP	1.c.ii	UXL	St. 8	3b	Central Campeche	?	(Grube 2008: fig. 8.53)
ye=ta=ji	*y-e[h]t-aj-Ø*	4TEMP	1.c.ii	UXL	St. 8	8a	Central Campeche	?	(Grube 2008: fig. 8.53)
ye=ta=ji	*y-e[h]t-aj-Ø*	4TEMP	1.c.ii	UXL	St. 8	13b	Central Campeche	?	(Grube 2008: fig. 8.53)

ek – POS: “place, insert”

e-ke=li=bi	*ek-l-ib*	3INSTR	1.f.ii	CRN	P. 2	O8	Central Peten	09.12	(Mayer 1995: pl. 191)

el – VER.INTR: “to burn”

i EL-le=NAH=ja	*i['] el-Ø+nah-[a]j-Ø*	1INCH	2.e.i	CRN	P. 2	N5-M6	Central Peten	09.12	(Mayer 1995: pl. 161)
i EL=NAH=ja	*i['] el-Ø+nah-[a]j-Ø*	1INCH	2.e.i	TNA	Mon. 141	D3	Chiapas	09.13	(Graham and Mathews 1999: 173)

hil – VER.TR.R: “to rest”

u=hi-li OK	*u-hil-i-Ø ok*	2IND	1.g.i	TRT	Mon. 8	A9	Tabasco	09.10	(Gronemeyer 2006b: pl. 14)

hix – NOUN: “jaguar”

^{hi}HIX=li ^{a}AJAW^{wa}	*hix-il ajaw-Ø*	1ATTR	2.e.i	CML	U. 26. Sp. 3	A1-A2	Tabasco	09.17	(Marc Zender n.p.)

hul – VER.INTR: “to come”

HUL=OK=ja	*hul-Ø+ok-aj-Ø*	1INCH	2.e.i	TIK	St. 31	C21	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
HUL=ye	*hul-[e]y-Ø*	2COM	2.e.i	TIK	Marcador	B7	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
HUL=ye	*hul-[e]y-Ø*	2COM	2.e.i	TIK	Marcador	D1	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
HUL=ye	*hul-[e]y-Ø*	2COM	2.e.i	TIK	Marcador	G5	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
HUL-le=li=ji=ya	*hul-el-Ø=ij=iy*	3NMLS	1.a.ii	CPN	Alt. F'	A3b	Motagua	09.18	(Schele 1989b: fig. 1)

il-a – VER.TR.D: “to see”

IL-la=ja	*il-aj-Ø*	1PASS	1.c.i	AGC	St. 1	C2	Pasion	09.18	(Martin 2005a: fig. 7c)
i-la=ja	*il-aj-Ø*	1PASS	1.c.i	CKL	Mon. 28	A1	Chiapas	09.10	(Navarrete 1984: fig. 74)
IL=ji=ji	*il-[a]j-Ø=ij=i[y]*	1PASS	2.e.ii	CLK	St. 33	G5	Central Campeche	09.11	(Simon Martin n.p.)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	CLK	St. 89	C9	Central Campeche	09.15	(Mayer 1989: pl. 7)
IL-la=ja	*il-aj-Ø*	1PASS	1.c.i	CNC	P. 1	O5	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
i-la=ja	*il-aj-Ø*	1PASS	1.c.i	COL	K4372	D1	?	?	n/a
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	COL	P. Tikal	Ap4	Central Peten	09.13	(Mayer 1991: pl. 157)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	CPN	Alt. I'	G2a	Motagua	09.12	(Grube and Martin 2001: 7)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	CPN	St. P	A10a	Motagua	09.09	(Schele and Stuart 1986a: : fig. 3)
i-IL=a=ya	*il-a[j]-Ø=[i]y*	1PASS	1.g.i	CPN	HS. 1 XXXV	H1	Motagua	09.16	(Barbara Fash n.p.)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	CPN	St. 6	D1	Motagua	09.12	(McCready et al. 1988: fig. 3)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	CPN	T. 11 WDNP	A4	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 12)
IL=AJ^{ja}	*il-aj-Ø*	1PASS	1.e.iv	CRC	C4B	37-8	Mopan-Pusilha	09.18	(Grube 1994a: fig. 9.19d)
IL=AJ	*il-aj-Ø*	1PASS	1.e.iv	CRC	St. 19	L4	Mopan-Pusilha	09.19	(Grube 1994a: fig. 9.6)
IL-la=a	*il-a[j]-Ø*	1PASS	1.g.i	DPL	P. 7	B4	Pasion	09.12	(Houston 1993: fig. 5.11)

IL-la=ja=ya	*il-aj-Ø=[i]y*	1PASS	1.c.i	JAI	P. 1	A1	Yucatan	09.11	(Mayer 1989: pl. 27)
IL=NAH	*il-n-aj-Ø*	1PASS	1.f.iv	MQL	St. 3	G3b	Southern Peten	09.19	(Graham 1967: fig. 49)
IL=ja	*il-[a]j-Ø*	1PASS	2.e.i	MQL	St. 7	E5b	Southern Peten	10.00	(Graham 1967: fig. 57)
IL-la=ji	*il-aj-Ø*	1PASS	1.c.ii	NAR	St. 3	E11	Central Peten	09.14	(Graham and von Euw 1975: 18)
IL=ya	*il[-aj]-Ø=[i]y*	1PASS	2.g.i	NTN	Dwg. 23	A3	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.6)
IL=ji=ya	*il-[a]j-Ø=iy*	1PASS	2.e.ii	NTN	Dwg. 24	A3	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.7)
IL=ja	*il-[a]j-Ø*	1PASS	2.e.i	NTN	Dwg. 25	A3	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.11)
i-la=ja	*il-aj-Ø*	1PASS	1.c.i	NTN	Dwg. 65	H4	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)
IL^{li}=a-ja	*il-aj-Ø*	1PASS	1.e.i	NTN	Dwg. 66	B1	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.12)
IL-la=a-ja	*il-aj-Ø*	1PASS	1.e.i	NTN	Dwg. 70	B1	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.13)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	PAL	COL Frg.	B1a	Tabasco	09.16	(Polyukhovich 2013: fig. 1)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	PAL	SCR	B1	Tabasco	09.15	(Schele and Mathews 1979: no. 142)
ma IL=ji	*ma['] il-[a]j-Ø*	1PASS	2.e.ii	PAL	TFC	G8	Tabasco	09.12	(Robertson 1991: fig. 153)
^{i}IL=a-ji=ya	*il-aj-Ø=iy*	1PASS	1.e.ii	PAL	TI-W	J1	Tabasco	09.12	(Robertson 1983b: fig. 97)
IL-la	*il-a[j]-Ø*	1PASS	1.g.i	PNG	P. DOAKS 1	J6a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
IL-la=AJ	*il-aj-Ø*	1PASS	1.e.iv	PRU	St. 15	Ep3	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
IL-la=AJ	*il-aj-Ø*	1PASS	1.e.iv	PRU	St. 15	Ep6	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
IL-la=ji	*il-aj-Ø*	1PASS	1.c.ii	QRG	Alt. L	G2	Motagua	09.11	(Looper 2003: fig. 1.20)
IL-la=ji	*il-aj-Ø*	1PASS	1.c.ii	QRG	St. D	A22b	Motagua	09.17	(Looper 2003: fig. 4.26)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	REI	HS. 1 A	pA4	Western Peten	09.13	(Stuart 2012a: fig. 4)
IL-la=AJ	*il-aj-Ø*	1PASS	1.e.iv	SBL	St. 10	B7	Pasion	10.01	(Graham 1996: 32)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	TNA	Mon. 170	K1	Chiapas	09.16	(Graham and Henderson 2006: 115)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	TNA	Mon. 170	N1	Chiapas	09.16	(Graham and Henderson 2006: 115)
IL=ji	*il-[a]j-Ø*	1PASS	2.e.i	TNA	Mon. 173	A5	Chiapas	09.09	(Graham and Henderson 2006: 118)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	TNA	Mon. 176	Ap3	Chiapas	09.16	(Graham and Henderson 2006: 121)
ma-a IL=a-ji	*ma' il-aj-Ø*	1PASS	1.e.ii	TRT	Bx. 1	C2-D2	Tabasco	09.12	(Gronemeyer 2006b: pl. 1)
IL-li=a-ji	*il-aj-Ø*	1PASS	1.e.ii	TRT	Mon. 1	B4by	Tabasco	09.11	(Gronemeyer 2006b: pl. 5)
i-IL=ji	*il-[a]j-Ø*	1PASS	2.e.ii	UAX	St. 22	B2	Central Peten	09.03	(Graham 1986: 191)
yi=li=wa	*y-il-[a]-Ø*	2IND	2.d.i	CHN	MON-L2	A1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 56)
yi=li=wa	*y-il-[a]-Ø*	2IND	2.d.i	CHN	MON-L4	A1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
yi=li=wa	*y-il-[a]-Ø*	2IND	2.d.i	CHN	MON-L5	A1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 59)
yi=li=wa	*y-il-[a]-Ø*	2IND	2.d.i	CHN	T4L-L2	D2	Yucatan	10.02	(Krochock 1989: fig. 5)
yi=IL	*y-il[-a]-Ø*	2IND	2.g.ii	COL	K8076	L2	?	?	(Kerr and Kerr 2000: 1016)
yi=IL=wa	*y-il-[a]-Ø*	2IND	2.e.i	UXL	St. 13	D6	Central Campeche	09.11	(Grube 2008: fig. 8.60)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	CLK	St. 8	A9	Central Campeche	09.14	(Ian Graham n.p.)
yi=IL-la=ji=ya	*y-il-aj-Ø=iy*	4TEMP	1.c.ii	CNK	P. Crystal River	pB3	Tabasco	09.15	(Alexandre Safronov n.p.)
yi=IL=ji=ya	*y-il-[a]j-Ø=iy*	4TEMP	2.e.ii	COL	P. Houston	E1	Usumacinta	09.03	(Mayer 1984: pl. 27)
yi=la=ji	*y-il-aj-Ø*	4TEMP	1.c.ii	CPN	T. 11 WDNP	B6	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 12)
yi=IL=a	*y-il-a[j]-Ø*	4TEMP	1.g.i	CRC	St. 3	C12a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
yi=IL=a-ji	*y-il-aj-Ø*	4TEMP	1.e.ii	CRC	St. 6	B20	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 7)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	CRN	HS. 2 VII	B4	Central Peten	09.14	(Mayer 1995: pl. 81)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	CRN	HS. 2 XIII	B1	Central Peten	09.14	(Mayer 1987: pl. 30)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	DPL	St. 8	H16a	Pasion	09.14	(Houston 1993: fig. 4.14)

yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	DPL	P. 19	F1a	Pasion	09.14	(Houston 1993: fig. 4.19)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	IXZ	St. 4	A5a	Mopan-Pusilha	09.17	(Graham 1980: 181)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	IXZ	St. 4	B5a	Mopan-Pusilha	09.17	(Graham 1980: 181)
yi=IL=a	*y-il-a[j]-Ø*	4TEMP	1.g.i	NAR	St. 13	D10	Central Peten	09.17	(Graham and von Euw 1975: 37)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	NTN	Dwg. 28	A3	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.10)
yi=IL=a	*y-il-a[j]-Ø*	4TEMP	1.g.i	NTN	Dwg. 29	A3	Mopan-Pusilha	09.17	(MacLeod and Stone 1994: fig. 7.8)
yi=IL=ji=ya	*y-il-[a]j-Ø=iy*	4TEMP	2.e.ii	PAL	TC	T8	Tabasco	09.12	(Robertson 1991: fig. 9)
yi=li=a-ji	*y-il-aj-Ø*	4TEMP	1.e.ii	PAL	TI-E	M4	Tabasco	09.12	(Robertson 1983b: fig. 95)
yi=li=a-ji	*y-il-aj-Ø*	4TEMP	1.e.ii	PAL	TI-M	C3	Tabasco	09.12	(Robertson 1983b: fig. 96)
yi=li=a-ji	*y-il-aj-Ø*	4TEMP	1.e.ii	PAL	TI-M	H2	Tabasco	09.12	(Robertson 1983b: fig. 96)
i yi=li=a-ji	*i['] y-il-aj-Ø*	4TEMP	1.e.ii	PAL	TI-W	I4	Tabasco	09.12	(Robertson 1983b: fig. 97)
i yi=li=a-ji	*i['] y-il-aj-Ø*	4TEMP	1.e.ii	PAL	TI-W	K1	Tabasco	09.12	(Robertson 1983b: fig. 97)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	PMT	P. Y	pA2	Tabasco	09.17	(Lizardi Ramos 1963: fig. 7)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	PMT	P. Y	pD1	Tabasco	09.17	(Lizardi Ramos 1963: fig. 7)
yi=IL=ji=ya	*y-il-[a]j-Ø=iy*	4TEMP	2.e.ii	PMT	Mon. 8	pD2	Tabasco	09.13	(Bíró 2011a: fig. 58)
yi=IL=ji=ji=ya	*y-il-[a]j-Ø=ij=iy*	4TEMP	2.e.ii	PNG	Alt. 1	F2	Usumacinta	09.13	(Teufel 2004: 535)
yi=IL=ji=ya	*y-il-[a]j-Ø=iy*	4TEMP	2.e.ii	PNG	Alt. 1	O1	Usumacinta	09.13	(Teufel 2004: 535)
yi=la=ji	*y-il-aj-Ø*	4TEMP	1.c.ii	PNG	P. 3	J1	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	QRG	St. E	A20a	Motagua	09.17	(Looper 2003: fig. 4.41)
yi=li=a-ji=ya	*y-il-aj-Ø=iy*	4TEMP	1.e.ii	QRG	St. E	C14a	Motagua	09.17	(Looper 2003: fig. 4.38)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	QRG	Zoo. G	H'1a	Motagua	09.17	(Looper 2001: fig. 3)
yi=IL=ji	*y-il-[a]j-Ø*	4TEMP	2.e.ii	SBL	Str. A-14 T6	J'1a	Pasion	09.16	(Graham 1990: fig. 1)
yi=IL-la=ja	*y-il-aj-Ø*	4TEMP	1.c.i	UAX	St. 13	A4	Central Peten	10.00	(Graham 1986: 163)
yi=IL^{li}=ji	*y-il-[a]j-Ø*	4TEMP	2.d.i	UXL	St. 12	B7	Central Campeche	09.11	(Grube 2008: fig. 8.59)

ip – NOUN: "strength"

9 i-pi=ja	*balun ip-[a]j-Ø*	1INCH	2.a.i	CPN	St. A	C6a	Motagua	09.14	(Alexander 1988: fig. 1)
9 i-pi=ja	*balun ip-[a]j-Ø*	1INCH	2.a.i	PAL	T14T	A6	Tabasco	09.13	(Schele and Miller 1986: fig. VII.2)

ip-a – VER.TR.D: "to strengthen"

9 i-pi=na=ja	*balun ip-n-aj-Ø*	1PASS	1.f.ii	PAL	T14T	F2	Tabasco	09.13	(Schele and Miller 1986: fig. VII.2)
9 IP=na=ja	*balun ip-n-aj-Ø*	1PASS	1.f.ii	TRT	Mon. 6	G7	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)

it-a – VER.TR.D: "to accompany"

i-ta=ja	*it-aj-Ø*	1PASS	1.c.i	CRC	St. 22	L13	Mopan-Pusilha	09.10	(Grube 1994a: fig. 9.3)
i-ta=ji	*it-aj-Ø*	1PASS	1.c.ii	QRG	Zoo. P	7-A2	Motagua	09.18	(Looper 2001: fig. 29)
yi=ta	*y-it-a-Ø*	2IND	1.g.i	COL	St. Hauberg	D1	Central Peten	08.07	(Schele, Mathews and Lounsbury 1990: 2)
yi=ta	*y-it-a-Ø*	2IND	1.g.i	CPN	Alt. Q	D4	Motagua	09.17	(Schele 1989a: fig. 1)
yi=ta	*y-it-a-Ø*	2IND	1.g.i	CRC	St. 16	C12	Mopan-Pusilha	09.05	(Beetz and Satterthwaite 1981: fig. 15b)
yi=ta	*y-it-a-Ø*	2IND	1.g.i	NAR	St. 13	D5	Central Peten	09.17	(Graham and von Euw 1975: 37)

yi=ta	*y-it-a-Ø*	2IND	1.g.i	TIK	Marcador	D2	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
yi=ta=ya	*y-it-[aj]-Ø=[i]y*	4TEMP	2.g.ii	ALM	St. 10	B1	Central Peten	09.15	(Grube 2008: fig. 8.1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	BPK	ScS. 5	H1	Usumacinta	09.16	(Alexandre Safronov n.p.)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CAY	Alt. 4	F1	Usumacinta	09.15	(Mathews 1998: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	IS-LF	E1	Yucatan	10.02	(Krochock 1989: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	IS-LF	G1	Yucatan	10.02	(Krochock 1989: fig. 1)
yi=ta=je	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	MON-L2	Z1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 56)
yi=ta=je	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	MON-L6	Z1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 60)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	E4	Yucatan	10.03	(Voß and Kremer 2000: fig. 15)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	I3	Yucatan	10.03	(Voß and Kremer 2000: fig. 15)
yi=ta=je	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	J6	Yucatan	10.03	(Voß and Kremer 2000: fig. 15)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	K2	Yucatan	10.03	(Voß and Kremer 2000: fig. 15)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	L4	Yucatan	10.03	(Voß and Kremer 2000: fig. 15)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 1	P11a	Yucatan	10.03	(Graña-Behrens 2002: pl. 27)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	St. 2	D6	Yucatan	10.03	(Graña-Behrens 2002: pl. 28)
yi=ta=je	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	T4L-L1	G4	Yucatan	10.02	(Krochock 1989: fig. 4)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	T4L-L2	G1	Yucatan	10.02	(Krochock 1989: fig. 5)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	T4L-L2	G4	Yucatan	10.02	(Krochock 1989: fig. 5)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CHN	T4L-L3	D5	Yucatan	10.02	(Krochock 1989: fig. 6)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CLK	St. 51	B2a	Central Campeche	09.14	(Martin and Grube 2000: 113)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CML	U. 26 Pdt. 14	A6	Tabasco	09.17	(Martin Zender n.p.)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CNC	BcM. 2	B5	Southern Peten	09.13	(Ramzy Barrois n.p.)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	COL	P. Brussels	B4b	Usumacinta	09.13	(Bíró 2005: fig. 4)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	COL	P. DOAKS 1	E2a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	COL	P. Tikal	A3a	Central Peten	09.13	(Mayer 1991: pl. 128)
yi=ta=hi	*y-it-ah-Ø*	4TEMP	1.a.ii	CPN	Alt. K	J2	Motagua	09.12	(Grube and MacLeod 1989: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CPN	Alt. U	H5b	Motagua	09.18	(Schele and Stuart 1986b: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CPN	Jd. Comayagua	C2	Tabasco	09.17	(Mayer 1997: fig. 19)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CPN	Mon. 19	K1a	Motagua	09.12	(Schele 1987f: fig. 3)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CPN	St. 6	B7b	Motagua	09.12	(McCready et al. 1988: fig. 1)
yi=ta=ja	*y-it-aj-Ø*	4TEMP	1.a.i	CRC	St. 3	D20a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRC	St. 6	B22	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 7)
yi=ta=hi	*y-it-ah-Ø*	4TEMP	1.a.ii	CRN	HS. 2 1-V	C7	Central Peten	09.14	(Stuart 2012d: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRN	HS. 2 XI	B1a	Central Peten	09.14	(Canuto and Barrientos 2010: fig. 4c)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRN	HS. 2 XXX	B2	Central Peten	09.12	(David Stuart n.p.)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRN	HS. 3 II	A2	Central Peten	09.13	(Martin and Stuart 2009: 25)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRN	HS. 3 III	C2	Central Peten	09.13	(Mayer 1989: pl. 102)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	CRN	HS. 3 VIII	B1	Central Peten	09.13	(Canuto et al. 2008: fig. 2.9)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	DPL	HS. 2 E II	E1b	Pasion	09.12	(Fahsen 2002: fig. 7)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	DPL	HS. 2 W II	C2a	Pasion	09.12	(Fahsen 2002: fig. 8)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	DPL	St. 11	E1a	Pasion	09.14	(Houston 1993: fig. 3.27)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	EKB	M. 96G	U3	Yucatan	09.16	(Lacadena 2002: fig. 18d)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	HLK	Lnt. 1	A8	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 43)

yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	HLK	Lnt. 1	pF2a	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 44)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	HLK	Lnt. 1	pH2a	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 44)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	ITN	St. 17	G6	Pasion	09.17	(Tokovinine and Zender 2012: fig. 2.10)
yi=ta	*y-it-a[j]-Ø*	4TEMP	1.g.i	JOL	Dwg. 8	B4	Tabasco	09.00	(Riese 1981: 56)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.i	JOL	Dwg. B	B4	Tabasco	09.02	(Grube, Martin and Zender 2002: 6)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	LTI	P. 2	C1	Usumacinta	09.16	(Mayer 1995: pl. 265)
yi=ta	*y-it-a[j]-Ø*	4TEMP	1.g.i	NAR	K1398	D3	Central Peten	09.13	(Kerr 1989: 81)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NAR	St. 2	E7	Central Peten	09.13	(Graham and von Euw 1975: 15)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NAR	St. 23	E13	Central Peten	09.14	(Graham and von Euw 1975: 60)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NAR	St. 23	G4	Central Peten	09.14	(Graham and von Euw 1975: 60)
yi=ta	*y-it-a[j]-Ø*	4TEMP	1.g.i	NAR	St. 29	F12	Central Peten	09.14	(Graham 1978: 78)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NAR	St. 3	E8	Central Peten	09.14	(Graham and von Euw 1975: 18)
yi=ta=ya	*y-it-[aj]-Ø=[i]y*	4TEMP	2.g.ii	NAR	St. 30	D13	Central Peten	09.14	(Graham 1978: 80)
yi=ta=ja	*y-it-aj-Ø*	4TEMP	1.a.i	NMP	St. 2	F1-E2	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 19	B1	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.14)
yi=ta=ji=ya	*y-it-aj-Ø=iy*	4TEMP	1.a.ii	NTN	Dwg. 23	B4	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.6)
yi=ta=ji=ya	*y-it-aj-Ø=iy*	4TEMP	1.a.ii	NTN	Dwg. 24	B1	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.7)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 25	B1	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.11)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 28	A11	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.10)
yi=ta=a	*y-it-a[j]-Ø*	4TEMP	1.g.i	NTN	Dwg. 28	A18	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.10)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 29	B1	Mopan-Pusilha	09.17	(MacLeod and Stone 1994: fig. 7.8)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 34	B3	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.26)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 52	A5	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.2)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 65	C4	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 65	E2	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 65	F4	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 88	D1	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 88	E1	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	NTN	Dwg. 88	F1	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	OXK	BcR. 1	pV1	Yucatan	09.14	(García Campillo 1994a: fig. 2)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	HCHS	C5a	Tabasco	09.11	(Robertson 1985b: fig. 319)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	HCHS	C8b	Tabasco	09.11	(Robertson 1985b: fig. 319)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	HCHS	D10a	Tabasco	09.11	(Robertson 1985b: fig. 319)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	PAQF	pA1	Tabasco	09.11	(Robertson 1991: fig. 217)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	T17T	A7a	Tabasco	09.12	(González and Fernández Martínez 1994)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	TCI2	l4	Tabasco	09.13	(Schele and Mathews 1979: no. 282)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PAL	TI-W	N9	Tabasco	09.12	(Robertson 1983b: fig. 97)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PMT	St. 7	C11	Tabasco	09.16	(Bíró 2011a: fig. 227)
yi=ta=ji=ya	*y-it-aj-Ø=iy*	4TEMP	1.a.ii	PNG	P. 16	C8	Usumacinta	09.12	(Teufel 2004: 527)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PNG	St. 12	Ap14b	Usumacinta	09.18	(Stuart and Graham 2003: 62)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PNG	St. 15	B13a	Usumacinta	09.17	(Teufel 2004: 390)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PNG	St. 25	I3	Usumacinta	09.08	(Proskouriakoff 1993: 48)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	PNH	St. 1	E3	Tabasco	10.00	(Ian Graham n.p.)

yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	POB	St. 3	C5	Quintana Roo	09.07	(Esparza Olguín and Pérez Gutiérrez 2009)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	QRG	Alt. O'	D'1a	Motagua	09.18	(Jones 1983)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	QRG	Alt. O'	K'2b	Motagua	09.18	(Jones 1983)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	QRG	St. D	C24b	Motagua	09.17	(Looper 2003: fig. 4.28)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	QRG	Str. 1B-1	H1	Motagua	09.19	(Schele and Looper 1996: 186)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	QRG	Str. 1B-1	S1	Motagua	09.19	(Schele and Looper 1996: 186)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	REI	HS. 1 B	pA3a	Western Peten	09.13	(Stuart 2012a: fig. 6)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	REJ	St. 1	F7	Mopan-Pusilha	09.10	(Grube and Martin 2004: 37)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	SBL	St. 21	A6	Pasion	10.01	(Graham 1996: 53)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	SBL	Str. A-14 T2	L1a	Pasion	09.16	(Graham 1990: fig. 1)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	SDM	Dwg. 1	A6	Mopan-Pusilha	?	(Brady and Fahsen 1991: 55)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TAM	St. 4	Bp2	Pasion	09.06	(Gronemeyer 2013: pl. 11)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TIK	St. 31	H17	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TIK	St. 31	H19	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TNA	Mon. 140	pN1a	Chiapas	09.13	(Graham and Mathews 1999: 171)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TNA	Mon. 140	pP1a	Chiapas	09.13	(Graham and Mathews 1999: 171)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TNA	Mon. 8	C6	Chiapas	09.12	(Mathews 1983: 30)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	TRT	Mon. 6	L6	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	UXM	Alt. 10	A3	Yucatan	10.03	(Graham 1992: 115)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	UXM	Alt. 10	B4	Yucatan	10.03	(Graham 1992: 115)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YAX	HS. 3 IV	C5	Usumacinta	09.15	(Graham 1982: 170)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YAX	Lnt. 23	I2	Usumacinta	09.14	(Graham 1982: 135)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YAX	St. 31	A4	Usumacinta	09.15	(Sven Gronemeyer 28-000018)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YUL	Lnt. 1	F8	Yucatan	10.02	(Love 1989a: fig. 2)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YUL	Lnt. 1	G6	Yucatan	10.02	(Love 1989a: fig. 2)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	YXH	St. 7	pB5	Central Peten	09.12	(Grube 2000c: fig. 200a)
yi=ta=ji	*y-it-aj-Ø*	4TEMP	1.a.ii	ZPB	K4692	A4	Western Peten	09.11	(Fitzsimmons 2012: fig. 3)

ixim – NOUN: "maize"

1=IXIM=ja	*jun+ixim-[a]j-Ø*	1INCH	2.e.i	COL	K2912	F	?	09.16	(Schele and Miller 1986: pl. 95a)
1=IXIM=ja	*jun+ixim-[a]j-Ø*	1INCH	2.e.i	COL	K2912	G	?	09.16	(Schele and Miller 1986: pl. 95a)
1=IXIM=ja	*jun+ixim-[a]j-Ø*	1INCH	2.e.i	COL	K2912	I	?	09.16	(Schele and Miller 1986: pl. 95a)

jam – VER.TR.R: "to open"

AJ [ja]-ma=li=bi	*aj jam-l-ib*	3INSTR	1.f.ii	YAX	Lnt. 23	J1	Usumacinta	09.14	(Graham 1982: 135)

jas – VER.TR.R: "to clear"

ti ja-sa=wa	*ti jas-aw-Ø*	2ANTIP	1.a.i	COL	Lnt. Retalteco	B1	Usumacinta	09.16	(Houston et al. 2006b: fig. 2)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	MTL	St. 1	A11	Central Peten	09.14	(Tokovinine and Zender 2012: fig. 2.2)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	PNG	P. 3	C''1	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)

ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	K3395	B'1	Central Peten	09.12	(Reents-Budet 1994: 272)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	T. 1 Lnt. 2	B3	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 69)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	T. 1 Lnt. 3	D4	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	T. 1 Lnt. 3	F10	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	St. 5	D10	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 8a)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	T. 4 Lnt. 3	H8a	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	Alt. 14	13	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 50b)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	St. 16	B3	Central Peten	09.14	(Jones and Satterthwaite 1982: fig. 22)
ja-sa	*jas-a[w]-Ø*	2ANTIP	1.g.i	TIK	MT 38:B	H1	Central Peten	09.15	(Moholy-Nagy 2008: fig. 189b)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 38:A	H1	Central Peten	09.15	(Trik 1963: fig. 3)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 43	A2	Central Peten	09.15	(Moholy-Nagy 2008: fig. 204h)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 44	A2	Central Peten	09.15	(Moholy-Nagy 2008: fig. 194f)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 51:A	D1	Central Peten	09.15	(Trik 1963: fig. 6)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 51:B	D1	Central Peten	09.15	(Trik 1963: fig. 7)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	TIK	MT 56	I1	Central Peten	09.15	(Moholy-Nagy 2008: fig. 97)
ja-sa=wa	*jas-aw-Ø*	2ANTIP	1.a.i	UAX	St. 12	B2	Central Peten	10.03	(Graham 1986: 161)
ti ja-sa=wa	*ti jas-aw-Ø*	2ANTIP	1.a.i	YAX	Lnt. 9	B1	Usumacinta	09.16	(Graham and von Euw 1977: 29)
ti ja-sa=wa	*ti jas-aw-Ø*	2ANTIP	1.a.i	YAX	Lnt. 33	E1	Usumacinta	09.16	(Graham 1979: 75)

jatz' – VER.TR.R: "to strike"

ja-tz'a=ja	*ja<h>tz'-aj-Ø*	1PASS	1.a.i	NAR	Alt. 2	B2	Central Peten	09.17	(Grube 2004c: fig. 13)
ja-tz'a	*ja<h>tz'-a[j]-Ø*	1PASS	1.g.i	NAR	Alt. 2	C4	Central Peten	09.17	(Grube 2004c: fig. 13)
ja-tz'a	*ja<h>tz'-a[j]-Ø*	1PASS	1.g.i	NAR	Alt. 2	F3	Central Peten	09.17	(Grube 2004c: fig. 13)
ja-tz'a=ja	*ja<h>tz'-aj-Ø*	1PASS	1.a.i	PAL	T17T	B6a	Tabasco	09.12	(González and Fernández Martínez 1994)
ja-tz'a=ja	*ja<h>tz'-aj-Ø*	1PASS	1.a.i	OXP	St. 7	B6	Central Campeche	10.00	(Grube 2008: fig. 8.31)
ja-tz'a=yi	*jatz'-ay-i-Ø*	2MED	1.a.ii	COL	St. Nil Sajal	A16	Usumacinta	09.16	(Mayer 1995: pl. 104)

jay – ADJ: "thin"

ja-ya=ja	*jay-aj-Ø*	1INCH	1.a.i	CPN	St. J	D3	Motagua	09.13	(Linda Schele SD 1016)

jel – VER.TR.R: "to change over, to adorn"

JEL-?=ja=ya	*je<h>l-[a]j-Ø=[i]y*	1PASS	4.a.i	CHN	St. 1	Q8	Yucatan	10.03	(Callaway 2011: fig. III.2)
JEL=ja	*je<h>l-[a]j-Ø*	1PASS	2.e.i	COB	St. 1	M18	Quintana Roo	09.12	(Graham and von Euw 1997: 22)
JEL=ji=ya	*je<h>l-j-Ø=iy*	1PASS	2.f.ii	PAL	TC	C6	Tabasco	09.12	(Robertson 1991: fig. 9)
JEL=ji=ya	*je<h>l-j-Ø=iy*	1PASS	2.f.ii	PAL	TS	D16	Tabasco	09.12	(Robertson 1991: fig. 95)
JEL-la=ja	*je<h>l-aj-Ø*	1PASS	1.b.i	QRG	St. C	B6a	Motagua	09.17	(Looper 2003: fig. 5.1)
JEL=ja	*je<h>l-[a]j-Ø*	1PASS	2.e.i	QRG	St. F	B16b	Motagua	09.16	(Looper 2003: fig. 4.6)
u=JEL-le	*u-jel-e-Ø*	2IND	1.g.i	C Ma.	21c	F1-G1	Yucatan	11.11	(Anders 1967: 21)
u=je-le=wa	*u-jel-e-Ø*	2IND	1.a.ii	PAL	TFC	E6	Tabasco	09.12	(Robertson 1991: fig. 153)
tu=JEL-le=ye	*t-u-jel-y-e[l]*	3NMLS	1.g.i	CPN	Alt. U	I3	Motagua	09.18	(Schele and Stuart 1986b: fig. 1)

joch' – VER.TR.R: "to drill"

jo-ch'o=K'AK'=AJ	*joch'-Ø+k'a[h]k'-aj-Ø*	1INCH	1.e.iv	PAL	T19B-S	E6	Tabasco	09.15	(Stuart 2005b: pl. 2)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38b	A1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38b	C1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38b	D1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38b	F1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38c	A1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38c	C1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38c	D1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	C Ma.	38c	F1	Yucatan	11.11	(Anders 1967: 38)
jo-ch'o=ji=ya	*jo<h>ch'-j-Ø=iy*	1PASS	2.f.ii	CHN	CC-HB	38	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
jo-ch'o=ji=ya	*jo<h>ch'-j-Ø=iy*	1PASS	2.f.ii	CHN	CC-HB	5	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
jo-ch'a	*jo<h>ch'-a[j]-Ø*	1PASS	1.g.i	ITN	St. 17	pA2a	Pasion	09.17	(Mayer 1995: pl. 15)
jo-ch'o=ja	*jo<h>ch'-[a]j-Ø*	1PASS	2.a.i	LTI	P. 2	A2	Usumacinta	09.16	(Mayer 1995: pl. 265)
jo-ch'o=ji=ya	*jo<h>ch'-j-Ø=iy*	1PASS	2.f.ii	PAL	UNKW	gly14	Tabasco	?	(Linda Schele SD 115)
jo-ch'o=ji=ya	*jo<h>ch'-j-Ø=iy*	1PASS	2.f.ii	YAX	Lnt. 29	D4	Usumacinta	09.16	(Graham 1979: 67)
jo-ch'o	*joch'-o[w]-Ø*	2ANTIP	1.g.i	C Dr.	5b	C1	Yucatan	11.04	(Anders and Deckert 1975: 5)
jo-ch'o	*joch'-o[w]-Ø*	2ANTIP	1.g.i	C Dr.	5b	E1	Yucatan	11.04	(Anders and Deckert 1975: 5)
jo-ch'o	*joch'-o[w]-Ø*	2ANTIP	1.g.i	C Dr.	6b	A1	Yucatan	11.04	(Anders and Deckert 1975: 6)
u=jo-ch'o=wa	*u-joch'-o-Ø*	2IND	1.a.ii	ITN	St. 17	H3a	Pasion	09.17	(Tokovinine and Zender 2012: fig. 2.10)

jol – VER.TR.R: "to open"

jo-lo=wo	*jol-ow-Ø*	2ANTIP	1.a.i	CML	U. 26 Pdt. 10	A7	Tabasco	09.17	(Marc Zender n.p.)
K'AK' 5-lo=wo CHAN[na]	*k'a[h]k'-Ø jol-ow-Ø chan*	2ANTIP	1.a.i	QRG	Str. 1B-1	D1-E1a	Motagua	09.19	(Schele and Looper 1996: fig. 186)
K'AK' 5-lo=wo CHAN[na]	*k'a[h]k'-Ø jol-ow-Ø chan*	2ANTIP	1.a.i	QRG	Str. 1B-1	Q1	Motagua	09.19	(Schele and Looper 1996: fig. 186)
jo-lo=wo	*jol-ow-Ø*	2ANTIP	1.a.i	UXM	BSc. 2	S1	Yucatan	10.03	(Graham 1992: 120)
K'AK' 5-lo=ya CHAN[na]	*k'a[h]k'-Ø jol-[o]y-Ø chan*	2MED	1.a.ii	QRG	St. K	C7	Motagua	09.18	(Looper 2001: fig. 10)

jom – VER.TR.R: "to destroy"

jo-mo=yi	*jom-oy-i-Ø*	2MED	1.a.ii	CPN	St. 11	Bp1	Motagua	09.19	(Schele 1989c: fig. 1)

joy – VER.TR.R: "to encircle"

JOY=ja ti AJAW	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	AGT	St. 1	B12	Pasion	09.15	(Graham 1967: fig. 3)
JOY=ji=ya ti AJAW=le	*jo<h>y-j-Ø=iy ti ajaw-le[l]*	1PASS	2.f.ii	AGT	St. 5	A9	Pasion	09.16	(Houston and Mathews 1985: fig. 19)
i JOY=ja ti	*jo<h>y-aj-Ø ti*	1PASS	2.e.i	ALC	St. 1	A6	Central Peten	09.06	(Grube 2008: fig. 8.18)
jo-JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	BPK	St. 2	C1	Usumacinta	09.17	(Mathews 1980: fig. 2)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	C Dr.	23b	A1	Yucatan	11.04	(Anders and Deckert 1975: 23)
JOY	*jo<h>y[-aj]-Ø*	1PASS	2.g.ii	C Dr.	23b	C1	Yucatan	11.04	(Anders and Deckert 1975: 23)
JOY	*jo<h>y[-aj]-Ø*	1PASS	2.g.ii	C Dr.	23b	D1	Yucatan	11.04	(Anders and Deckert 1975: 23)

JOY	*jo<h>y[-aj]-Ø*	1PASS	2.g.ii	C Dr.	23b	E1	Yucatan	11.04	(Anders and Deckert 1975: 23)
JOY	*jo<h>y[-aj]-Ø*	1PASS	2.g.ii	C Dr.	23b	F1	Yucatan	11.04	(Anders and Deckert 1975: 23)
JOY	*jo<h>y[-aj]-Ø*	1PASS	2.g.ii	C Dr.	23b	G1	Yucatan	11.04	(Anders and Deckert 1975: 23)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	C Dr.	60a	E1	Yucatan	11.04	(Anders and Deckert 1975: 60)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	C Dr.	67a	E1	Yucatan	11.04	(Anders and Deckert 1975: 67)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	CAY	Lnt. 1	E4	Usumacinta	09.17	(John Montgomery n.p.)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	CAY	Lnt. 1	K15	Usumacinta	09.17	(John Montgomery n.p.)
JOY=ji=ya	*jo<h>y-j-Ø=iy*	1PASS	2.f.ii	CHP	St. 1	B9	Central Peten	09.09	(Grube 2008: fig. 8.12)
JOY=ja=ji=ya	*jo<h>y-[a]j-Ø=[i]j=iy*	1PASS	2.e.i	CLK	St. 33	F3	Central Campeche	09.11	(Simon Martin n.p.)
JOY=ja=ji=ya	*jo<h>y-[a]j-Ø=[i]j=iy*	1PASS	2.e.i	CLK	St. 33	G2	Central Campeche	09.11	(Simon Martin n.p.)
JOY=ja ti AJAW	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	CLK	Frg. 37	B1	Central Campeche	09.16	(Simon Martin n.p.)
ti JOY=ja	*ti jo<h>y-[a]j-Ø*	1PASS	2.e.i	COL	K3026	E1	?	?	(Kerr 1992: 380)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	COL	K6316	B1	?	?	(Kerr and Kerr 2000: 959)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	COL	P. DOAKS 1	H2a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	COL	P. DOAKS 1	J4a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	COL	P. New Orleans	C1a	Usumacinta	09.18	(Mayer 1995: pl. 99)
^{jo}JOY=ji=ji=ya	*jo<h>y-[a]j-Ø=ij=iy*	1PASS	2.e.ii	CPN	Alt. F'	B3a	Motagua	09.18	(MacLeod 1989: fig. 1)
JOY AJAW=le	*jo<h>y[-aj]-Ø [ti] ajaw-le[l]*	1PASS	4.a.ii	CPN	T. 11 NDEP	D2	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 1)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	CRN	P. 2	A2	Central Peten	09.12	(Mayer 1987: pl. 26)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	DPL	P. 7	B2b	Pasion	09.12	(Houston 1993: fig. 5.11)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	DPL	St. 8	H18b	Pasion	09.14	(Houston 1993: fig. 4.14)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	LTI	P. 3	D1	Usumacinta	09.17	(Stefanie Teufel n.p.)
ti JOY=ja	*ti jo<h>y-[a]j-Ø*	1PASS	2.e.i	MTL	K1463	D1	Central Peten	09.15	(Kerr 1989: 89)
^{jo}JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	MTL	St. 1	A8	Central Peten	09.14	(Tokovinine and Zender 2012: fig. 2.2)
JOY=ja ti AJAW=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	NAR	St. 6	A3	Central Peten	09.17	(Graham and von Euw 1975: 23)
JOY=ja ti AJAW	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	NAR	St. 20	A4	Central Peten	09.15	(Graham and von Euw 1975: 51)
u=AJAW=JOY=ja=le	*u-ajaw-jo<h>y-[a]j-[e]l-Ø*	1PASS	2.e.i	NAR	St. 32	S3	Central Peten	09.19	(Graham 1978: 86)
^{jo}JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	PAC	St. 6	D1	Mopan-Pusilha	09.02	(Helmke et al. 2006: fig. 6)
JOY=ji=ya	*jo<h>y-j-Ø=iy*	1PASS	2.f.ii	PMT	Mon. 6	A2	Tabasco	09.13	(Bíró 2011a: fig. 59)
JOY=ja ti AJAW=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	PNG	Alt. 2	E2	Usumacinta	09.16	(Teufel 2004: 540)
^{jo}JOY=ji=ya	*jo<h>y-j-Ø=iy*	1PASS	2.f.ii	PNG	P. 2	X9	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)
JOY=ji=ya	*jo<h>y-j-Ø=iy*	1PASS	2.f.ii	PNG	P. 3	A'1	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
JOY=ja ti AJAW	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	PNG	P. 15	C7	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	PNG	St. 8	E3	Usumacinta	09.14	(Stuart and Graham 2003: 44)
JOY=ja ti AJAW^{wa}	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	PNG	St. 11	C7	Usumacinta	09.15	(Stuart and Graham 2003: 59)
^{jo}JOY=aj ti AJAW	*jo<h>y-[a]j-Ø ti ajaw*	1PASS	2.e.i	PNG	St. 14	B11	Usumacinta	09.16	(Teufel 2004: 386)
JOY=ja ti AJAW^{wa}=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	PNG	St. 15	B1a	Usumacinta	09.17	(Teufel 2004: 390)
JOY=ja ti AJAW=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	PNG	St. 16	C5	Usumacinta	09.16	(Teufel 2004: 393)
JOY=ja ti AJAW=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	PNG	St. 23	D17	Usumacinta	09.17	(Teufel 2004: 411)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	PNG	Trn. 1	G'3	Usumacinta	09.17	(Teufel 2004: 549)
JOY=ji=ya ti	*jo<h>y-j-Ø=iy*	1PASS	2.f.ii	RSB	HS. 1	16b	Quintana Roo	09.04	(Carrasco and Boucher 1987: fig. 3)
^{jo}JOY=ya ti AJAW=le	*jo<h>y-a[j]-Ø ti ajaw-le[l]*	1PASS	1.g.i	SBL	St. 7	A2a	Pasion	10.00	(Graham 1996: 25)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	TAM	HS. 2 I	C1	Pasion	09.16	(Gronemeyer 2013: pl. 31)

JOY=ja ti	*jo<h>y-aj-Ø ti*	1PASS	2.e.i	TIK	Marcador	E2	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
JOY=ja ti	*jo<h>y-aj-Ø ti*	1PASS	2.e.i	TIK	St. 4	A5	Central Peten	08.18	(Jones and Satterthwaite 1982: fig. 4)
^{jo}JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	TNA	Frg. 34a	pB3	Chiapas	09.10	(Ian Graham n.p.)
i JOY=ja	*jo<h>y-aj-Ø*	1PASS	2.e.i	TNA	Frg. P14	pB1	Chiapas	?	(Sven Gronemeyer 39-000009)
JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	YAX	HS. 4	C7	Usumacinta	09.16	(Graham 1982: 176)
JOY=ja ti AJAW=le	*jo<h>y-[a]j-Ø ti ajaw-le[l]*	1PASS	2.e.i	YAX	Lnt. 30	H5	Usumacinta	09.16	(Graham 1979: 69)
^{jo}JOY=ja	*jo<h>y-[a]j-Ø*	1PASS	2.e.i	YAX	St. 11	K4	Usumacinta	09.16	(Tate 1992: fig. 136)
u=JOY=wa	*u-joy-o-Ø*	2IND	2.e.ii	COL	JM Plaque 4442	A5	?	08.11	(Mora-Marín 2001: fig. A1.15)
u=AJAW=JOY=ja=le	*u-ajaw-jo<h>y-[a]j-[e]l-Ø*	3NMLS	3.a.i	NAR	St. 32	S3	Central Peten	09.19	(Graham 1978: 86)
ti ^{jo}JOY-ye=la	*ti jo<h>y-el*	3NMLS	1.b.ii	YAX	Lnt. 26	T1	Usumacinta	09.14	(Graham and von Euw 1977: 57)

jub – VER.TR.R: "to bring down"

ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	AGT	St. 19	A11a	Pasion	09.17	(Houston 2014: fig. 12.8)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	BPK	Lnt. 4	A3	Usumacinta	09.16	(Arellano Hernández 1998: fig. 13)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	CRC	St. 3	D17a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	CRC	St. 3	D19a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	CRC	St. 22	G12	Mopan-Pusilha	09.10	(Grube 1994a: fig. 9.3)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	CRC	Str. B16 Stucco	p3	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	CRC	Str. B16 Stucco	p12	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	DPL	HS. 2 W III	B2b	Pasion	09.12	(Fahsen 2002: fig. 8)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	DPL	HS. 4 IV	F1	Pasion	09.12	(Houston 1993: fig. 4.11)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	DPL	HS. 4 V	E1	Pasion	09.12	(Houston 1993: fig. 4.11)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	ITN	St. 17	H10	Pasion	09.17	(Tokovinine and Zender 2012: fig. 2.10)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	MRL	St. 4	G3a	Tabasco	09.13	(César Lizardi Ramos n.p.)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	NAR	St. 22	F13	Central Peten	09.13	(Graham and von Euw 1975: 56)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	NAR	St. 22	H1	Central Peten	09.13	(Graham and von Euw 1975: 56)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	PUS	St. D	D13	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	TAM	HS. 2 III	O1	Pasion	09.16	(Gronemeyer 2013: pl. 31)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	TIK	MT 39:A	A3	Central Peten	09.15	(Moholy-Nagy 2008: fig. 200b)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	TIK	MT 39:B	A3	Central Peten	09.15	(Trik 1963: fig. 9)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	TIK	T. 1 Lnt. 3	A4	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)
ju-bu=yi	*jub-uy-i-Ø*	2MED	1.a.ii	YAX	HS. 4 III	D2	Usumacinta	09.16	(Graham 1982: 176)
u=ju-bu=li	*u-jub-ul-Ø*	3NMLS	1.a.ii	QRG	Alt. P'	N1a	Motagua	09.18	(Jones 1983)
u=ju-bu=li	*u-jub-ul-Ø*	3NMLS	1.a.ii	QRG	Alt. P'	M2a	Motagua	09.18	(Jones 1983)

juk – VER.TR.R: "to scrape"

ju-ku=bi	*juk-ub*	3INSTR	1.a.ii	CML	U. 26 Sp. 11	A3	Tabasco	09.17	(Marc Zender n.p.)
ju-ku=bi	*juk-ub*	3INSTR	1.a.ii	PNG	P. 2	Y3	Usumacinta	09.11	(Schele and Miller 1986: pl. 40a)

jul – VER.TR.R: "to spear"

JUL^{lu}=ja	*ju<h>l-[a]j-Ø*	1PASS	2.a.i	COL	K595	P1	?	?	(Coe 1978: #12)
u=JUL-lu=wa	*u-jul-u-Ø*	2IND	1.a.ii	COL	Shl.		?	?	(Boot 2009b: 87)

jus – VER.TR.R: "to plaster"

ju-su=wa	*jus-uw-Ø*	2ANTIP	1.a.ii	AGT	St. 1	A8a	Pasion	09.15	(Graham 1967: fig. 3)

jut – VER.TR.R: "to ruin, to demolish"

ju-tu=wi	*jut-uw-Ø*	2ANTIP	1.a.ii	EKB	M. 96G	H1	Yucatan	09.16	(Lacadena 2002: fig. 18a)
ju-tu=wi	*jut-uw-Ø*	2ANTIP	1.a.ii	EKB	M. C	K1	Yucatan	09.19	(Lacadena 2002: fig. 20b)

jutz' – VER.TR.R: "to wash"

ju-tz'o=ni	*jutz'-on-Ø*	n/a	n/a	PUS	St. H	E13	Mopan-Pusilha	09.11	(Prager 2002a, III: fig. 10)

kab – NOUN: "earth"

ka-ba=ji	*kab-aj*	1ABSL	1.a.ii	CRC	St. 17	B2	Mopan-Pusilha	10.01	(Martin and Grube 2000: 99)
KAB K'UH	*kab[-al] k'uh*	1ATTR	2.g.ii	COL	Yax Wayib	A6-B6	Central Peten	09.00	(Houston and Inomata 2009: fig. 2.3)
KAB=la K'UH	*kab-[a]l k'uh*	1ATTR	2.e.i	COL	God D Vessel	M9	?	?	(Boot 2008: fig. 4)
ka-ba=la pi-tzi=la	*kab-al pitz-il*	1ATTR	1.a.i	COL	K7749	I1-J1	?	?	(Kerr and Kerr 2000: 1006)
KAB=la K'UH	*kab-[a]l k'uh*	1ATTR	2.e.i	CPN	St. 2	D8b	Motagua	09.11	(Maudslay 1974, I: pl. 102)
KAB=la K'UH	*kab-[a]l k'uh*	1ATTR	2.e.i	CPN	St. B	A12	Motagua	09.15	(Barbara Fash n.p.)
6=KAB=la	*6 kab-[a]l*	1ATTR	2.e.i	NAR	St. 21	A13	Central Peten	09.13	(Graham and von Euw 1975: 53)
6=KAB=la	*6 kab-[a]l*	1ATTR	2.e.i	NAR	St. 27	Ap3a	Central Peten	09.13	(Graham 1978: 73)
KAB=la	*kab-[a]l*	1ATTR	2.e.i	NAR	K2796	Q2	Central Peten	?	(Coe 1973: #49)
KAB=la	*kab-[a]l*	1ATTR	2.e.i	NAR	K7750	A'2	Central Peten	09.17	(Grube 1998b)
KAB=la i-ka-tzi	*kab-[a]l ikatz*	1ATTR	2.e.i	PAL	TI-M	B7-A8	Tabasco	09.12	(Robertson 1983b: fig. 96)
KAB=la K'UH	*kab-[a]l k'uh*	1ATTR	2.e.i	PAL	TI-W	I11	Tabasco	09.12	(Robertson 1983b: fig. 97)
KAB K'UH	*kab[-al] k'uh*	1ATTR	2.g.ii	QRG	Mon. 26	Cp2	Motagua	09.02	(Looper 2003: fig. 1.7)
KAB K'UH	*kab[-al] k'uh*	1ATTR	2.g.ii	TIK	St. 31	B14	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
KAB K'UH	*kab[-al] k'uh*	1ATTR	2.g.ii	TIK	St. 31	E26	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)

kab-a – VER.TR.D: "to oversee"

ha-i ka-KAB=wi=?	*ha[']i[']-Ø kab-[a]w-Ø-?*	2ANTIP	2.e.ii	QRG	Alt. P'	Q1	Motagua	09.18	(Jones 1983)
u=KAB-ba	*u-kab-a-Ø*	2IND	1.g.i	C Dr.	44b	B2	Yucatan	11.04	(Anders and Deckert 1975: 44)
u=KAB-ba	*u-kab-a-Ø*	2IND	1.g.i	C Dr.	53a	E1	Yucatan	11.04	(Anders and Deckert 1975: 53)
u=KAB-ba	*u-kab-a-Ø*	2IND	1.g.i	C Dr.	54b	F1	Yucatan	11.04	(Anders and Deckert 1975: 54)

u=KAB=wa	*u-kab[-a]-Ø*	2IND	2.e.i	NMP	St. 2	G4	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
u=KAB=wa	*u-kab[-a]-Ø*	2IND	2.e.i	QRG	Alt. O'	I'4a	Motagua	09.18	(Jones 1983)
u=KAB=wa	*u-kab[-a]-Ø*	2IND	2.e.i	QRG	Alt. O'	L'1b	Motagua	09.18	(Jones 1983)
u=ka-ba=wa	*u-kab-a-Ø*	2IND	1.a.i	QRG	Alt. O'	J'6b	Motagua	09.18	(Jones 1983)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	ALC	St. 1	D7	Central Peten	09.06	(Grube 2008: fig. 8.18)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	ALH	Jd. 1	A3	Hondo	09.07	(Mathews and Pendergast 1979: fig. 2)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	BLK	St. 5	D6	Central Peten	08.18	(Grube 2008: fig. 8.6)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	BPK	Lnt. 4	D1	Usumacinta	09.16	(Arellano Hernández 1998: fig. 13)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	BPK	Lnt. 3	A8	Usumacinta	09.15	(Mathews 1980: fig. 7)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	BPK	R. 2-15	D2	Usumacinta	09.17	(Miller and Houston 1998: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	BPK	ScS. 5	L3	Usumacinta	09.16	(Alexandre Safronov n.p.)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	BPK	ScS. 5	F1	Usumacinta	09.16	(Alexandre Safronov n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Dr.	52b	B2	Yucatan	11.04	(Anders and Deckert 1975: 52)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Dr.	53b	C4	Yucatan	11.04	(Anders and Deckert 1975: 53)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Dr.	54b	E2	Yucatan	11.04	(Anders and Deckert 1975: 54)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Dr.	56b	B1	Yucatan	11.04	(Anders and Deckert 1975: 56)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Dr.	60a	A3a	Yucatan	11.04	(Anders and Deckert 1975: 60)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Pa.	7c	C2	Yucatan	10.18	(Anders 1968: 7)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Pa.	8c	C2	Yucatan	10.18	(Anders 1968: 8)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	C Pa.	8c	F3	Yucatan	10.18	(Anders 1968: 8)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	C Pa.	4c	F1	Yucatan	10.18	(Anders 1968: 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	C Pa.	6c	F2	Yucatan	10.18	(Anders 1968: 6)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	C Pa.	24a	Ep2	Yucatan	10.18	(Anders 1968: 24)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CAY	Lnt. 1	G2	Usumacinta	09.17	(John Montgomery n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CNC	P. 1	D7	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CNC	P. 1	J4	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CNC	P. 1	P8	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CNC	BcM. 2	A3	Southern Peten	09.18	(Ramzy Barrois n.p.)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COB	St. 20	C7	Quintana Roo	09.17	(Graham and von Euw 1997: 60)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	COL	Yax Wayib	C2	Central Peten	09.00	(Houston and Inomata 2009: fig. 2.3)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	COL	Yax Wayib	D6	Central Peten	09.00	(Houston and Inomata 2009: fig. 2.3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	COL	St. New York	D3	?	09.16	(Mayer 1995: pl. 153)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	COL	Bx. Tabasco	pT1	Tabasco	09.11	(Anaya, Guenter and Mathews 2001)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	COL	P. Caracas	C11	Usumacinta	09.16	(Bíró 2005: fig. 9)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	COL	P. Cleveland	D4a	Usumacinta	09.18	(Mayer 1995: pl. 94)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	COL	St. Nil Sajal	A19	Usumacinta	09.16	(Mayer 1995: pl. 104)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	K1606	D1	?	09.13	(Kerr 1989: 101)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	P. DOAKS	H3a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	P. Denver	A2	Usumacinta	09.13	(Bíró 2005: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	P. Brussels	B1	Usumacinta	09.13	(Bíró 2005: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	P. Bowers	B3a	Central Peten	09.14	(Christian Prager n.p.)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	COL	K1457	I4	Central Peten	09.10	(Robicsek and Hales 1982: #130)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CPN	Alt. A'	G1b	Motagua	09.06	(Schele 1990b: fig. 21)

u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CPN	St. J	W 6b	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CPN	Str. 10L-16 1st	a7	Motagua	09.16	(Stuart 2008a: 34)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CPN	St. 2	D7b	Motagua	09.11	(Maudslay 1974, I: pl. 102)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	Alt. Q	E3	Motagua	09.17	(Schele 1989a: fig. 1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	Jd. Comayagua	A5	Tabasco	09.17	(Mayer 1997: fig. 19)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	Alt. G	B3	Motagua	09.17	(Schele 1987g: fig. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. 49	Cp3	Motagua	09.05	(Riese and Baudez 1983: fig. R-11)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. 60	Ap1	Motagua	09.02	(Schele 1990b: fig. 16a)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. P	A8a	Motagua	09.09	(Schele and Stuart 1986a: fig. 3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	Mon. 10	Ep2a	Motagua	09.15	(Schele 1987e: fig. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. 6	C2	Motagua	09.12	(McCready et al. 1988: fig. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. 7	A9a	Motagua	09.09	(Schele and Stuart 1986a: fig. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CPN	HS. 1 XXIII	I1a	Motagua	09.16	(Barbara Fash n.p.)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CPN	St. I	C2a	Motagua	09.12	(Schele 1987f: fig. 2)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CPN	St. I	D4b	Motagua	09.12	(Schele 1987f: fig. 2)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	Alt. 21	L4	Mopan-Pusilha	09.10	(Houston 1991)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	Alt. 21	P2b	Mopan-Pusilha	09.10	(Houston 1991)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	BCm. 3	C5	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 3)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	St. 3	A20b	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	St. 3	C5a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	CRC	St. 22	H12	Mopan-Pusilha	09.10	(Grube 1994a: fig. 9.3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRC	Alt. 12	9	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRC	Alt. 23	E3	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRC	BCm. 3	A3	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRC	St. 3	C18a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRC	St. 3	C20b	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	Alt. 21	R3	Mopan-Pusilha	09.10	(Houston 1991)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	St. 3	C9a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	St. 4	pC2	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 4b)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	C17P	23-32	Mopan-Pusilha	09.18	<<Grube, 1994 #714: fig. 9.16l >
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	Str. B16 Stucco	p6	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	Str. B16 Stucco	p45	Mopan-Pusilha	09.12	(Grube 2004c: fig. 4)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	CRC	Str. L3 2nd Cst.	B2	Mopan-Pusilha	09.09	(Chase and Chase 1987: fig. 37)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	Alt. 2	P2	Central Peten	09.17	(Canuto et al. 2008: fig. 2.13)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	St. 1	pD7a	Central Peten	09.13	(Canuto et al. 2008: fig. 2.13)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	HS. 3 I	B3	Central Peten	09.13	(Martin and Stuart 2009: 24)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	HS. 3 II	B3a	Central Peten	09.13	(Martin and Stuart 2009: 25)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	P. 1	E6	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	P. 1	Q4	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	P. 1	T5a	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	HS. 2 1-X	A4	Central Peten	09.12	(David Stuart n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	HS. 2 XIV	C3	Central Peten	09.12	(David Stuart n.p.)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRN	Msc. 06-2011/PH	B2a	Central Peten	09.12	(Boot 2011: fig. 1)

u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	CRO	St. 1	B2	Pasion	09.13	(Mayer 1991: pl. 144)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 1 II	K3	Pasion	09.16	(Houston 1993: fig. 4.16)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 2 E V	D2	Pasion	09.12	(Fahsen 2002: fig. 7)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 2 E IV	C2a	Pasion	09.12	(Fahsen 2002: fig. 7)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 2 W VI	C2	Pasion	09.12	(Fahsen 2002: fig. 8)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 2 W V	E1b	Pasion	09.12	(Fahsen 2002: fig. 8)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 2 W III	F1a	Pasion	09.12	(Fahsen 2002: fig. 8)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 4 III	D1	Pasion	09.12	(Houston 1993: fig. 4.11)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 4 III	G2	Pasion	09.12	(Houston 1993: fig. 4.11)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 4 IV	H2	Pasion	09.12	(Houston 1993: fig. 4.11)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	HS. 4 V	G2	Pasion	09.12	(Houston 1993: fig. 4.11)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	St. 14	M1	Pasion	09.14	(Houston 1993: fig. 3.24)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	DPL	St. 16	D3a	Pasion	09.15	(Graham 1967: fig. 6)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	DPL	St. 14	H4	Pasion	09.14	(Houston 1993: fig. 3.24)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	EDZ	St. 22	D1	Yucatan	09.11	(Graña-Behrens 2002: pl. 66)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	EDZ	St. 21	D1	Yucatan	09.11	(Graña-Behrens 2002: pl. 65)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	EKB	M. 96G	W3	Yucatan	09.16	(Lacadena 2002: fig. 18d)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	IKL	Lnt. 2	A1	Yucatan	?	(Bíró 2003: fig. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	ITN	St. 17	pB5b	Pasion	09.17	(Mayer 1995: pl. 15)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	IXK	St. 2	B12	Mopan-Pusilha	09.17	(Graham 1980: 141)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	IXK	St. 2	C6	Mopan-Pusilha	09.17	(Graham 1980: 141)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	JAI	St. 1	A9	Yucatan	09.11	(Graña-Behrens 2002: pl. 84)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	JOY	St. 1	B5	Western Peten	09.02	(Arnauld 2002: fig. 5)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	LMN	St. 9	C1	Hondo	09.09	(Reents-Budet 1988: fig. 1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	LTI	P. 1	A3	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	LTI	P. 2	A3	Usumacinta	09.16	(Mayer 1995: pl. 265)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	MTL	K1004	V1	Central Peten	?	(Robicsek and Hales 1982: #186)
u=KAB	*u-kab[-aj]-Ø*	4TEMP	2.g.ii	NAR	Alt. 1	I2	Central Peten	09.08	(Graham 1980: 104)
u=KAB=AJ	*u-kab-aj-Ø*	4TEMP	1.e.iv	NAR	Alt. 2	B4	Central Peten	09.17	(Grube 2004c: fig. 13)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	Alt. 1	D1	Central Peten	09.08	(Graham 1980: 104)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	Alt. 1	G1	Central Peten	09.08	(Graham 1980: 104)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	HS. 1 VI	M2b	Mopan-Pusilha	09.10	(Graham 1980: 109)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	Alt. 1	D6a	Central Peten	09.08	(Graham 1980: 104)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	St. 23	G11	Central Peten	09.14	(Graham and von Euw 1975: 60)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NAR	St. 25	A9	Central Peten	09.09	(Graham 1978: 70)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	NAR	St. 18	H10	Central Peten	09.14	(Graham and von Euw 1975: 47)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	NAR	St. 23	F14	Central Peten	09.14	(Graham and von Euw 1975: 60)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	NAR	St. 35	E2	Central Peten	09.18	(Graham 1978: 92)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	NAR	HS. 1 II	C2a	Mopan-Pusilha	09.10	(Graham 1978: 108)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	NAR	St. 22	G16	Central Peten	09.13	(Graham and von Euw 1975: 56)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	NAR	St. 35	D5	Central Peten	09.18	(Graham 1978: 92)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	NAY	St. 1	B2a	Central Peten	09.14	(Mayer 2000: fig. 3)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	NSY	St. 1	C3	Yucatan	09.12	(Mayer 1995: pl. 111)

u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	NTN	Dwg. 82	D1	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.29)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAC	St. 6	D2	Mopan-Pusilha	09.02	(Helmke et al. 2006: fig. 6)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	HS. 1	C2a	Tabasco	09.11	(Mayer 1995: pl. 36)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	T4P2	pD1	Tabasco	09.11	(Robertson 1991: pl. 216)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	TI-E	M10	Tabasco	09.12	(Robertson 1983b: fig. 95)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	HDPF	A2	Tabasco	09.13	(Robertson 1985b: fig. 222)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	T4P2	pA1	Tabasco	09.11	(Robertson 1991: fig. 215)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PAL	OLVI	C3	Tabasco	09.10	(Robertson 1991: fig. 254)
u=KAB=ji=ji=ya	*u-kab-[a]j-Ø=ij=iy*	4TEMP	2.f.ii	PAL	T21B-P	H7	Tabasco	09.15	(Stuart 2006b: 187)
u=KAB=ji=ji=ya	*u-kab-[a]j-Ø=ij=iy*	4TEMP	2.f.ii	PAL	UNKW	gly04	Tabasco	?	(Linda Schele SD 114)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T14T	A3	Tabasco	09.13	(Schele and Miller 1986: fig. VII.2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T18S	354d	Tabasco	09.14	(Schele and Mathews 1979: no. 396)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T14T	G3a	Tabasco	09.13	(Schele and Miller 1986: fig. VII.2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T19B-S	D6	Tabasco	09.15	(Stuart 2005b: pl. 2)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T18S	172	Tabasco	09.14	(Schele and Mathews 1979: no. 504)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	T18S	264b	Tabasco	09.14	(Schele and Mathews 1979: no. 544)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	NORT	286	Tabasco	09.14	(Schele and Mathews 1979: no. 585)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	P. DOAKS 2	D1	Tabasco	09.14	(Coe and Benson 1966: fig. 8)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	96G	A3	Tabasco	09.17	(Robertson 1991: fig. 265)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	96G	H6b	Tabasco	09.17	(Robertson 1991: fig. 265)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	TISL	11a	Tabasco	09.12	(Robertson 1983b: fig. 170)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	SLAV	D3b	Tabasco	09.14	(Robertson 1991: fig. 229)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	SLAV	F3b	Tabasco	09.14	(Robertson 1991: fig. 229)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	K'TOK	pC6a	Tabasco	09.16	(Bernal Romero 2002: fig. 10)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	K'TOK	pE7a	Tabasco	09.16	(Bernal Romero 2002: fig. 13)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	K'TOK	pH8a	Tabasco	09.16	(Bernal Romero 2002: fig. 15)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	K'TOK	pJ4a	Tabasco	09.16	(Bernal Romero 2002: fig. 16)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	K'TOK	pI11	Tabasco	09.16	(Bernal Romero 2002: fig. 18)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	PMI1	A8	Tabasco	09.13	(Linda Schele SD 112)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	PMI1	C6a	Tabasco	09.13	(Linda Schele SD 110)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	PMI1	D8a	Tabasco	09.13	(Linda Schele SD 111)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PAL	PMI1	F1a	Tabasco	09.13	(Linda Schele SD 112)
u=KAB=ji=ya tu TAJ	*u-kab-j-Ø=iy t-u-taj*	4TEMP	2.f.ii	PAL	T18S	265	Tabasco	09.14	(Schele and Mathews 1979: no. 511)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PMT	P. 4	pB2	Tabasco	09.13	(Grube, Martin and Zender 2002: 10)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PMT	P. 96G	A3	Tabasco	09.13	(Stuart 2007c: 64)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PMT	P. 96G	D1	Tabasco	09.13	(Stuart 2007c: 64)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 3	V10	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 3	Y3	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 3	A'3	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 15	H2	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 15	Q12	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. 15	S10	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	St. 8	B20a	Usumacinta	09.14	(Stuart and Graham 2003: 46)

u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	St. 8	B'17	Usumacinta	09.14	(Stuart and Graham 2003: 48)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	Trn. 1	A'4-B'4	Usumacinta	09.17	(Teufel 2004: 549)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. US Collection	B4	Usumacinta	09.12	(Mayer 1989: pl. 103)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	Shl. J-5	F2	Usumacinta	09.14	(Stuart 1985b: fig. 1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	Shl. J-5	L3a	Usumacinta	09.14	(Stuart 1985b: fig. 1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PNG	P. DOAKS 1	I6a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	PNG	Msc. 1	H1b	Usumacinta	09.10	(Teufel 2004: 557)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	PNG	St. 8	Y1	Usumacinta	09.14	(Stuart and Graham 2003: 44)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	PNG	St. 37	D9	Usumacinta	09.12	(Teufel 2004: 454)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PRU	St. 27	E6	Central Peten	09.15	(Guenter 2004: fig. 9)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PRU	St. 31	Bp10	Central Peten	09.14	(Ian Graham n.p.)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PUS	St. D	G13	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	PUS	St. D	F13	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PUS	St. D	E6	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	PUS	St. P	E8	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 17)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	PUS	St. D	B13	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=ba=ji=ya	*u-[ka]b-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. I	D4b	Motagua	09.18	(Looper 2001: fig. 6)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	QRG	St. U	A8a	Motagua	09.02	(Looper 2003: fig. 1.5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. A	C4	Motagua	09.17	(Looper 2003: fig. 5.16)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. C	A15	Motagua	09.17	(Looper 2003: fig. 5.1)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. E	D11	Motagua	09.17	(Looper 2003: fig. 4.38)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. E	A9a	Motagua	09.17	(Looper 2003: fig. 4.41)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. E	C18a	Motagua	09.17	(Looper 2003: fig. 4.38)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. E	B15	Motagua	09.17	(Looper 2003: fig. 4.41)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. F	A13b	Motagua	09.16	(Looper 2003: fig. 4.6)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	St. F	D18b	Motagua	09.16	(Looper 2003: fig. 4.5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	Alt. P'	N2a	Motagua	09.18	(Jones 1983)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	Zoo. G	L'4a	Motagua	09.17	(Looper 2001: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	Zoo. P	2-A1b	Motagua	09.18	(Looper 2001: fig. 29)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	QRG	Zoo. P	8-A1	Motagua	09.18	(Looper 2001: fig. 30)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	QRG	St. E	D16a	Motagua	09.17	(Looper 2003: fig. 4.38)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	QRG	Zoo. P	5-A2	Motagua	09.18	(Looper 2001: fig. 29)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	REI	HS. 1 C	pC2a	Western Peten	09.13	(Stuart 2012a: fig. 7)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	REJ	St. 1	E6	Mopan-Pusilha	09.10	(Grube and Martin 2004: 37)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	RSB	HS. 1	7	Quintana Roo	09.04	(Carrasco and Boucher 1987: fig. 3)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	SBL	Str. A-14 T6	E'1	Pasion	09.16	(Graham 1990: fig. 1)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	SBL	St. 11	C1b	Pasion	10.00	(Graham 1996: 34)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TAM	St. 2	D5	Pasion	09.06	(Gronemeyer 2013: pl. 5)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TAM	St. 4	Cp9	Pasion	09.06	(Gronemeyer 2013: pl. 11)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	TCB	St. 1	Dp10b	Usumacinta	09.04	(Simon Martin n.p.)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	Marcador	H2	Central Peten	08.19	(Schele and Freidel 1990: : fig. 4.12)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 12	C4	Central Peten	09.04	(Jones and Satterthwaite 1982: fig. 18b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	A19	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)

u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	B26	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	C8	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	D12	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	F13	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	E19	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TIK	St. 31	H16	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TIK	Alt. 5	19	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 23)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TIK	MT 39:A	A7	Central Peten	09.15	(Moholy-Nagy 2008: fig. 200b)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TIK	MT 39:B	A7	Central Peten	09.15	(Trik 1963: fig. 9)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TIK	Hombre	D8	Central Peten	08.18	(Fahsen 1988: fig. 4)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TIK	T. 4 Lnt. 3	C2	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 73)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	TIK	MT 30	A7	Central Peten	09.15	(Moholy-Nagy 2008: fig. 198b)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TNA	Mon. 114	M1	Chiapas	09.18	(Graham and Mathews 1999: 148)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TNA	Mon. 159	B5	Chiapas	09.18	(Graham and Henderson 2006: 94)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TNA	Mon. 150	B4	Chiapas	09.07	(Graham and Henderson 2006: 84)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TNA	Mon. 176	Ap2	Chiapas	09.16	(Graham and Henderson 2006: 121)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	TRT	Mon. 8	B67	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	TZB	Mon. 16	B2b	Quintana Roo	09.07	(Nalda 2004: 49)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	UAX	St. 26	A8	Central Peten	09.00	n/a
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	YAX	Lnt. 10	E4a	Usumacinta	09.18	(Graham and von Euw 1977: 31)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	YAX	St. 11	E2	Usumacinta	09.16	(Tate 1992: fig. 136)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	YAX	St. 35	D3	Usumacinta	09.15	(Karen Bassie n.p.)
u=KAB=ya	*u-kab-[j]-Ø=[i]y*	4TEMP	2.g.ii	YAX	Lnt. 39	A3	Usumacinta	09.16	(Graham 1979: 87)
u=KAB=ji=ya	*u-kab-j-Ø=iy*	4TEMP	2.f.ii	YXH	St. 31	C1	Central Peten	09.18	(Grube 2000c: fig. 206)
u=KAB=ji	*u-kab-[a]j-Ø*	4TEMP	2.e.ii	ZAP	St. 5	C8	Central Peten	08.19	(Schele, Fahsen and Grube 1992: fig. 7)

kach – VER.TR.R: “to collect, to bundle up”

ka-cha=ji	*ka<h>ch-aj-Ø*	1PASS	1.a.ii	AGT	St. 1	A7a	Pasion	09.15	(Graham 1967: fig. 3)

kakaw – NOUN: “cacao”

ka-wa=la	*ka[ka]w-al*	1ATTR	1.a.i	COL	K2777	G1	Central Peten	?	(Schele and Miller 1986: pl. 73a)

kal – VER.TR.R: “to split”

K'AK' u=KAL=wa	*k'a[h]k'-Ø u-kal[-a]-Ø*	2IND	2.e.i	NAR	Mace Head	C4	Central Peten	09.17	(Grube 2004c: fig. 10)
K'AK' u=KAL=wa	*k'a[h]k'-Ø u-kal[-a]-Ø*	2IND	2.e.i	NAR	Mace Head	D5	Central Peten	09.17	(Grube 2004c: fig. 10)
KAL=wi TE'	*kal-[a]w-Ø te'*	2ANTIP	2.e.ii	CUY	Vessel	R3	Mopan-Pusilha	09.18	(Helmke et al. 2012: fig. 7)
KAL=wi TE'	*kal-[a]w-Ø te'*	2ANTIP	2.e.ii	CUY	Vessel	S3	Mopan-Pusilha	09.18	(Helmke et al. 2012: fig. 7)
KAL=wi TE'	*kal-[a]w-Ø te'*	2ANTIP	2.e.ii	CUY	Vessel	T3	Mopan-Pusilha	09.18	(Helmke et al. 2012: fig. 7)

kam – VER.INTR

ti ka-ma=bi	*ti kam-ab*	3INSTR	1.a.ii	TIK	MT. 11	pB1	Central Peten	09.04	n/a

kin – VER.TR

IX ki-nu=wi ma-ta	*ix kin-[i]w-0 mat*	2ANTIP	2.c.i	PAL	SLAV	L1-L2	Tabasco	09.14	(Robertson 1991: 229)

kob– VER.TR.R: "to create, to copulate"

ko-bo=wa	*kob-ow-Ø*	2ANTIP	1.a.ii	CPN	HS. 1 XXIV	O1b	Motagua	09.16	(Barbara Fash n.p.)
u=ko-bo=wa	*u-kob-o-Ø*	2IND	1.a.ii	AGT	Skull	E1	Pasion	09.16	(Boot 2009b: 96)
u=ko-bo=wa	*u-kob-o-Ø*	2IND	1.a.ii	CPN	St. 3	B15	Motagua	09.11	(Alexander 1988: fig. 2)
u=ko-bo	*u-kob-o-Ø*	2IND	1.g.i	CRC	BCm. 3	D4	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 3)
u=ko-bo	*u-kob-o-Ø*	2IND	1.g.i	EDZ	HS. 1	80	Yucatan	09.10	(Mayer 2004: 32)
u=ko-bo=wa	*u-kob-o-Ø*	2IND	1.a.ii	PAL	96G	H6a	Tabasco	09.17	(Robertson 1991: fig. 265)
u=ko-bo=wa	*u-kob-o-Ø*	2IND	1.a.ii	PAL	TFC	G5	Tabasco	09.12	(Robertson 1991: fig. 153)
u=ko-bo	*u-kob-o-Ø*	2IND	1.g.i	QRG	St. I	D1b	Motagua	09.18	(Looper 2001: fig. 6)

koj – VER.INTR: "to go down"

i ko-jo=yi	*i['] koj-oy-Ø*	2COM	1.a.ii	NTN	Dwg. 88	G6	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
ko-jo=yi	*koj-oy-Ø*	2COM	1.a.ii	NTN	Dwg. 49	A2	Mopan-Pusilha	?	(MacLeod and Stone 1994: fig. 7.25)

kok – VER.TR.R: "to guard"

ko-ke=le	*ko<h>k-el*	3NMLS	1.b.i	NMP	St. 15	O1	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)

kuch – NOUN: "burden, cargo"

KUCH=ta=ja	*kuch-t-aj-Ø*	1INCH	1.f.ii	TIK	T. 4 Lnt. 3	E8	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
KUCH=ta=ja	*kuch-t-aj-Ø*	1INCH	1.f.ii	TIK	T. 1 Lnt. 3	C2	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 70)
KUCH=ta=ja	*kuch-t-aj-Ø*	1INCH	1.f.ii	TIK	T. 4 Lnt. 2	C1	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 73)
KUCH^{chi}=ta=ja	*kuch-t-aj-Ø*	1INCH	1.f.ii	CRC	Alt. 12	3	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)
KUCH^{chi} =ta=ja	*kuch-t-aj-Ø*	1INCH	1.f.ii	CRN	Alt. 4	B'4	Central Peten	09.18	(Canuto et al. 2008: fig. 2.15)
KUCH-chi=yu	*kuch-iy-Ø*	2INCH	1.c.ii	TIK	T. 4 Lnt. 2	B11	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 73)

kuch – VER.TR.R: "to carry"

ku-cha=ja	*ku<h>ch-aj-Ø*	1PASS	1.b.i	COL	P. Milwaukee	B3	Yucatan	09.12	(Graña-Behrens 2002: pl. 207)
ku-cha=ja	*ku<h>ch-aj-Ø*	1PASS	1.b.i	COL	K2794	C1	?	?	(Kerr 1990: 293)
ku-cha=ja	*ku<h>ch-aj-Ø*	1PASS	1.b.i	COL	K8927	B1	?	?	(Justin Kerr n.p.)

k'a' – VER.TR.R: "to diminish"

i k'a=a-yi	*i['] k'a'-ay-i-Ø*	2MED	1.e.ii	CPN	HS. 1 XLI	D1a	Motagua	09.16	(Barbara Fash n.p.)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	ALS	St. 4	B6	Pasion	09.10	(Eberl 2007: fig. A2.1)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	BLK	St. 5	C3	Central Peten	08.18	(Grube 2008: fig. 8.7)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	BPK	R. 1-IS	M1	Usumacinta	09.17	(Miller and Houston 1998: fig. 2)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	BPK	ScS. 4	B7b	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	BPK	ScS. 4	E2	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	CPN	HS. 1 LVIII	F1a	Motagua	09.16	(Barbara Fash n.p.)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	CRN	P. 2	N2b	Central Peten	09.12	(Mayer 1995: pl. 161)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	CRN	P. 4	C7	Central Peten	09.11	(Mayer 1995: pl. 145)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	DPL	HBh. 1	Y2a	Pasion	09.15	(Houston 1993: fig. 4.9)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	DPL	HBh. 1	R1	Pasion	09.15	(Houston 1993: fig. 4.9)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	DPL	St. 8	I10a	Pasion	09.14	(Houston 1993: fig. 4.14)
K'A'=ya	*k'a'[-y]-Ø=[i]y*	2MED	2.f.ii	LMN	St. 9	A7	Hondo	09.09	(Closs 1988: fig. 1)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	PAL	T18S	F6	Tabasco	09.14	(Schele and Mathews 1979: no. 397)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	PAL	TI-W	R9	Tabasco	09.12	(Robertson 1983b: fig. 97)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PAL	T19T	H2b	Tabasco	09.15	(Stuart 2005b: fig. 15)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PAL	TCI1	H7	Tabasco	09.12	(Schele and Mathews 1979: no. 281)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	PAL	PT	J10	Tabasco	09.14	(Robertson 1985b: fig. 258)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PMT	P. 96G	J5	Tabasco	09.13	(Stuart 2007c: 64)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PNG	P. 3	U2	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PNG	St. 3	J3a	Usumacinta	09.14	(Stuart and Graham 2003: 28)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	PNG	St. 7	C3a	Usumacinta	09.15	(Stuart and Graham 2003: 42)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	PNG	St. 8	A23a	Usumacinta	09.14	(Stuart and Graham 2003: 46)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	QRG	Zoo. G	N'1a	Motagua	09.17	(Looper 2001: fig. 4)
K'A'=yi=ya	*k'a'-y-Ø=iy*	2MED	2.f.ii	RAZ	Jd. Mask	B5	Central Peten	09.00	(Grube and Martin 2001: 40)
K'A'-ye=le	*k'a'-y-el*	2MED	2.f.ii	SCU	St. 1	A8	Mopan-Pusilha	09.16	(Laporte et al. 2006: fig. 1)
K'A'=ya CHAN-li?	*k'a'-[a]y-Ø chan-[i]l*	2MED	2.e.i	TIK	Hombre	C7	Central Peten	08.18	(Fahsen 1988: fig. 4)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	TIK	St. 40	F5	Central Peten	09.01	(Valdés and Fahsen 1998: fig. 9)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	TNA	MNA Disc	G1	Chiapas	?	(Peter Mathews n.p.)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 69	D1a	Chiapas	09.17	(Graham and Mathews 1996: 103)
K'A'=a-yi	*k'a'-ay-i-Ø*	2MED	1.a.ii	TNA	Mon. 77	pB1	Chiapas	?	(Graham and Mathews 1996: 110)
i K'A'=yi	*i['] k'a'-[a]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 149	D1	Chiapas	09.18	(Graham and Henderson 2006: 82)
i k'a=a-yi=ya	*i['] k'a'-y-Ø=iy*	2MED	1.f.ii	TNA	Mon. 165	K1	Chiapas	09.14	(Graham and Henderson 2006: 107)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	YAX	St. 12	A1	Usumacinta	09.16	(Tate 1992: fig. 137)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 27	A2	Usumacinta	09.16	(Graham and von Euw 1977: 59)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 27	F2a	Usumacinta	09.16	(Graham and von Euw 1977: 59)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 28	S1b	Usumacinta	09.16	(Graham and von Euw 1977: 61)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 59	L1	Usumacinta	09.16	(Graham 1979: 131)
K'A'=ya	*k'a'-[a]y-Ø*	2MED	2.e.i	ZAP	St. 5	C13b	Central Peten	09.00	(Schele, Fahsen and Grube 1992: fig. 2)
K'A'=ya	*k'a'-[a]y-Ø*	2MED	2.e.i	ZAP	St. 5	D15b	Central Peten	09.00	(Schele, Fahsen and Grube 1992: fig. 2)
K'A'=yi	*k'a'-[a]y-i-Ø*	2MED	2.e.ii	ZPB	K4692	C4	Western Peten	09.11	(Fitzsimmons 2012: fig. 3)

K'A'-ye=le	*k'a'-y-el*	3NMLS	1.f.ii	SCU	St. 1	A8	Mopan-Pusilha	09.16	(Laporte et al. 2006: fig. 1)

k'ab – NOUN: "hand"

k'a-ba=la	*k'ab-al*	1ATTR	1.a.i	YAX	Lnt. 23	H2b	Usumacinta	09.14	(Graham 1979: 135)
IX k'a-ba=la	*ix k'ab-al*	1ATTR	1.a.i	YAX	Lnt. 24	G3	Usumacinta	09.13	(Graham and von Euw 1977: 53)
IX k'a-ba=la	*ix k'ab-al*	1ATTR	1.a.i	YAX	Lnt. 25	I1a	Usumacinta	09.14	(Graham and von Euw 1977: 55)
IX k'a-ba=la	*ix k'ab-al*	1ATTR	1.a.i	YAX	Lnt. 25	R2	Usumacinta	09.14	(Graham and von Euw 1977: 56)
IX k'a-ba=la	*ix k'ab-al*	1ATTR	1.a.i	YAX	Lnt. 28	Q1	Usumacinta	09.16	(Graham and von Euw 1977: 61)
IX k'a-ba	*ix k'ab-a[l]*	1ATTR	1.g.i	YAX	Lnt. 28	X2a	Usumacinta	09.16	(Graham and von Euw 1977: 61)

k'a[h]k' – NOUN: "fire"

ti K'AK'=la ju-lu	*ti k'a[h]k'-[a]l jul*	1ATTR	2.e.i	YAX	Lnt. 24	D1	Usumacinta	09.14	(Graham and von Euw 1977: 53)

k'al – VER.TR.R: "to bind"

K'AL=TUN^{ni}=ja	*k'al-Ø-tun-[a]j-Ø*	1INCH	2.e.i	CPN	Bur. 1 Peccary	A2	Motagua	08.17	(Grube and Martin 2001: 10)
k'a-la=ba=ja	*k'al-b-aj-Ø te'*	1INCH	1.f.ii	PAL	T19B-S	A'1	Tabasco	09.15	(Stuart 2005b: pl. 2)
K'AL=HUN=ja	*k'al-Ø-hun-[a]j-Ø*	1INCH	2.e.i	TIK	St. 31	H8	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52d)
u=K'AL=ja	*u-k'a<h>l-[a]j-Ø*	1PASS	2.e.i	ALH	Jd. 1	A6	Hondo	09.07	(Mathews and Pendergast 1979: fig. 2)
K'AL=ja HUN?	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	BPK	ScS. 5	A2	Usumacinta	09.16	(Alexandre Safronov n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	24	B4	Yucatan	11.04	(Anders and Deckert 1975: 24)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	46b	E1	Yucatan	11.04	(Anders and Deckert 1975: 46)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	47b	A1	Yucatan	11.04	(Anders and Deckert 1975: 47)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	47b	B1	Yucatan	11.04	(Anders and Deckert 1975: 47)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	47b	C1	Yucatan	11.04	(Anders and Deckert 1975: 47)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	47b	D1	Yucatan	11.04	(Anders and Deckert 1975: 47)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	47b	E1	Yucatan	11.04	(Anders and Deckert 1975: 47)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	48b	A1	Yucatan	11.04	(Anders and Deckert 1975: 48)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	48b	B1	Yucatan	11.04	(Anders and Deckert 1975: 48)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	48b	C1	Yucatan	11.04	(Anders and Deckert 1975: 48)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	48b	D1	Yucatan	11.04	(Anders and Deckert 1975: 48)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	48b	E1	Yucatan	11.04	(Anders and Deckert 1975: 48)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	49b	A1	Yucatan	11.04	(Anders and Deckert 1975: 49)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	49b	B1	Yucatan	11.04	(Anders and Deckert 1975: 49)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	49b	C1	Yucatan	11.04	(Anders and Deckert 1975: 49)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	49b	D1	Yucatan	11.04	(Anders and Deckert 1975: 49)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	49b	E1	Yucatan	11.04	(Anders and Deckert 1975: 49)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	50b	A1	Yucatan	11.04	(Anders and Deckert 1975: 50)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	50b	B1	Yucatan	11.04	(Anders and Deckert 1975: 50)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	50b	C1	Yucatan	11.04	(Anders and Deckert 1975: 50)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	50b	D1	Yucatan	11.04	(Anders and Deckert 1975: 50)

K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	C Dr.	50b	E1	Yucatan	11.04	(Anders and Deckert 1975: 50)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	CHN	IS-LU	D1	Yucatan	10.02	(Krochock 1989: fig. 1)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CHN	MON-L1	A1a	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 55)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CHN	MON-L3	A5b	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 57)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CHN	MON-L4	C5	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CHN	T4L-L2	E1	Yucatan	10.02	(Krochock 1989: fig. 5)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CHN	T4L-L3	B1	Yucatan	10.02	(Krochock 1989: fig. 6)
K'AL=ja	*k'a<h>l-aj-Ø*	1PASS	2.e.i	CHN	THJ-E	B1	Yucatan	10.00	(Grube, Lacadena and Martin 2003: 32)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	CNC	P. 1	D1	Southern Peten	09.13	(Yuriy Polyukhovych n.p.)
K'AL-la=ja HUN	*k'a<h>l-aj-Ø hun*	1PASS	1.a.i	COB	St. 4	I8	Quintana Roo	09.09	(Graham and von Euw 1997: 31)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K504	B1	?	?	(Coe 1978: #7)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K731	B1	?	?	(Reents-Budet 1994: 208)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1183	B1	?	?	(Reents-Budet 1994: 279)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1775	B1	?	?	(Kerr 1989: 109)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1941	B1	Central Peten	?	(Kerr 1990: 194)
k'a=ja	*k'a<h>[l]-[a]j-Ø*	1PASS	2.g.i	COL	K2292	B1	?	?	(Kerr 1990: 230)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K2292	S1	?	?	(Kerr 1990: 230)
u=K'AL=ja	*u-k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K2323	O4	Central Peten	?	(Kerr 1990: 234)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K2323	N7	Central Peten	?	(Kerr 1990: 234)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	K2774	B1	?	?	(Kerr 1990: 302)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	God D Vessel	B1	?	?	(Boot 2008: fig. 1b)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	Dallas Bone	B2	?	?	(Stuart 2007a)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K731	B1	?	?	(Reents-Budet 1994: 208)
K'AL=ji	*k'a<h>l-[a]j-Ø*	1PASS	2.e.ii	COL	K530	B1	?	?	(Coe 1978: #11)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K554	B1	?	?	(Schele and Miller 1986: pl. 48a)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K555	B1	?	?	(Coe 1978: #8)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K671	B1	?	?	(Kerr 1989: 32)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K764	B1	?	?	(Kerr 1989: 45)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	Shl. Atkins	A4	?	?	(Christian Prager n.p.)
K'AL=ja TUN^{ni}	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	COL	JM Plaque 4442	A11	?	08.11	(Mora-Marín 2001: fig. A1.15)
i K'AL-la=ja	*i['] k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	Lnt. Kansas	A4a	Central Peten	09.03	(Mayer 1995: pl. 96)
k'a-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	Col. Hecelchakan	B1	Yucatan	09.15	(Mayer 1991: pl. 100)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	P. Stendahl	C2b	Usumacinta	09.14	(Bíró 2005: fig. 6)
k'a-K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	P. Po Throne	D2	Usumacinta	09.04	(Arellano Hernández 1998: fig. 5)
K'AL=ja TUN	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	COL	P. Milwaukee	Bp3	Yucatan	09.12	(Mayer 1989: pl. 85)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1256	B1	Pasion	?	(Robicsek and Hales 1982: #54)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1377	B1	?	?	(Robicsek and Hales 1982: fig. 31b)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K1522	B1	?	?	(Robicsek and Hales 1982: #66)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3026	B1	?	?	(Kerr 1992: 380)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3035	B1	?	?	(Persis Clarkson n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3324	A2	?	?	(Kerr 1992: 406)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3649	B1	?	?	(Kerr 1992: 426)
K'AL=ja	*k'a<h>l-aj-Ø*	1PASS	2.e.i	COL	K3876	B1	?	?	(Justin Kerr n.p.)

K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3924	B1	?	?	(Kerr 1992: 446)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K3996	B1	?	?	(Kerr 1992: 449)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4021	B1	?	?	(Kerr 1992: 455)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4143	B1	?	?	(Kerr 1992: 465)
K'AL=ja	*k'a<h>l-aj-Ø*	1PASS	2.e.i	COL	K4357	O1	?	?	(Kerr 1992: 477)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4407	B1	?	?	(Kerr 1994: 540)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4550	A1	?	?	(Kerr 1994: 551)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4605	B1-C1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K4684	B1	Yucatan	?	(Kerr 1994: 589)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	K4959	A1	?	?	(Kerr 1994: 626)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5016	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5060	B1	?	?	(Kerr and Kerr 2000: 915)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5062	B1	?	?	(Kerr and Kerr 2000: 916)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5070	B1	?	?	(Kerr and Kerr 2000: 919)
? K'AL=ja	*? k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5652	J1	?	?	(Justin Kerr n.p.)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	MFA 1988.1284	B1	Central Peten	?	(Boot 2009a: fig. 1)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5847	B1	?	?	(Kerr and Kerr 2000: 943)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K5857	K1	?	?	(Kerr and Kerr 1997: 821)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	K6418	E1	Central Peten	?	(Kerr and Kerr 2000: 963)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6436	A1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6538	B1	?	?	(Kerr and Kerr 2000: 971)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6551	B1	Central Peten	?	(Grube and Gaida 2006: fig. 33.2)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6659	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6814	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K6998	B1	Yucatan	?	(Kerr and Kerr 1997: 837)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K7062	C1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K7460	B1	?	?	(Kerr and Kerr 2000: 998)
K'AL=ja	*k'a<h>l-aj-Ø*	1PASS	2.e.i	COL	K7821	B1	?	?	(Kerr and Kerr 2000: 1010)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8076	B1	?	?	(Kerr and Kerr 2000: 1016)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8242	D1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8242	S1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8257	D1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8342	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8417	C1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8424	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8497	B2	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8719	B1	?	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	K8740	B1	Yucatan	?	(Justin Kerr n.p.)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	COL	K8741	B1	Yucatan	?	(Justin Kerr n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	Berlin Ca 44347	B1	Yucatan	?	(Grube and Gaida 2006: #27)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	COL	Berlin Ca 50113	B1	Central Peten	?	(Grube and Gaida 2006: #33)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	CPH	J. 1	Ap4	Yucatan	09.17	(Graña-Behrens 2002: pl. 46)
u=K'AL=ja TUN	*u-k'a<h>l-[a]j-Ø-Ø tun*	1PASS	2.e.i	CPN	St. 7	B7b	Motagua	09.09	(Schele and Stuart 1986a: fig. 2)

NAH K'AL-la=ja SAK=HUN	*nah k'a<h>l-aj-Ø sak hun*	1PASS	1.a.i	CPN	St. 16	C3	Motagua	09.01	(Riese and Baudez 1983: fig. R-3)
NAH K'AL-wi=ja ?	*nah k'a<h>l-w-[a]j-Ø ?*	1PASS	4.a.i	CPN	Mon. 107	E1	Motagua	09.16	(Riese and Baudez 1983: fig. R-1)
YAX K'AL=ja ?	*yax k'a<h>l-[a]j-Ø ?*	1PASS	2.e.i	DPL	HS. 2 C IV	E1	Pasion	09.12	(Fahsen 2002: fig. 6)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	DPL	K2784	B1	Pasion	?	(Kerr 1990: 291)
K'AL-la=ja ?	*k'a<h>l-aj-Ø ?*	1PASS	1.a.i	EDZ	HS. 1	45	Yucatan	09.10	(Mayer 2004: 24)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	ITN	St. 17	F12	Pasion	09.17	(Ian Graham n.p.)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	MAR	St. 1	B2	Usumacinta	09.17	(Lopes and Davletshin 2004: fig. 1)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	MRL	St. 2	C10	Tabasco	09.15	(Pavón n.p.)
3 K'AL-la=ja HUN	*3 k'a<h>l-aj-Ø hun*	1PASS	1.a.i	MRL	St. 4	F4	Tabasco	09.13	(Lizardi Ramos 1961: 109)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	MTL	K1004	B1	Central Peten	09.15	(Robicsek and Hales 1982: #186)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	MTL	K6552	B1	Central Peten	?	(Kerr and Kerr 2000: 973)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	NAR	K5723	B1	Central Peten	?	(Reents-Budet 1994: 84)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	OXK	Lnt. 2	A2	Yucatan	09.02	(García Campillo and Lacadena 1990: fi. 2)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	OXK	K3199	B1	Yucatan	09.16	(Kerr 1992: 309)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	OXK	K4378	B1	Yucatan	09.16	(Alfonso Lacadena n.p.)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	OXK	COL Vessel	A1	Yucatan	09.16	(Boot 2010b: fig. 4)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	HS. 1	A11	Tabasco	09.11	(Mayer 1995: pl. 36)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pA10	Tabasco	09.11	(Peter Mathews n.p.)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	WARP	G4	Tabasco	09.13	(Schele 1990c: fig. 1)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pC9a	Tabasco	09.16	(Bernal Romero 2002: fig. 12)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pE5a	Tabasco	09.16	(Bernal Romero 2002: fig. 13)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pH6a	Tabasco	09.16	(Bernal Romero 2002: fig. 15)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pJ2a	Tabasco	09.16	(Bernal Romero 2002: fig. 16)
K'AL-la=ja HUN	*k'a<h>l-aj-Ø hun*	1PASS	1.a.i	PAL	K'TOK	pJ8	Tabasco	09.16	(Bernal Romero 2002: fig. 18)
K'AL^{li}=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.b.i	PAL	PMI1	A3	Tabasco	09.13	(Linda Schele SD 112)
K'AL=ja HUN^{na}	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	PMI1	C1	Tabasco	09.13	(Linda Schele SD 110)
u=K'AL=ja TUN	*u-k'a<h>l-[a]j-Ø-tun-Ø*	1PASS	2.e.i	PAL	TCI1	E2	Tabasco	09.12	(Schele and Mathews 1979: no. 281)
K'AL=ja-ji=ji	*k'a<h>l-[a]j-Ø=[i]j=i[y]*	1PASS	2.e.i	PAL	PT	E8	Tabasco	09.14	(Robertson 1985b: fig. 258)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	PAL	PT	O1	Tabasco	09.14	(Robertson 1985b: fig. 258)
K'AL=ji=ya SAK HUN	*k'a<h>l-j-Ø=iy sak hun*	1PASS	2.f.ii	PAL	PT	P18	Tabasco	09.14	(Robertson 1985b: fig. 258)
K'AL=ji=ya SAK HUN	*k'a<h>l-j-Ø=iy sak hun*	1PASS	2.f.ii	PAL	PT	R5	Tabasco	09.14	(Robertson 1985b: fig. 258)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	PAL	PT	U4	Tabasco	09.14	(Robertson 1985b: fig. 258)
2 K'AL=ji SAK HUN^{na}	*k'a<h>l-[a]j-Ø sak hun*	1PASS	2.e.ii	PAL	TI-M	I2	Tabasco	09.12	(Robertson 1983b: fig. 96)
i K'AL=ja HUN	*i['] k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	SLAV	A5a	Tabasco	09.14	(Robertson 1991: fig. 229)
K'AL=ja SAK HUN	*k'a<h>l-[a]j-Ø sak hun*	1PASS	2.e.i	PAL	TC	L3	Tabasco	09.12	(Robertson 1991: fig. 9)
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	PAL	K'TOK	pA9	Tabasco	09.16	(Bernal Romero 2002: fig. 9)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	PMT	P. 9	pB2	Tabasco	09.13	n/a
K'AL=ja TUN	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	PRU	St. 15	Ep2	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
K'AL=ja TUN	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	PRU	St. 15	Ep7	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
i K'AL-la=ja	*i['] k'a<h>l-aj-Ø*	1PASS	1.a.i	PUS	St. H	A12	Mopan-Pusilha	09.11	(Prager 2002a, III: fig. 10)
3 K'AL=ja TUN	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	QRG	St. C	A7	Motagua	09.17	(Looper 2003: fig. 5.1)
K'AL=ja=ya	*k'a<h>l-j-Ø=[i]y*	1PASS	2.f.ii	QRG	St. J	F4	Motagua	09.16	(Looper 2003: fig. 3.30a)
K'AL=ja ?	*k'a<h>l-[a]j-Ø ?*	1PASS	2.e.i	QRG	Zoo. G	M2	Motagua	09.17	(Looper 2001: fig. 1)

K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	QRG	Zoo. G	N'4a	Motagua	09.17	(Looper 2001: fig. 4)
i k'a-la	*i['] k'a<h>l-a[j]-Ø*	1PASS	1.g.i	SBL	St. 4	A3	Pasion	10.01	(Graham 1996: 19)
K'AL=ja TUN^{ni}	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	TIK	Marcador	E7b	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	TIK	MT 58	B1	Central Peten	09.15	n/a
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	TIK	MT 61	A1	Central Peten	09.15	n/a
K'AL=ja HUN	*k'a<h>l-[a]j-Ø hun*	1PASS	2.e.i	TNA	Mon. 3	B9	Chiapas	09.13	(Mathews 1983: 18)
K'AL-la=ja=ji=ya	*k'a<h>l-aj-Ø=ij=iy*	1PASS	1.a.i	TNA	Frg. 37	Ap2	Chiapas	?	(Peter Mathews n.p.)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	TNA	Mon. 99	B1	Chiapas	?	(Graham and Mathews 1996: 122)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	TNA	Mon. 110	J1a	Chiapas	09.14	(Graham and Mathews 1999: 143)
K'AL=ja ?-TUN	*k'a<h>l-aj-Ø ?-tun*	1PASS	1.a.i	TNA	Mon. 111	J1	Chiapas	09.13	(Graham and Mathews 1999: 145)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	TNA	Mon. 139	K1	Chiapas	09.13	(Graham and Mathews 1999: 169)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	TNA	Stucco	1	Chiapas	?	(Sven Gronemeyer 39-000016)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	TPX	MV 55	B1	Central Peten	?	(Fialko 2000: fig. 103)
K'AL=ja TUN	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	TRS	St. 1	A10	Pasion	08.19	(Lacadena 2011: fig. 4a)
K'AL=ja TUN^{ni}	*k'a<h>l-[a]j-Ø tun*	1PASS	2.e.i	TRT	Bx. 1	B2	Tabasco	09.12	(Gronemeyer 2006b: pl. 1)
K'AL=ja BIX	*k'a<h>l-[a]j-Ø bix*	1PASS	2.e.i	TRT	Mon. 8	A3	Tabasco	09.10	(Gronemeyer 2006b: pl. 14)
K'AL-la=ja ?	*k'a<h>l-aj-Ø ?*	1PASS	1.a.i	UXM	Cst. 1	C1	Yucatan	10.03	(Graham and von Euw 1992: 139)
K'AL-la=ja ?	*k'a<h>l-aj-Ø ?*	1PASS	1.a.i	UXM	Cst. 1	H1	Yucatan	10.03	(Graham and von Euw 1992: 139)
k'a-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	XCA	Pil. 1	B1	Yucatan	09.15	(Graña-Behrens 2002: pl. 175)
k'a-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	XLM	Col. 1	B1	Yucatan	09.15	(Graham and von Euw 1992: 173)
k'a-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	XLM	K8017	C1	Yucatan	09.16	(Kerr and Kerr 2000: 1013)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	XLM	P. 5	A1	Yucatan	09.15	(Graham and von Euw 1992: 183)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	XLM	P. 7	A1	Yucatan	09.15	(Graham and von Euw 1992: 185)
i K'AL=ja	*i['] k'a<h>l-[a]j-Ø*	1PASS	2.e.i	YAX	HS. 3 III	D11	Usumacinta	09.15	(Graham 1982: 169)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	YUL	Lnt. 1	I2	Yucatan	10.02	(Love 1989a: fig. 2)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	YUL	Lnt. 2	A3	Yucatan	10.02	(Love 1989a: fig. 3)
K'AL-la=ja	*k'a<h>l-aj-Ø*	1PASS	1.a.i	YUL	Lnt. 2	I2	Yucatan	10.02	(Love 1989a: fig. 3)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	YXC	Cst. 1	A3	Yucatan	09.15	(Mayer 1991: pl. 115)
K'AL=ja	*k'a<h>l-[a]j-Ø*	1PASS	2.e.i	ZBP	K2803	B1	Western Peten	?	(Schele and Miller 1986: pl. 96a)
K'AL=wi HAB	*k'al-[a]w-Ø ha'ab*	2ANTIP	2.e.ii	AGT	St. 16	B2	Pasion	09.10	(Houston 2014: fig. 12.11)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	AGT	St. 16	E2	Pasion	09.10	(Houston 2014: fig. 12.11)
i K'AL=wi TUN	*i['] k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	CHP	St. 1	B10	Central Peten	09.09	(Grube 2008: fig. 8.12)
K'AL=wa	*k'al-[a]w-Ø*	2ANTIP	2.e.i	COL	Lnt. 7 Site R	A2	Usumacinta	09.17	(Mayer 1995: pl. 122)
K'AL=wi HUN	*k'al-[a]w-Ø hun*	2ANTIP	2.e.ii	CRN	St. 1	pE13b	Central Campeche	09.13	(Canuto et al. 2008: fig. 2.10)
K'AL=wi TUN^{ni}	*k'al-[a]w-Ø tun*	2ANTIP	2.e.i	DPL	St. 8	H5	Pasion	09.14	(Houston 1993: fig. 4.14)
K'AL=wi TUN^{ni}	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	DPL	St. 14	E1a	Pasion	09.14	(Houston 1993: fig. 3.24)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	DPL	St. 15	E3	Pasion	09.14	(Houston 1993: fig. 3.25)
K'AL=wi TUN^{ni}	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	MQL	St. 3	G4a	Southern Peten	09.19	(Graham 1967: fig. 49)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	NAR	St. 21	E10a	Central Peten	09.13	(Graham and von Euw 1975: 54)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	NAR	St. 23	G19	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AL=wa	*k'al-[a]w-Ø*	2ANTIP	2.e.i	PNG	Alt. 1	H'2a	Usumacinta	09.13	(Teufel 2004: 535)
K'AL=wi TUN^{ni}	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	PUS	St. H	C5	Mopan-Pusilha	09.11	(Prager 2002a, III: fig. 10)
K'AL=wa HUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.i	QRG	Alt. O'	M1a	Motagua	09.18	(Jones 1983)

K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	TIK	St. 31	D9	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	TIK	St. 31	D18	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
K'AL=wa TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.i	TIK	St. 31	F16	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
K'AL=wi TUN	*k'al-[a]w-Ø tun*	2ANTIP	2.e.ii	TIK	MT. 217	C1	Central Peten	09.09	(Culbert 1993: fig. 50e)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	AGT	St. 19	B3	Pasion	09.17	(Houston 2014: fig. 12.8)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	ALS	St. 8	F6b	Pasion	09.09	(Alexander Voß n.p.)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	BPK	St. 1	G2	Usumacinta	09.17	(Mathews 1980: fig. 3)
u=k'a-la	*u-k'al-a-Ø*	2IND	1.g.i	C Dr.	2d	D1	Yucatan	11.04	(Anders and Deckert 1975: 2)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	CAY	Alt. 4	E'1	Usumacinta	09.15	(Mathews 1998: fig. 3)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	COL	P. DOAKS4	B2	Tabasco	09.18	(Mayer 1987: pl. 24)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	COL	P. Stokes	A6	Usumacinta	09.17	(Mayer 1991: pl. 118)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	CPN	Mon. 19	J1	Motagua	09.12	(Schele 1987f: fig. 3)
u=K'AL=wa TUN	*u-k'al-[a]-Ø tun*	2IND	2.e.i	CPN	St. 15	H1	Motagua	09.04	(Schele 1990b: fig. 4)
u=K'AL=wi TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.ii	CRC	St. 13	A16	Mopan-Pusilha	09.04	(Beetz and Satterthwaite 1981: fig. 13b)
u=K'AL=wi TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.ii	CRC	St. 16	B16	Mopan-Pusilha	09.05	(Beetz and Satterthwaite 1981: fig. 15b)
u=K'AL=wa HUN	*u-k'al-[a]-Ø hun*	2IND	2.e.i	CRN	St. 2	D9	Central Peten	09.11	(Canuto et al. 2008: fig. 2.11)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	IXK	St. 5	K1	Mopan-Pusilha	09.18	(Graham 1980: 149)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	IXL	Alt. 1	B3	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 81c)
u=K'AL=wa TUN	*u-k'al-[a]-Ø tun*	2IND	2.e.i	IXL	St. 1	A2	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 80)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	LAC	P. 1	C1	Usumacinta	09.15	(Schaffer 1991: fig. 4)
u=K'AL=wi TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.ii	MAR	St. 3	B2	Usumacinta	09.18	(John Montgomery n.p.)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	MQL	St. 4	B2	Southern Peten	09.19	(Graham 1967: fig. 51)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	NAR	St. 10	B10	Central Peten	09.19	(Graham and von Euw 1975: 31)
u=K'AL=wi	*u-k'al-[a]-Ø*	2IND	2.e.ii	NAR	HS. 1 IV	G2a	Mopan-Pusilha	09.10	(Graham 1978: 108)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	NAR	St. 32	W7	Central Peten	09.19	(Graham 1978: 86)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PAL	T21B-P	F5	Tabasco	09.15	(Stuart 2006b: 187)
xa=k'a-la	*x-a-k'al-a-Ø*	2IND	1.g.i	PAL	T21B-P	X1a	Tabasco	09.15	(Stuart 2006b: 187)
xa=k'a-la	*x-a-k'al-a-Ø*	2IND	1.g.i	PAL	T21B-P	Y1a	Tabasco	09.15	(Stuart 2006b: 187)
u=K'AL=wa TUN-?	*u-k'al[-a]-Ø tun*	2IND	2.e.i	PAL	HCM1	F1b	Tabasco	09.11	(Robertson 1985a: fig. 278)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PAL	PT	F18	Tabasco	09.14	(Robertson 1985b: fig. 258)
i u=K'AL=wa HUN	*i['] u-k'al-[a]-Ø hun*	2IND	2.e.i	PAL	PT	K10	Tabasco	09.14	(Robertson 1985b: fig. 258)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PMT	P. 1	pI5	Tabasco	09.17	(Schele and Miller 1986: fig. III.2)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PMT	P. X	pD2	Tabasco	09.14	(Lizardi Ramos 1963: fig. 6)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNG	St. 3	J17	Usumacinta	09.14	(Stuart and Graham 2003: 28)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNG	St. 9	B12	Usumacinta	09.15	(Stuart and Graham 2003: 52)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNG	St. 16	D1	Usumacinta	09.16	(Teufel 2004: 393)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNG	St. 22	C6	Usumacinta	09.16	(Teufel 2004: 405)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNG	St. 37	C12	Usumacinta	09.12	(Teufel 2004: 454)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	PNH	St. 1	D1	Tabasco	10.00	(Ian Graham n.p.)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	QRG	St. S	C5	Motagua	09.15	(Looper 2003: fig. 3.15)
u=K'AL=wa	*u-k'al-[a]-Ø*	2IND	2.e.i	SBL	St. 1	A5	Pasion	10.02	(Graham 1996: 15)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	SBL	St. 8	A2	Pasion	10.01	(Graham 1996: 27)
u=K'AL-la BAK	*u-k'al-a-Ø bak*	2IND	1.g.i	TIK	MT 55:A	A3-A4	Central Peten	09.15	(Trik 1963: fig. 1)

u=K'AL-la BAK	*u-k'al-a-Ø bak*	2IND	1.g.i	TIK	MT 55:B	A3-A4	Central Peten	09.15	(Trik 1963: fig. 2)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	TRS	St. 2	A7	Pasion	09.02	(Lacadena 2011: fig. 4b)
u=K'AL=wa TUN^{ni}	*u-k'al-[a]-Ø tun*	2IND	2.e.i	UXB	St. 22	A4	Mopan-Pusilha	09.16	(Wanyerka 2003: fig. 99)
u=K'AL=wa TUN	*u-k'al-[a]-Ø tun*	2IND	2.e.i	UXB	Msc. 1	A1	Mopan-Pusilha	?	(Wanyerka 2003: fig. 100)
u=K'AL=wi	*u-k'al-[a]-Ø*	2IND	2.e.ii	YAX	HS. 3 III	D10b	Usumacinta	09.15	(Graham 1982: 169)
K'AL=ya	*k'al-[a]y-Ø*	2MED	2.e.i	COL	K4960	pA1	?	?	(Kerr 1994: 627)
u=K'AL=yi HUN	*u-k'al-[a]y-Ø-Ø hun*	2MED	4.a.i	PAL	TC	O12	Tabasco	09.12	(Robertson 1991: fig. 9)

k'an – ADJ: "yellow, precious"

? K'AN=JAL NAH	*k'an-j-al nah-Ø*	1INCH	2.f.ii	PAL	TFCB	H1	Tabasco	09.12	(Schele and Freidel 1990: 249)
K'AN=ja=la	*k'an-j-al*	1INCH	2.f.ii	COL	K5509	T1	?	?	(Coe 1973: #38)
K'AN^{na}=ja=la	*k'an-j-al-Ø*	1INCH	2.f.ii	NAR	K635	H'1	Central Peten	?	(Robicsek and Hales 1982: #183)
NAH K'AN^{na}=ja=la	*nah k'an-j-al-Ø*	1INCH	2.f.ii	TRT	Mon. 6	M3-N3	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
NAH K'AN^{na}=JAL	*nah k'an-j-al-Ø*	1INCH	2.f.ii	CPN	T. 11 SDWP	A3	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 7)
u=NAH=K'AN=JAL	*u-nah-k'an-j-al-Ø*	1INCH	2.f.ii	PAL	T21B-P	G10	Tabasco	09.15	(Stuart 2006b: 187)

k'as – VER.TR.R: "to break up, to split"

k'a-sa=ja	*k'a<h>s-aj-Ø*	1PASS	1.a.i	C Ma.	41a	C1	Yucatan	11.11	(Anders 1967: 41)
i k'a-sa=ya	*i['] k'as-ay-Ø*	2MED	1.a.i	PUS	St. D	D11	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
k'a-sa=ya	*k'as-ay-Ø*	2MED	1.a.i	PUS	St. D	F12	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)

k'ay – VER.INTR: "to sing"

K'AY=li	*k'ay-[i]l*	3NMLS	3.a.i	EKB	M. R22	F1	Yucatan	09.17	(Lacadena 2002: fig. 22a)

k'et – VER.TR.R: "to keep"

u=k'e-te=wa	*u-k'et-e-Ø*	2IND	1.a.ii	CPN	K4655	G1	Motagua	09.17	(Linda Schele SD 1041)

k'in – NOUN: "sun, day"

K'IN-ni=li cha-ki	*k'in-il chak*	1ATTR	1.a.i	CML	U. 26 Sp. 5	A4-A5	Tabasco	09.16	(Marc Zender n.p.)
$^{k'i}$K'IN=ja	*k'in-[a]j-Ø*	1INCH	2.e.i	COL	K504	H1	?	?	(Coe 1978: #7)

k'inich – NOUN

K'IN-chi=li KAB	*k'in[i]ch-il kab*	1ATTR	1.a.i	NAR	St. 22	E14	Central Peten	09.13	(Graham and von Euw 1975: 56)
K'IN-ni-chi=la	*k'inich-il*	1ATTR	1.a.ii	QRG	St. F	D17b	Motagua	09.16	(Looper 2003: fig. 4.5)

k'ub – VER.TR.R: "to deposit, to offer"

k'u-ba=ja	*k'u<h>b-aj-Ø*	1PASS	1.a.i	TIK	Alt. 5	15	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 23)

k'uh ~ k'u' – NOUN: "god"

?-ba u=K'U'=lu a-tz'u-le wa-ji	*? u-k'u'-[u]l a[j] tz'ul waj*	1ATTR	2.e.i	CHN	CC-HB	55	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
K'UH-hu SEIBAL-AJAW	*k'uh-u[l] seibal ajw*	1ATTR	1.g.i	ANL	P. 1	B3	Pasion	10.01	(Graham 1990: fig. 18)
u=K'UH=HUL TZAK	*u-k'uh-ul tzak-Ø*	1ATTR	1.e.iv	ANL	P. 1	C1a	Pasion	10.01	(Graham 1990: fig. 18)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	Frg. 9	C2b	Yucatan	10.02	(Graña-Behrens 2002: pl. 10)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	MON-L4	E4a	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	MON-L4	E1a	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	MON-L5	C1b	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 59)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	T4L-L2	H5	Yucatan	10.02	(Krochock 1989: fig. 5)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	T4L-L3	C1	Yucatan	10.02	(Krochock 1989: fig. 6)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	T4L-L3	E1	Yucatan	10.02	(Krochock 1989: fig. 6)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	T4L-L4	G7	Yucatan	10.02	(Krochock 1989: fig. 7)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	CHN	T3L-L1	F2	Yucatan	10.02	(Krochock 1989: fig. 3)
K'U'=lu ?-la	*k'u'-[u]l ?*	1ATTR	2.e.i	CHN	CC-HB	56a	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
K'U'=lu a	*k'u'-[u]l a[j]*	1ATTR	2.e.i	CHN	T4L-L1	D2	Yucatan	10.02	(Krochock 1989: fig. 4)
K'U'=lu a	*k'u'-[u]l a[j]*	1ATTR	2.e.i	CHN	T4L-L4	D3	Yucatan	10.02	(Krochock 1989: fig. 7)
K'U'=lu AJ k'a-k'a	*k'u'-[u]l aj k'a[h]k'*	1ATTR	2.e.i	CHN	MON-L4	Z4	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
K'U'=lu a-tz'u-le wa-WAJ	*k'u'-[u]l a[j] tz'ul waj*	1ATTR	2.e.i	CHN	MON-L5	D1-D2	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 59)
K'U'=lu ko-ko-ma	*k'u'-[u]l kokom*	1ATTR	2.e.i	CHN	ADZ-LF	E2	Yucatan	10.02	(Graña-Behrens 2002: pl. 42)
K'U'=lu ko-ko-ma	*k'u'-[u]l kokom*	1ATTR	2.e.i	CHN	CC-HB	57a	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
tu K'U'=lu TUN^{ni}	*t-u k'u'-[u]l tun*	1ATTR	2.e.i	CHN	ADZ-LF	G1	Yucatan	10.02	(Graña-Behrens 2002: pl. 42)
TUN^{ni} K'U'=lu ?	*tun k'u'-[u]l ?*	1ATTR	2.e.i	CHN	ADZ-LF	H2	Yucatan	10.02	(Graña-Behrens 2002: pl. 42)
u=K'U'=lu a-tz'u-le	*u-k'u'-[u]l a[j] tz'ul*	1ATTR	2.e.i	CHN	MON-L7	B3	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 61)
u=K'U'=lu o-to-ti	*u-k'u'-[u]l otot-Ø*	1ATTR	2.e.i	CHN	ADZ-LF	C2	Yucatan	10.02	(Graña-Behrens 2002: pl. 42)
K'UH=lu	*k'uh-[u]l*	1ATTR	2.e.i	CKL	Mon. 22	E2	Chiapas	09.06	(Navarrete 1984: fig. 69)
K'UH=JUL^{la}	*k'uh-ul*	1ATTR	1.e.iv	CPN	T. 22a Stone	F2a	Motagua	09.18	(Schele et al. 1989: fig. 29)
K'UH=JUL^{lu}	*k'uh-ul*	1ATTR	1.e.iv	CPN	Alt. U	U3	Motagua	09.18	(Schele and Stuart 1986b: fig. 1)
K'UH= JUL^{lu}	*k'uh-ul*	1ATTR	1.e.iv	CPN	Alt. T	A3-B3	Motagua	09.17	(Schele and Freidel 1990: fig. 8.18)
K'UH= JUL^{lu}	*k'uh-ul*	1ATTR	1.e.iv	CPN	St. H	B1b	Motagua	09.14	(Maudslay 1974, I: pl. 61)
k'u=lu	*k'u['/h]-ul*	1ATTR	1.a.i	CRC	Alt. 12	23	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)
u=K'UH= JUL^{lu}	*u-k'uh-ul*	1ATTR	1.e.iv	CRC	St. 17	E1	Mopan-Pusilha	10.01	(Martin and Grube 2000: 99)
K'UH=lu	*k'uh-[u]l*	1ATTR	2.e.i	CRO	St. 1	C1	Pasion	09.13	(Mayer 1991: pl. 144)
K'UH=u KAJ^{ji} AJAW	*k'uh-u[l] kaj ajaw*	1ATTR	1.g.i	DCB	St. 2	L1b	Usumacinta	09.14	(Cougnaud et al. 2003: fig. 7)
u=K'UH=lu TZAK^{ku}	*u-k'uh-ul-Ø tzak*	1ATTR	2.e.i	DCB	St. 1	F4	Usumacinta	09.14	(Cougnaud et al. 2003: fig. 4)
K'UH=lu	*k'uh-[u]l*	1ATTR	2.e.i	IXZ	St. 4	B4a	Mopan-Pusilha	09.17	(Graham 1980: 181)
u=?=K'UH=lu	*u-?-k'uh-[u]l*	1ATTR	2.e.i	NAR	Alt. 1	D6	Central Peten	09.08	(Graham 1978: 104)
K'UH=JUL	*k'uh-ul*	1ATTR	1.e.iv	NMP	St. 2	F3	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
tu=K'UH=JUL	*t-u-k'uh-ul*	1ATTR	1.e.iv	NMP	St. 4	Bp3	Mopan-Pusilha	09.15	(Wanyerka 2003: fig. 20)

u=K'UH-hu=lu PIK	*u-k'uh-ul pik*	1ATTR	1.a.i	PAL	TI-M	J4-I5	Tabasco	09.12	(Robertson 1983b: fig. 96)
K'UH=JUL^{lu}	*k'uh-ul*	1ATTR	1.e.iv	PNG	St. 12	Ap18a	Usumacinta	09.18	(Stuart and Graham 2003: 62)
IX K'UH=la	*ix k'uh-[u]l*	1ATTR	2.e.ii	PUS	St. N	A9	Mopan-Pusilha	?	(Prager 2002a, III: fig. 14)
K'UH=HUL ?-AJAW	*k'uh-u[l] ? ajw*	1ATTR	1.e.iv	SBL	St. 9	D4-E4	Pasion	10.01	(Graham 1996: 29)
K'UH=HUL SEIBAL-AJAW	*k'uh-u[l] seibal ajw*	1ATTR	1.e.iv	SBL	St. 8	C2a	Pasion	10.01	(Graham 1996: 27)
K'UH=HUL SEIBAL-AJAW	*k'uh-u[l] seibal ajw*	1ATTR	1.e.iv	SBL	St. 9	D2-E2	Pasion	10.01	(Graham 1996: 29)
K'UH=HUL SEIBAL-AJAW	*k'uh-u[l] seibal ajw*	1ATTR	1.e.iv	SBL	St. 11	E1	Pasion	10.00	(Graham 1996: 34)
K'UH=JUL AJAW-wa	*k'uh-ul*	1ATTR	1.e.iv	SCU	St. 9	F1	Mopan-Pusilha	09.18	(Laporte et al. 2006: fig. 12)
u=K'UH-hu=lu	*u-k'uh-ul*	1ATTR	1.a.i	TNA	Mon. 165	N1	Chiapas	09.14	(Graham and Henderson 2006: 107)
u=K'UH-hu=lu TZAK	*u-k'uh-ul-Ø tzak*	1ATTR	1.a.i	YAX	Lnt. 42	E3-F3	Usumacinta	09.16	(Graham 1979: 93)
u=K'UH-ju=lu tza-ku	*u-k'uh-ul-Ø tzak*	1ATTR	1.a.i	YAX	Lnt. 25	E1	Usumacinta	09.14	(Graham and von Euw 1977: 55)
K'U'=lu	*k'u'-[u]l*	1ATTR	2.e.i	YUL	Lnt. 2	E1	Yucatan	10.02	(Love 1989a: fig. 3)
K'U'=u-lu	*k'u'-ul*	1ATTR	1.e.i	YUL	Lnt. 1	C2	Yucatan	10.02	(Love 1989a: fig. 2)
K'U'=u-lu	*k'u'-ul*	1ATTR	1.e.i	YUL	Lnt. 1	C5	Yucatan	10.02	(Love 1989a: fig. 2)
K'U'=u-lu	*k'u'-ul*	1ATTR	1.e.i	YUL	Lnt. 2	A7	Yucatan	10.02	(Love 1989a: fig. 3)
K'U'=u-lu	*k'u'-ul*	1ATTR	1.e.i	YUL	Lnt. 2	E4	Yucatan	10.02	(Love 1989a: fig. 3)
K'U'=u-lu	*k'u'-ul*	1ATTR	1.e.i	YUL	Lnt. 2	G7	Yucatan	10.02	(Love 1989a: fig. 3)

k'ux – VER.TR.R: "to consume"

k'u-xa=ja	*k'u<h>x-aj-Ø*	1PASS	1.b.i	NAR	HS. 1 VI	L2b	Mopan-Pusilha	09.10	(Graham 1978: 109)
k'u-xa=ja	*k'u<h>x-aj-Ø*	1PASS	1.b.i	NAR	Frg. 1	pB3	Mopan-Pusilha	09.09	(Tokovinine 2007: fig. 5)
k'u-xa=ji=ya	*k'u<h>x-j-Ø=iy*	1PASS	2.f.ii	TNA	Frg. 1	A1	Chiapas	09.16	(Graham and Henderson 2006: 122)

laj – VER.TR.R: "to pat, to clap"

u=la-ja=ba	*u-laj-ab-Ø*	3INSTR	1.a.i	PNG	Drum		Usumacinta	09.15	(Houston, Taube and Stuart 2006: 263)

lak – VER.TR.R: "to bind / to grasp"

ko=bu=yi	*[la]k-b-uy-i-Ø*	2MED	4.a.i	PAL	TS	I1	Tabasco	09.12	(Robertson 1991: fig. 95)
la-ko=bu=yi	*lak-b-uy-i-Ø*	2MED	4.a.i	PAL	TS	P16	Tabasco	09.12	(Robertson 1991: fig. 95)

lam – VER.TR.R: "to diminish"

TAN=LAM=ja	*tan la<h>m-[a]j-Ø*	1PASS	2.e.i	QRG	St. F	A16b	Motagua	09.16	(Looper 2003: fig. 4.6)
TAN=LAM=ja	*tan la<h>m-[a]j-Ø*	1PASS	2.e.i	TIK	St. 31	A13	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
TAN=LAM=ja	*tan la<h>m-[a]j-Ø*	1PASS	2.e.i	TIK	St. 31	F24	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
TAN=LAM=ja	*tan la<h>m-[a]j-Ø*	1PASS	2.e.i	TIK	St. 31	H7	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	AGT	St. 1	D2a	Pasion	09.15	(Graham 1967: fig. 3)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	ARE	St. 1	A2	Central Peten	09.18	(Grube 2008: fig. 8.4)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	CKL	Mon. 9	A5	Chiapas	09.14	(Navarrete 1984: fig. 37)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	CKL	Frg. C	A2a	Chiapas	09.14	(Navarrete 2001: 15)

LAM EK'	*lam[-aw] ek'*	2ANTIP	2.g.ii	CKL	Mon. 1	C1	Chiapas	10.00	(Navarrete 1984: fig. 10)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	CRC	St. 3	D15a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	CRC	Alt. 12	H3	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	CRC	Alt. 23	B2	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 4)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	CRC	BCm. 4	E3	Mopan-Pusilha	09.18	(Grube and Martin 2004: 75)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	CRC	St. 6	C18	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 7)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	CRC	St. 11	D4	Mopan-Pusilha	09.18	(Chase and Chase 1987: fig. 71a)
TAN$^{\text{na}}$=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	CRN	P. 1	V1-U2	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
LAM=wa	*lam-[a]w-Ø*	2ANTIP	2.e.i	DBC	St. 9	C1	Yucatan	10.00	(Grube, Lacadena and Martin 2003: 35)
ti TAN=LAM=wa	*ti tan lam-[a]w-Ø-Ø*	2ANTIP	2.e.i	DPL	St. 15	B6	Pasion	09.14	(Houston 1993: fig. 3.25)
LAM=wa	*lam-[a]w-Ø*	2ANTIP	2.e.i	EDZ	HS. 1	8	Yucatan	09.10	(Mayer 2004: 16)
TAN$^{\text{na}}$=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	IXL	Alt. 1	B2	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 81c)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	MQL	St. 2	B3	Southern Peten	09.18	(Graham 1967: fig. 44)
LAM=wa	*lam-[a]w-Ø*	2ANTIP	2.e.i	MRL	Alt. 2	7	Tabasco	09.13	(Pavón n.p.)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	MTL	K1728	Q1	Central Peten	09.16	(Kerr 1989: 105)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	MTL	K3054	I1-J1	Central Peten	09.16	(Persis Clarkson n.p.)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	MTL	K5418	F1	Central Peten	09.16	(Justin Kerr n.p.)
K'INICH LAM EK'	*k'inich lam[-aw]-Ø ek'*	2ANTIP	2.g.ii	RAZ	K5022	B4	Central Peten	?	(Kerr and Kerr 1997: 736)
K'INICH$^{\text{ni}}$ la-ma=wa EK'	*k'inich lam-aw-Ø ek'*	2ANTIP	1.a.i	RAZ	K7720	B1-B2	Central Peten	?	(Kerr and Kerr 2000: 1004)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	TAM	HS. 2 IV	H1	Pasion	09.16	(Gronemeyer 2013: pl. 31)
TAN=LAM=wa	*tan lam-[a]w-Ø*	2ANTIP	2.e.i	TNA	Mon. 104	F1	Chiapas	10.00	(Graham and Mathews 1996: 127)
u-LAM=wa	*u-lam-a-Ø*	2IND	2.e.i	MQL	St. 2	K5b	Southern Peten	09.18	(Graham 1967: fig. 47)

loch – VER.TR.R: “to bend”

lo-che=le	*lo<h>ch-el*	3NMLS	1.b.i	PAL	T18S	H7	Tabasco	09.14	(Schele and Mathews 1979: no. 443)

lok' – VER.TR.R: “to remove”

i LOK'=yi	*i['] lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 C III	F1a	Pasion	09.12	(Fahsen 2002: fig. 6)
LOK'=yi=ya	*lok'-y-Ø=iy*	2MED	2.f.ii	BPK	ScS. 5	E6b	Usumacinta	09.16	(Alexandre Safronov n.p.)
$^{\text{lo}}$LOK'=ya tu CHAN CH'EN$^{\text{na}}$	*lok'-[o]y-Ø t-u ch'en*	2MED	2.e.ii	BPK	ScS. 4	D4	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
$^{\text{lo}}$LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	C Dr.	70	C15	Yucatan	11.04	(Anders and Deckert 1975: 70)
$^{\text{lo}}$LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	C Dr.	73a	E3	Yucatan	11.04	(Anders and Deckert 1975: 73)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	COL	K8622	U2	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	CRN	HS. 3 III	B2	Central Peten	09.13	(Mayer 1989: pl. 102)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	CRN	P. 1	P3	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	CRN	HS. 2 XXX	B3	Central Peten	09.12	(David Stuart n.p.)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 E IV	D2b	Pasion	09.12	(Fahsen 2002: fig. 7)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W IV	D1a	Pasion	09.12	(Fahsen 2002: fig. 8)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W VI	E1a	Pasion	09.12	(Fahsen 2002: fig. 8)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W V	E2a	Pasion	09.12	(Fahsen 2002: fig. 8)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	DPL	HS. 4 III	J1	Pasion	09.12	(Houston 1993: fig. 4.11)

LOK'=yi=ya	*lok'-y-Ø=iy*	2MED	2.f.ii	DPL	HS. 2 E V	E1b	Pasion	09.12	(Fahsen 2002: fig. 7)
i LOK'=yi	*i['] lok'-[o]y-i-Ø*	2MED	2.e.ii	NAR	St. 23	F12	Central Peten	09.14	(Graham and von Euw 1975: 60)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	NAR	St. 1	A3	Central Peten	09.13	(Graham and von Euw 1975: 11)
i LOK'=yi	*i['] lok'-[o]y-i-Ø*	2MED	2.e.ii	SDM	Dwg. 1	B3	Mopan-Pusilha	?	(Brady and Fahsen 1991: 55)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	SDM	Dwg. 1	A3	Mopan-Pusilha	?	(Brady and Fahsen 1991: 55)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	TAM	HS. 2 III	F1	Pasion	09.16	(Gronemeyer 2013: pl. 31)
LOK'=yi	*lok'-[o]y-i-Ø*	2MED	2.e.ii	TIK	MT 178	A3	Central Peten	09.16	(Moholy-Nagy 2008: fig. 184a)
u=lo-k'o=la	*u-lok'-ol-Ø*	3NMLS	1.a.ii	CPN	St. 11	Bp5	Motagua	09.19	(Schele 1989c: fig. 1)

lum – NOUN: "dirt, soil"

lu-mi=li pi-tzi=la	*lum-il pitz-il*	1ATTR	1.d.i	COL	K7749	B1-C1	?	?	(Kerr and Kerr 2000: 1006)

mach – VER.TR.R: "to grasp, to take"

ma-cha=ja	*ma<h>ch-aj-Ø*	1PASS	1.a.i	COL	K1250	B1	Pasion	?	(Schele and Miller 1986: pl. 116a)
ma-cha=ja	*ma<h>ch-aj-Ø*	1PASS	1.a.i	PAL	TI-E	M3	Tabasco	09.12	(Robertson 1983b: fig. 95)
ma-cha=ja	*ma<h>ch-aj-Ø*	1PASS	1.a.i	NAR	K1398	T1	Central Peten	09.13	(Kerr 1989: 81)

ma[h]n – VER.TR.D: "to lend"

ma=bi	*ma[hn]-[i]b*	3INSTR	4.a.i	CPN	Alt. G	C1b	Motagua	09.18	(Schele 1987g: fig. 2)
u=ma=ba	*u-ma[hn]-[i]b*	3INSTR	4.a.i	CHN	TFL-L2	F4	Yucatan	10.02	(Krochock 1989: fig. 5)
u=ma=ba	*u-ma[hn]-[i]b*	3INSTR	4.a.i	LAC	P. 1	C6	Usumacinta	09.15	(Schaffer 1991: fig. 4)

mak – NOUN: "covering, closure"

CH'AK-ka=ma-ka=la=TE'	*ch'ak-Ø-mak-al-te'-Ø*	1ATTR	1.a.i	CRC	Alt. 13	21	Mopan-Pusilha	09.19	(Grube and Martin 2004: 85)
ma-ka=la TE'	*mak-al te'*	1ATTR	1.a.i	CRC	Alt. 13	F3	Mopan-Pusilha	09.19	(Grube and Martin 2004: 85)

mak – VER.TR.R: "to cover, to close"

ma-AK=ja	*ma<h>k-[a]j-Ø*	1PASS	2.e.i	PAL	TABL	A2	Tabasco	09.11	(Schele and Mathews 1979: no. 36)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	BCN	Cst. 1	B2	Central Campeche	09.14	(Mathews 1993: fig. 1)
ma-ka	*ma<h>k-a[j]-Ø*	1PASS	1.g.i	CPN	St. J	E 29b	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	CRC	Str. L3 2nd Cst.	B3	Mopan-Pusilha	09.09	(Chase and Chase 1987: fig. 37)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	CRN	St. 1	pC7a	Central Peten	09.13	(Canuto et al. 2008: fig. 2.10)
ma-ka	*ma<h>k-a[j]-Ø*	1PASS	1.g.i	EKB	Cst. 18	B1	Yucatan	09.18	(Lacadena 2002: fig. 16)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 1	B1	Yucatan	10.00	(Lacadena 2002: fig. 6)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 2	A2	Yucatan	10.00	(Lacadena 2002: fig. 7)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 3	A3	Yucatan	10.00	(Lacadena 2002: fig. 8)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 4	A3	Yucatan	10.00	(Lacadena 2002: fig. 9)

ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 6	A5-B1a	Yucatan	09.17	(Lacadena 2002: fig. 10)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 7	A4	Yucatan	09.17	(Lacadena 2002: fig. 11)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 10	A3	Yucatan	10.00	(Lacadena 2002: fig. 13)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 14	A5	Yucatan	09.17	(Lacadena 2002: fig. 14)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	EKB	Cst. 19	A5	Yucatan	09.18	(Lacadena 2002: fig. 17)
ma-AK=ja=ji=ya	*ma<h>k-[a]j-Ø=[i]j=iy*	1PASS	2.e.i	PNG	St. 8	B19	Usumacinta	09.14	(Stuart and Graham 2003: 46)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	PNG	St. 1	J2	Usumacinta	09.13	(Stuart and Graham 2003: 18)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	PNG	Shl. J-5	E3	Usumacinta	09.14	(Stuart 1985b: fig. 1)
ma-ka=ja	*ma<h>k-aj-Ø*	1PASS	1.a.i	YAX	HS. 2 VIII	C3	Usumacinta	09.15	(Graham 1979: 162)
u=ma-ka=wa	*u-mak-a-Ø*	2IND	1.a.i	MQL	St. 5	A3	Southern Peten	10.00	(Graham 1967: fig. 53)
u=ma-ka=wa	*u-mak-a-Ø*	2IND	1.a.i	MQL	St. 7	C1a	Southern Peten	10.00	(Graham 1967: fig. 57)
u=ma-ka=wa	*u-mak-a-Ø*	2IND	1.a.i	MQL	St. 8	B2a	Southern Peten	09.19	(Graham 1967: fig. 59)

mak' – VER.TR.R: "to eat soft stuff"

ma-k'a=ba=ja	*mak'-b-aj-Ø te'*	1INCH	1.f.ii	PAL	PMI1	D4b	Tabasco	09.14	(Linda Schele SD 111)
ma-k'a=wa	*mak'-aw-Ø*	2ANTIP	1.a.i	C Dr.	14b	A1	Yucatan	11.04	(Anders and Deckert 1975: 14)
ma-k'a=wa	*mak'-aw-Ø*	2ANTIP	1.a.i	C Dr.	14b	C1	Yucatan	11.04	(Anders and Deckert 1975: 14)
ma-k'a=wa	*mak'-aw-Ø*	2ANTIP	1.a.i	C Dr.	14b	E1	Yucatan	11.04	(Anders and Deckert 1975: 14)
ma-k'a=wa	*mak'-aw-Ø*	2ANTIP	1.a.i	C Dr.	15c	A1	Yucatan	11.04	(Anders and Deckert 1975: 15)
u=ma-k'a	*u-mak'-a-Ø*	2IND	1.g.i	C Dr.	13b	A1	Yucatan	11.04	(Anders and Deckert 1975: 13)
u=ma-k'a	*u-mak'-a-Ø*	2IND	1.g.i	C Dr.	13b	C1	Yucatan	11.04	(Anders and Deckert 1975: 13)
u=ma-k'a	*u-mak'-a-Ø*	2IND	1.g.i	C Dr.	13b	E1	Yucatan	11.04	(Anders and Deckert 1975: 13)
u=ma-k'a	*u-mak'-a-Ø*	2IND	1.g.i	C Dr.	15c	C1	Yucatan	11.04	(Anders and Deckert 1975: 15)

may-i – VER.TR.D: "to offer"

u=MAY=ji	*u-may-[i]j-Ø*	4TEMP	2.e.i	CML	U. 26 Pdt. 17	A6a	Tabasco	09.17	(Marc Zender n.p.)
u=MAY=ji	*u-may-[i]j-Ø*	4TEMP	2.e.i	CML	U. 26 Pdt. 18	A7	Tabasco	09.17	(Marc Zender n.p.)
u=MAY-yi=ji	*u-may-ij-Ø*	4TEMP	1.b.i	PAL	PT	G14	Tabasco	09.14	(Robertson 1985b: fig. 258)
u=ma-yi=ji	*u-may-ij-Ø*	4TEMP	1.b.i	TRT	Bx. 1	S4	Tabasco	09.12	(Gronemeyer 2006b: pl. 2)
u=MAY=ji	*u-may-[i]j-Ø*	4TEMP	2.e.i	YAX	Bur. 3 Bone	B1	Usumacinta	09.15	n/a

mek' – VER.TR.R: "to embrace"

u=me-k'e=ji=ya	*u-mek'-j-Ø=iy*	4TEMP	2.f.ii	CPN	St. A	B7b	Motagua	09.14	(Alexander 1988: fig. 1)
u=me-k'e=ji=ya	*u-mek'-j-Ø=iy*	4TEMP	2.f.ii	PAL	96G	E6	Tabasco	09.17	(Robertson 1991: fig. 265)

met – VER.TR.R: "to put on another"

me-ta=ja	*me<h>t-aj-Ø*	1POS	1.b.i	TIK	Marcador	G9	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)

mob – VER.TR.R

mo-ba=ja	*mo<h>b-aj-Ø*	1PASS	1.b.i	CRC	Alt. 12	D1	Mopan-Pusilha	09.19	(Grube and Martin 2004: 83)

mol – VER.TR.R: "to join, to gather"

mo-lo	*mol-o[w]-Ø*	2ANTIP	1.g.i	C Dr.	10c	A1	Yucatan	11.04	(Anders and Deckert 1975: 10)
u=mo-lo	*u-mol-o-Ø*	2IND	1.g.i	C Dr.	10c	C1	Yucatan	11.04	(Anders and Deckert 1975: 10)
u=mo-lo	*u-mol-o-Ø*	2IND	1.g.i	C Dr.	10c	E1	Yucatan	11.04	(Anders and Deckert 1975: 10)
u=mo-lo	*u-mol-o-Ø*	2IND	1.g.i	C Dr.	11c	A1	Yucatan	11.04	(Anders and Deckert 1975: 11)
u=mo-lo	*u-mol-o-Ø*	2IND	1.g.i	C Dr.	11c	C1	Yucatan	11.04	(Anders and Deckert 1975: 11)
u=mo-lo	*u-mol-o-Ø*	2IND	1.g.i	C Dr.	11c	E1	Yucatan	11.04	(Anders and Deckert 1975: 11)

motz – NOUN: "root"

mo-tzo=ma-ye=se	*motz-m-ay-es-Ø*	1INCH	1.f.iii	TRT	Mon. 8	A19	Tabasco	09.10	(Gronemeyer 2006b: pl. 14)
IX YAX MOTZ?=yi	*ix yax motz?-[i]y-i-Ø*	2INCH	4.a.i	PAL	PT	D15	Tabasco	09.14	(Robertson 1985b: fig. 258)
MOTZ?=yi	*motz-[i]y-i-Ø*	2INCH	4.a.i	TRT	Mon. 6	L5	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
IX MOTZ?=yi	*ix motz?-[i]y-i-Ø*	2INCH	4.a.i	YAX	St. 7	pD6	Usumacinta	09.17	(Tate 1992: fig. 89)

muk – VER.TR.R: "to bury"

mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.b.i	DPL	St. 8	H14	Pasion	09.14	(Houston 1993: fig. 4.14)
mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.b.i	PNG	P. 3	V5	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.a.i	RAZ	Bur. 12	C1	Central Peten	09.03	(Adams 1999: fig. 3.16)
mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.b.i	TIK	Alt. 5	17	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 23)
mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.b.i	PAL	T18S	F8	Tabasco	09.14	(Schele and Mathews 1979: no. 471)
mu-ka=ja	*mu<h>k-aj-Ø*	1PASS	1.b.i	PAL	PMI1	E8a	Tabasco	09.13	(Linda Schele SD 112)
mu-ku=ja	*mu<h>k-[a]j-Ø*	1PASS	2.a.i	CAY	Lnt. 1	C13	Usumacinta	09.17	(John Montgomery n.p.)
mu-ku=ja=ya	*mu<h>k-j-Ø=[i]y*	1PASS	2.f.ii	PNG	P. 12	O4	Usumacinta	09.04	(Teufel 2004: 515)
mu=ja	*mu<h>[k]-[a]j-Ø*	1PASS	2.g.i	QRG	Zoo. G	J'1b	Motagua	09.17	(Looper 2001: fig. 3)
u=mu-ku	*u-muk-u-Ø*	2IND	1.g.i	C Ma.	109b	D1	Yucatan	11.11	(Anders 1967: 109)
u=mu-ku	*u-muk-u-Ø*	2IND	1.g.i	C Ma.	109b	F1	Yucatan	11.11	(Anders 1967: 109)
u=mu-ku	*u-muk-u-Ø*	2IND	1.g.i	C Ma.	110b	B1	Yucatan	11.11	(Anders 1967: 109)
mu-ku=yi	*muk-uy-i-Ø*	2MED	1.a.ii	BLK	St. 5	D5	Central Peten	08.18	(Grube 2008: fig. 8.6)
mu-ku=yi	*muk-uy-i-Ø*	2MED	1.a.ii	CLK	Frg. 19	2	Central Campeche	09.16	(Simon Martin n.p.)
mu-ku=yi	*muk-uy-i-Ø*	2MED	1.a.ii	CLK	Frg. 1	B1	Central Campeche	09.16	(Simon Martin n.p.)

nab – VER.TR.R: "to paint"

na-ba=ja	*na<h>b-aj-Ø*	1PASS	1.a.i	ALS	St. 4	C2	Pasion	09.10	(Eberl 2007: fig. A2.1)
na-ba=ja	*na<h>b-aj-Ø*	1PASS	1.a.i	ALS	St. 4	C10	Pasion	09.10	(Eberl 2007: fig. A2.1)

nah – NOUN: “house”

NAH^{hi}=ja	*nah-[a]j*	1ABSL	2.c.i	TRT	Mon. 6	J6	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
yo-? na=ja	*y-? na[h]-aj*	1ABSL	4.a.iv	CPN	T. 11 SDWP	A2-B2	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 7)

na[h]b – NOUN: “pool, lake”

NAB=ja CH'ICH'	*na[h]b-[a]j-Ø ch'ich'*	1INCH	2.e.i	TRT	Mon. 6	G6	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
NAB=ja u=CH'ICH'=le	*na[h]b-[a]j-Ø u-ch'ich'-[e]l*	1INCH	2.e.i	DPL	HS. 2 W III	D1	Pasion	09.12	(Fahsen 2002: fig. 8)

naj – ADJ: “full, satisfied”

na-ja=yi	*naj-ay-i-Ø*	2INCH	1.a.ii	PAL	T18S	158	Tabasco	09.14	(Schele and Mathews 1979: no. 498)

nak – VER.TR.R: “to conquer”

u=na-ka=wa	*u-nak-a-Ø*	2IND	1.a.i	DPL	HS. 2 E II	C1	Pasion	09.12	(Fahsen 2002: fig. 7)

nak'– NOUN: “belly, stomach”

na-k'a=la	*nak'-al*	1ATTR	1.a.i	PAL	TI-W	Q5	Tabasco	09.12	(Robertson 1983b: fig. 97)

naw– VER.TR.R: “to reveal”

na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	AGT	St. 2	E2	Pasion	09.15	(Graham 1967: fig. 5)
i na-wa=ja	*i['] na<h>w-aj-Ø*	1PASS	1.a.i	DPL	HS. 2 C I	D2	Pasion	09.12	(Fahsen 2002: fig. 6)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	COL	Lnt. 1 Site N	D1	Usumacinta	09.16	(Mayer 1987: pl. 74)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	COL	Alt. Maegli	G4a	?	?	(Mayer 1991: pl. 98)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	DPL	St. 15	C2	Pasion	09.14	(Houston 1993: fig. 3.25)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	DPL	St. 16	E1	Pasion	09.15	(Stephen Houston n.p.)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	EDZ	St. 20	A3	Yucatan	09.11	(Carlos Pallán n.p.)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	LTI	P. 1	B4	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
NAH-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PAL	T18S	A5	Tabasco	09.14	(Schele and Mathews 1979: no. 446)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PAL	SCR	A3	Tabasco	09.15	(Schele and Mathews 1979: no. 142)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PAL	T18S	A8	Tabasco	09.14	(Schele and Mathews 1979: no. 418)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PAL	HAWF	A3a	Tabasco	09.11	(Robertson 1985b: fig. 289)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PAL	HAWF	B3a	Tabasco	09.11	(Robertson 1985b: fig. 289)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	St. 1	K5	Usumacinta	09.13	(Stuart and Graham 2003: 18)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	St. 3	D2b	Usumacinta	09.14	(Stuart and Graham 2003: 26)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	St. 8	C2	Usumacinta	09.14	(Stuart and Graham 2003: 44)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	P. US Collection	A2	Usumacinta	09.12	(Mayer 1989: pl. 103)
na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	Shl. J-5	I2	Usumacinta	09.14	(Stuart 1985b: fig. 1)

na-wa=ja	*na<h>w-aj-Ø*	1PASS	1.a.i	PNG	Shl. J-5	L2a	Usumacinta	09.14	(Stuart 1985b: fig. 1)
ma u=na-wa=ji	*ma['] u-naw-aj-Ø*	4TEMP	1.a.ii	PAL	TI-E	O10	Tabasco	09.12	(Robertson 1983b: fig. 95)

nuch – VER.TR.R: "to put together"

nu-chu	*nuch-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	8b	A1	Yucatan	11.04	(Anders and Deckert 1975: 8)
nu-chu	*nuch-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	8b	D1	Yucatan	11.04	(Anders and Deckert 1975: 8)
u=nu-chu	*u-nuch-u-Ø*	2IND	1.g.i	C Dr.	9b	A1	Yucatan	11.04	(Anders and Deckert 1975: 9)
u=nu-chu	*u-nuch-u-Ø*	2IND	1.g.i	C Dr.	9b	D1	Yucatan	11.04	(Anders and Deckert 1975: 9)

nup – VER.TR.R: "to join"

nu-pa=ja	*nu<h>p-aj-Ø*	1PASS	1.b.i	BPK	St. 2	B5	Usumacinta	09.17	(Mathews 1980: fig. 2)
u=nu-pu=ji	*u-nup-uj-Ø*	4TEMP	1.a.ii	COL	Shl. Taylor Limpet	L1a	?	09.18	(Guido Krempel n.p.)
nu-pa=ja	*nu<h>p-aj-Ø*	1PASS	1.b.i	TIK	T. 4 Lnt. 3	D5	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
nu-pu-TE'=ja	*nup-Ø-te'-[a]j-Ø*	1INCH	2.e.i	TRT	Mon. 6	F10	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)

och – VER.INTR: "to enter"

OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	BPK	ScS. 4	H1	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	CNC	P. 1	B5	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	CNK	Trn. 2	D1	Tabasco	09.16	(Teobert Maler n.p.)
i OCH=BIH=ja	*i['] och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	CRN	P. 2	I7	Central Peten	09.12	(Mayer 1995: pl. 161)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	MTL	K6547	G1	Central Peten	?	(Kerr and Kerr 2000: 972)
OCH=HA'=AJ	*och-Ø-ha'-aj-Ø*	1INCH	1.e.iv	MTL	K1004	T3	Central Peten	09.15	(Robicsek and Hales 1982: #186)
i OCH=BIH=ja	*i['] och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	PAL	PT	N7	Tabasco	09.14	(Robertson 1985b: fig. 258)
i OCH=BIH=ja	*i['] och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	PAL	T18S	B6	Tabasco	09.14	(Schele and Mathews 1979: no. 485)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	PAL	T18S	B7	Tabasco	09.14	(Schele and Mathews 1979: no. 462)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	PAL	HCWF	G2	Tabasco	09.11	(Robertson 1985b: fig. 374)
OCH=ja	*och-Ø-[a]j-Ø*	1INCH	4.a.i	PAL	PMI1	F7a	Tabasco	09.13	(Linda Schele SD 112)
OCH=OTOT=ja	*och-Ø-otot-[a]j-Ø*	1INCH	2.e.i	PAL	TFCB	G1	Tabasco	09.12	(Schele and Freidel 1990: 249)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	PMT	Alt. 3	pA2	Tabasco	09.13	(Peter Mathews n.p.)
OCH=BIH-hi=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.a.i	PNG	St. 8	F2	Usumacinta	09.14	(Stuart and Graham 2003: 44)
OCH=HA'=ja	*och-Ø-ha'-[a]j-Ø*	1INCH	2.e.i	RAZ	Jd. Celt 1	B9	Central Peten	09.00	(Grube and Martin 2001: 48)
i OCH=WITZ=ja	*i['] och-Ø-witz-[a]j-Ø*	1INCH	2.e.i	TIK	St. 31	C26	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
OCH=BIH=ja	*och-Ø-bih-[a]j-Ø*	1INCH	2.e.i	TIK	St. 31	G28	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
OCH=HA'=ja	*och-Ø-ha'-[a]j-Ø*	1INCH	2.e.i	TIK	St. 31	D23	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
OCH=BIH=ji=ji=ya	*och-Ø-bih-[a]j-Ø=ijiy*	1INCH	2.f.ii	TRT	Bx. 1	F2	Tabasco	09.12	(Gronemeyer 2006b: pl. 1)
OCH=lo=la	*och-[o]l-[a]l*	3NMLS	3.a.i	C Pa.	3b	D2	Yucatan	10.18	(Anders 1968: 3)
yo=che=la	*y-och-el*	3NMLS	1.d.ii	TIK	MT. 176	T2	Central Peten	09.16	(Culbert 1993: fig. 84)

ok – NOUN: "foot"

i OK=ja	*i['] ok-[a]j-Ø*	1INCH	2.e.i	PAL	TS	Q13	Tabasco	09.12	(Robertson 1991: fig. 95)
o-ke=ja	*ok-[a]j-Ø*	1INCH	2.c.i	TNA	Mon. 146	H1	Chiapas	09.17	(Graham and Henderson 2006: 79)
ta OK=le	*ta ok-[e]l*	1POSS	2.e.i	PAL	TFC	G2	Tabasco	09.12	(Robertson 1991: fig. 153)
u=yo=OK=le TE'	*u-y-ok-[e]l te'*	1POSS	2.e.i	YAX	Lnt. 25	I2	Usumacinta	09.14	(Graham and von Euw 1977: 55)
?-o-ki=bi	*?-ok-ib*	3INSTR	1.b.i	PAL	T18S	280d	Tabasco	09.14	(Schele and Mathews 1979: no. 476)
o-ki=bi	*ok-ib*	3INSTR	1.b.i	PAL	T19B-S	M7	Tabasco	09.15	(Stuart 2005b: pl. 2)
o-ki=bi	*ok-ib*	3INSTR	1.b.i	PAL	T19B-W	L1	Tabasco	09.15	(Stuart 2005b: pl. 1)
yo=ko=bi=li	*y-ok-b-il*	3INSTR	2.b.i	PAL	T19B-W	A3	Tabasco	09.15	(Stuart 2005b: pl. 1)
yo=ko=bi=li	*y-ok-b-il*	3INSTR	2.b.i	PAL	T19B-W	G5	Tabasco	09.15	(Stuart 2005b: pl. 1)
yo=ko=bi=li	*y-ok-b-il*	3INSTR	2.b.i	PAL	T21B-E	25	Tabasco	09.15	(Stuart 2006b: 185-186)
o-ki=bi	*ok-ib*	3INSTR	1.b.i	PAL	T21B-E	32	Tabasco	09.15	(Stuart 2006b: 185-186)
o-ki=bi	*ok-ib*	3INSTR	1.b.i	PAL	T21B-P	F2	Tabasco	09.15	(Stuart 2006b: 187)
o-ki=bi	*ok-ib*	3INSTR	1.b.i	PAL	T21B-P	I1	Tabasco	09.15	(Stuart 2006b: 187)

otot – NOUN: "house"

NAH OTOT=ja	*nah otot-[a]j-Ø*	1INCH	2.e.i	PAL	NGJ2	H4	Tabasco	09.11	(Schele and Mathews 1979: no. 40)

pak' – VER.TR.R: "to form"

pa-k'a=ja	*pa<h>k'-aj-Ø*	1PASS	1.a.i	COL	K7447	A3	?	?	(Justin Kerr n.p.)
pa-k'a=ja	*pa<h>k'-aj-Ø*	1PASS	1.a.i	COL	K7447	B3	?	?	(Justin Kerr n.p.)
pa-k'a=ji=ya	*pa<h>k'-j-Ø=iy*	1PASS	2.f.ii	CPN	Alt. F'	A2a	Motagua	09.18	(MacLeod 1989: fig. 1)
u-pa-k'a=wa	*u-pak'-a-Ø*	2IND	1.a.i	COL	K717	A3	?	?	(Kerr 1989: 39)
u-pa-k'a=wa	*u-pak'-a-Ø*	2IND	1.a.i	COL	K8457	O2	?	?	(Justin Kerr n.p.)

pak' – VER.TR.R: "to plant"

u=pa-k'a	*u-pak'-a-Ø*	2IND	1.g.i	C Ma.	101d	A1	Yucatan	11.11	(Anders 1967: 101)
u=pa-k'a	*u-pak'-a-Ø*	2IND	1.g.i	C Ma.	101d	D1	Yucatan	11.11	(Anders 1967: 101)

palaw ~ polaw – NOUN: "ocean"

3=PALAW-wa=ja	*3 palaw-aj-Ø*	1INCH	1.a.i	PAL	T19B-S	F4	Tabasco	09.15	(Stuart 2005b: pl. 2)
na-ka=PALAW-wa=AJ	*nak-Ø-palaw-aj-Ø*	1INCH	1.e.iii	PAL	T19B-S	F5	Tabasco	09.15	(Stuart 2005b: pl. 2)

pas – VER.T.R: "to open, to dawn"

pa-sa=ja	*pa<h>s-aj-Ø*	1PASS	1.a.i	CML	U. 26 Sp. 1	A3	Tabasco	09.17	(Marc Zender n.p.)
YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	Alt. 8	E1	Motagua	09.17	(Maudslay 1974, I: pl. 112)

YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	Alt. L	D1	Motagua	09.19	(Baudez 1994)
YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	Alt. Q	F3	Motagua	09.17	(Schele 1989a: fig. 1)
YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	Alt. U	C3	Motagua	09.18	(Schele and Stuart 1986b: fig. 1)
YAX PAS CHAN	*yax pa<h>s[-aj]-Ø chan*	1PASS	2.g.ii	CPN	Alt. G	B4	Motagua	09.18	(Schele 1987g: fig. 2)
YAX PAS CHAN[na]	*yax pa<h>s[-aj]-Ø chan*	1PASS	2.g.ii	CPN	Alt. R	K2a	Motagua	09.17	(Maudslay 1974, I: pl. 94)
YAX pa-sa=ja	*yax pa<h>s-aj-Ø*	1PASS	1.a.i	CPN	K4655	M1-N1	Motagua	09.17	(Linda Schele SD 1041)
YAX pa-sa=ja	*yax pa<h>s-aj-Ø*	1PASS	1.a.i	CPN	K3296	C2-C3	Motagua	09.18	(Kerr 1992: 403)
i pa-sa=ja	*i['] pa<h>s-aj-Ø*	1PASS	1.a.i	CPN	St. M	B9a	Motagua	09.16	(Maudslay 1974, I: pl. 74)
YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	St. 8	D2b	Motagua	09.17	(Maudslay 1974, I: pl. 109)
YAX PAS	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	St. 11	Bp7	Motagua	09.19	(Schele 1989c: fig. 1)
pa-sa	*pa<h>s-a[j]-Ø*	1PASS	1.g.i	CPN	St. J	E 29b	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
YAX PAS-sa=ja CHAN	*yax pa<h>s[-aj]-Ø chan*	1PASS	1.a.i	CPN	Str. 21 Hbh.	B1-C1a	Motagua	09.16	(Linda Schele SD 1062)
YAX PAS CHAN	*yax pa<h>s[-aj]-Ø*	1PASS	2.g.ii	CPN	T. 11 SDWP	D4	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 7)
YAX PAS CHAN	*yax pa<h>s[-aj]-Ø chan*	1PASS	2.g.ii	CPN	T. 11 Hbh.	B2	Motagua	09.16	(Maudslay 1974, I: pl. 8)
YAX pa-sa CHAN[na]	*yax pa<h>s-a[j]-Ø chan*	1PASS	1.g.i	CPN	T. 11 NDEP	C3-D3	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 1)
YAX pa-sa=ja CHAN[na]	*yax pa<h>s-aj-Ø chan*	1PASS	1.a.i	CPN	T. 11 East Facade	A2-A3	Motagua	09.17	(Maudslay 1974, I: pl. 7c)
YAX PAS-sa=ja	*yax pa<h>s-aj-Ø*	1PASS	1.a.i	CPN	T. 11 RS	F1-G1	Motagua	09.17	(Schele 1987d: fig. 1)
YAX PAS CHAN	*yax pa<h>s[-aj]-Ø chan*	1PASS	2.g.ii	CPN	T. 22a Stone	C1	Motagua	09.18	(Schele et al. 1989: fig. 29)
pa-sa=ja	*pa<h>s-aj-Ø*	1PASS	1.a.i	NAR	St. 23	F18	Central Peten	09.14	(Graham and von Euw 1975: 60)
i PAS=ja	*i['] pa<h>s-[a]j-Ø*	1PASS	2.e.i	PAL	HCHS	D3a	Tabasco	09.11	(Robertson 1985b: fig. 319)
PAS=ji=ya	*pa<h>s-j-Ø=iy*	1PASS	2.f.ii	PMT	P. 96G	A2	Tabasco	09.13	(Stuart 2007c: 64)
YAX PAS CHAN	*yax pa<h>s[-aj]-Ø chan*	1PASS	2.g.ii	QRG	Str. 1B-1	V1b	Motagua	09.19	(Schele and Looper 1996: 186)
pa-sa=ja	*pa<h>s-aj-Ø*	1PASS	1.a.i	TIK	Alt. 5	26	Central Peten	09.13	(Jones and Satterthwaite 1982: fig. 23)
PAS=wi	*pas-[a]w-Ø*	2ANTIP	2.e.ii	PMT	Jmb. 3	B6	Tabasco	09.13	(Bíró 2011a: fig. 303)
pa-sa=wa	*pas-aw-Ø*	2ANTIP	1.a.i	QRG	Mon. 26	C5	Motagua	09.02	(Looper 2003: fig. 1.7)
u=pa-sa=wa	*u-pas-a-Ø*	2IND	1.a.i	HLK	Lnt. 1	G7	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 43)

pat – POS: "shape"

PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	C Dr.	52b	B3	Yucatan	11.04	(Anders and Deckert 1975: 52)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	C Dr.	61	A8	Yucatan	11.04	(Anders and Deckert 1975: 61)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	C Dr.	61	B13	Yucatan	11.04	(Anders and Deckert 1975: 61)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	C Dr.	69	C3	Yucatan	11.04	(Anders and Deckert 1975: 69)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	C Dr.	69	D13	Yucatan	11.04	(Anders and Deckert 1975: 69)
3 pa-PAT=ja=la	*3 pa<h>t-j-al-Ø*	1PASS	2.f.ii	CRN	P. 1	E3	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	CPN	Alt. I'	K2b	Motagua	09.12	(Baudez 1994)
PAT-ta=ja	*pa<h>t-aj-Ø*	1PASS	1.a.i	CPN	Alt. H'	N1b	Motagua	09.12	(Baudez 1994)
u=PAT=na=ja	*u-pat-n-aj-Ø-Ø*	1PASS	4.a.i	CPN	St. P	C3	Motagua	09.09	(Schele and Stuart 1986a: fig. 3)
i PAT=na=ja	*i['] pat-n-aj-Ø*	1PASS	1.f.ii	PAL	TABL	L2	Tabasco	09.11	(Schele and Mathews 1979: no. 36)
PAT=ja	*pa<h>t-[a]j-Ø*	1PASS	2.e.i	PAL	TCB	K2	Tabasco	09.12	(Schele and Mathews 1979: no. 272)
i PAT=ji=ya	*i['] pat-j-Ø=iy*	1POS	2.f.ii	PNG	P. 12	D1	Usumacinta	09.04	(Teufel 2004: 515)
PAT=ja	*pat-aj-Ø*	1POS	2.e.i	TIK	St. 31	D27	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
i PAT-ta=wi	*i['] pat-aw-Ø*	2ANTIP	1.a.ii	QRG	Alt. M	A4	Motagua	09.15	(Looper 2003: fig. 2.5)

u=pa-ta	*u-pat-a-Ø*	2IND	1.g.i	CRC	Alt. 10	D1	Mopan-Pusilha	10.01	(Grube and Martin 2004: 89)
u=pa-ta=wa	*u-pat-a-Ø*	2IND	1.a.i	CRC	St. 17	A2	Mopan-Pusilha	10.01	(Martin and Grube 2000: 99)
PAT=bu=ya	*pat-b-uy-Ø*	2MED	1.f.iii	PAL	TISL	13	Tabasco	09.12	(Robertson 1983b: fig. 170)
PAT=ya	*pat-[a]y-Ø*	2MED	2.e.i	TRT	Jd. 1	A6	Tabasco	09.11	(Gronemeyer 2006b: pl. 4a)
u=PAT-ta=bu=ji	*u-pat-b-uj-Ø*	4TEMP	1.f.iii	CPN	Alt. U	J2a	Motagua	09.18	(Schele and Stuart 1986b: fig. 1)
u=PAT=bu=ji	*u-pat-b-uj-Ø*	4TEMP	1.f.iii	CPN	Mon. 50	J2a	Motagua	09.11	(Schele 1987b: fig. 3)
u=pa-ta=bu=ji	*u-pat-b-uj-Ø*	4TEMP	1.f.iii	CPN	St. 48	Ap1	Motagua	09.02	(Riese and Baudez 1983: fig. R-9)
u=PAT=bu=ji	*u-pat-b-uj-Ø*	4TEMP	1.f.iii	CRN	Msc. 06-2011/PH	B1a	Central Peten	09.12	(Boot 2011: fig. 1)

pek – VER.TR.R: “to announce”

pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	BPK	ScS. 5	M8	Usumacinta	09.16	(Alexandre Safronov n.p.)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4a	A1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4a	C1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4b	A1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4b	C1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4b	D1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4b	E1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	4b	F1	Yucatan	11.04	(Anders and Deckert 1975: 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	5a	C1	Yucatan	11.04	(Anders and Deckert 1975: 5)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	5a	E1	Yucatan	11.04	(Anders and Deckert 1975: 5)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	5b	A1	Yucatan	11.04	(Anders and Deckert 1975: 5)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	5b	B1	Yucatan	11.04	(Anders and Deckert 1975: 5)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	6a	A1	Yucatan	11.04	(Anders and Deckert 1975: 6)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	6a	C1	Yucatan	11.04	(Anders and Deckert 1975: 6)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	7a	C1	Yucatan	11.04	(Anders and Deckert 1975: 7)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	7a	E1	Yucatan	11.04	(Anders and Deckert 1975: 7)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	8a	A1	Yucatan	11.04	(Anders and Deckert 1975: 8)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	8a	C1	Yucatan	11.04	(Anders and Deckert 1975: 8)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	9a	C1	Yucatan	11.04	(Anders and Deckert 1975: 9)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	9a	E1	Yucatan	11.04	(Anders and Deckert 1975: 9)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	10a	A1	Yucatan	11.04	(Anders and Deckert 1975: 10)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	C Dr.	10a	C1	Yucatan	11.04	(Anders and Deckert 1975: 10)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	COL	P. Brussels	B5b	Usumacinta	09.13	(Bíró 2005: fig. 4)
pe-ka=ja	*pe<h>k-aj-Ø*	1PASS	1.b.i	COL	P. Brussels	A8a	Usumacinta	09.13	(Bíró 2005: fig. 4)
u=pe=ji	*u-pe[k-e]j-Ø*	4TEMP	2.g.ii	CRN	P. 1	H5	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)

pet – ADJ: “round”

PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	10b	E1	Yucatan	11.04	(Anders and Deckert 1975: 10)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	11b	A1	Yucatan	11.04	(Anders and Deckert 1975: 11)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	11b	C1	Yucatan	11.04	(Anders and Deckert 1975: 11)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	11b	E1	Yucatan	11.04	(Anders and Deckert 1975: 11)

PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	11b	F1	Yucatan	11.04	(Anders and Deckert 1975: 11)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	12b	A1	Yucatan	11.04	(Anders and Deckert 1975: 12)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	12b	C1	Yucatan	11.04	(Anders and Deckert 1975: 12)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Dr.	12b	E1	Yucatan	11.04	(Anders and Deckert 1975: 12)
pe-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Pa.	8c	F2	Yucatan	10.18	(Anders 1968: 8)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Pa.	2b	B4	Yucatan	10.18	(Anders 1968: 2)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Pa.	2b	E1	Yucatan	10.18	(Anders 1968: 2)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Pa.	8b	B6	Yucatan	10.18	(Anders 1968: 8)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	C Pa.	9b	B4	Yucatan	10.18	(Anders 1968: 9)
PET=ja	*pet-aj-Ø*	1INCH	2.e.i	CHN	ADZ-LF	B1a	Yucatan	10.02	(Graña-Behrens 2002: pl. 42)
PET=ja=la	*pet-j-al-Ø*	1INCH	2.f.ii	CHN	T4L-L2	C3	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 71)
PET=ja=la	*pet-j-al-Ø*	1INCH	2.f.ii	CHN	T4L-L3	G8	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 69)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	CNC	P. 1	M9	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	COL	K1180	A3	?	?	(Robicsek and Hales 1982: #68)
PET=ja	*pet-aj-Ø*	1INCH	2.e.i	COL	Lnt. Hekelchakan	E1	Yucatan	10.00	(Graña-Behrens 2002: pl. 205)
PET-ta	*pet-a[j]-Ø*	1INCH	1.g.i	COL	P. Maegli 3	B2a	?	09.17	(Mayer 1995: pl. 125)
pe-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	COL	Shl. Taylor Limpet	G1	?	09.18	(Guido Krempel n.p.)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	CRN	HS. 3 VI	B2	Central Peten	09.13	(Canuto et al. 2008: fig. 2.9)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	OXK	BcM	I	Yucatan	09.14	(García Campillo 1994a: fig. 2)
PET=ji=ya	*pet-j-Ø=iy*	1INCH	2.f.ii	PAL	TS	C9	Tabasco	09.12	(Robertson 1991: fig. 95)
PET=ji=ya	*pet-j-Ø=iy*	1INCH	2.f.ii	PAL	TC	D15a	Tabasco	09.12	(Robertson 1991: fig. 9)
PET=ji=ya	*pet-j-Ø=iy*	1INCH	2.f.ii	SBP	HS. 1 I	A9	Yucatan	10.01	(Grube, Pallán and Benavides 2010: pl. 1)
PET=ji=ya	*pet-j-Ø=iy*	1INCH	2.f.ii	SBP	HS. 1 II	B9	Yucatan	10.01	(Grube, Pallán and Benavides 2010: pl. 2)
PET-TE'=ja	*pet-[a]j-Ø*	1INCH	2.a.i	XCA	Jmb. 1	Ap6	Yucatan	09.14	(Graña-Behrens 2002: pl. 174)
PET-ta=ja	*pet-aj-Ø*	1INCH	1.b.i	XLM	Lnt. 1	B1	Yucatan	09.15	(Graham and von Euw 1992: 158)
PET=yi=ya	*pet-[i]y-Ø=iy*	2INCH	2.e.i	CRN	P. 1	O1	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)

pet – VER.TR.R: "to pour"

PET=ne=ib	*pet-n-[i]b-Ø*	3INSTR	2.g.i	COL	St. Médard Vase	A3-A4	?	?	(Sebastian Matteo n.p.)

pib – NOUN: "oven, grill, sweatbath"

ti pi-bi=le ti-i	*ti pib-il ti'*	1ATTR	1.a.ii	COL	K1250	A3-A4	Pasion	?	(Schele and Miller 1986: pl. 116a)
pi-ba=ya	*pib-ay-Ø*	2INCH	1.b.i	NTN	Dwg. 65	G5	Mopan-Pusilha	09.15	(MacLeod and Stone 1994: fig. 7.9)

pitz – VER.TR.R: "to play ball"

pi-tzi=la=ja	*pitz-il-aj-Ø*	1INCH	1.f.ii	CRN	HS. 2 IV	B1	Central Peten	09.14	(Mayer 1984: pl. 14)
pi-tzi=ja	*pi<h>tz-[a]j-Ø*	1PASS	2.a.i	CRN	HS. 2 IX	B4	Central Peten	09.14	(Mayer 1987: pl. 57)
pi-tzi=ja	*pi<h>tz-[a]j-Ø*	1PASS	2.a.i	CRN	HS. 2 X	A1	Central Peten	09.14	(Mayer 1987: pl. 28)
pi-tzi=ji=ya	*pi<h>tz-j-Ø=iy*	1PASS	2.f.ii	CRN	HS. 2 1-VII	Ap4	Central Peten	09.14	(David Stuart n.p.)
pi-tzi=ja	*pi<h>tz-[a]j-Ø*	1PASS	2.a.i	NAR	HS. 1 VII	O2a	Mopan-Pusilha	09.10	(Graham 1980: 109)

pi-tzi=ja	*pi<h>tz-[a]j-Ø*	1PASS	2.a.i	QRG	Str. 1B-1	C1	Motagua	09.19	(Schele and Looper 1996: fig. 186)
pi-tzi=ji=ya	*pi<h>tz-j-Ø=iy*	1PASS	2.f.ii	YAX	HS. 2 VIII	A2	Usumacinta	09.15	(Graham 1979: 162)

pop – NOUN: "mat"

^{2}po=lo	*pop-ol*	1ATTR	1.a.i	COL	Shl. Berlin	F1a	?	?	(Grube and Gaida 2006: #37)
^{2}po=lo	*pop-ol*	1ATTR	1.a.i	YAX	HS. 3 I	D6	Usumacinta	09.15	(Graham 1979: 166)
po-po=lo	*pop-ol*	1ATTR	1.a.i	YAX	HS. 3 I	E1	Usumacinta	09.15	(Graham 1979: 166)
AJ po=lo	*aj po[p]-[o]l*	1ATTR	2.g.ii	YAX	St. 18	A5	Usumacinta	09.15	(Tate 1992: fig. 145)

puk – VER.TR.R: "to scatter"

PUK=wa K'AK'	*puk-[u]w-Ø k'a[h]k'*	2ANTIP	2.e.ii	PUS	St. H	A9	Mopan-Pusilha	09.11	(Prager 2002a, III: fig. 10)
PUK=yi K'AK'	*puk-[u]y-i-Ø k'a[h]k'*	2MED	2.e.ii	UXB	St. 15	B6	Mopan-Pusilha	09.17	(Wanyerka 2003: fig. 95)
PUK=yi K'AK'	*puk-[u]y-i-Ø k'a[h]k'*	2MED	2.e.ii	NMP	St. 15	D3a	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)
PUK-ka=ja K'AK'	*pu<h>k-aj-Ø k'a[h]k'*	1PASS	1.d.i	CRN	HS. 2 XI	B4	Central Peten	09.14	(Canuto and Barrientos 2010: fig. 4b)
^{pu}PUK=ya u=K'AK'	*puk-[u]y-Ø k'a[h]k'*	2MED	2.e.ii	YAX	St. 1	C8-B9	Usumacinta	09.12	(Tate 1992: fig. 124)

pul – VER.TR.R: "to burn"

pu-lu=ji=ya	*pu<h>l-j-Ø=iy*	1PASS	2.f.ii	CHN	CC-HB	30	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
pu-la=ja	*pu<h>l-aj-Ø*	1PASS	1.b.i	YUL	Lnt. 1	B4	Yucatan	10.02	(Love 1989a: fig. 2)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	COL	St. Amparo	A3	?	09.18	(Mayer 1995: pl. 118)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	CPN	Msc. Cylinder	D1	Motagua	09.14	(Schele 1987a: fig. 1)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W V	C1a	Pasion	09.12	(Fahsen 2002: fig. 8)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W V	D1a	Pasion	09.12	(Fahsen 2002: fig. 8)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	IXK	St. 2	C9	Mopan-Pusilha	09.17	(Graham 1980: 141)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	IXK	St. 2	B11	Mopan-Pusilha	09.17	(Graham 1980: 141)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 12	C7a	Central Peten	09.18	(Graham and von Euw 1975: 36)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 22	E16a	Central Peten	09.13	(Graham and von Euw 1975: 56)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 22	F18a	Central Peten	09.13	(Graham and von Euw 1975: 56)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 22	G7a	Central Peten	09.13	(Graham and von Euw 1975: 56)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 22	G12	Central Peten	09.13	(Graham and von Euw 1975: 56)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 22	H14a	Central Peten	09.13	(Graham and von Euw 1975: 56)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 23	E9	Central Peten	09.14	(Graham and von Euw 1975: 60)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 30	H9a	Central Peten	09.14	(Graham 1980: 80)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 35	D2	Central Peten	09.18	(Graham 1980: 92)
i pu-lu=yi	*i['] pul-[u]y-i-Ø*	2MED	1.a.ii	PAL	TC	O5	Tabasco	09.12	(Robertson 1991: fig. 9)
pu-lu=yi	*pul-[u]y-i-Ø*	2MED	1.a.ii	PAL	TFC	L2	Tabasco	09.12	(Robertson 1991: fig. 153)
i pu-lu=yi	*i['] pul-[u]y-i-Ø*	2MED	1.a.ii	PAL	TFC	N8	Tabasco	09.12	(Robertson 1991: fig. 153)
pu-lu=yi	*pul-[u]y-i-Ø*	2MED	1.a.ii	PAL	TS	N5	Tabasco	09.12	(Robertson 1991: fig. 95)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 1	D13	Usumacinta	09.13	(Stuart and Graham 2003: 20)
pu-lu=yi	*pul-[u]y-i-Ø*	2MED	1.a.ii	PNG	St. 23	I8	Usumacinta	09.17	(Teufel 2004: 412)

PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 9	Cp12a	Usumacinta	09.15	(Stuart and Graham 2003: 52)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	SCU	St. 10	B8a	Mopan-Pusilha	09.18	(Laporte et al. 2006: fig. 16)
PUL=yi	*pul-[u]y-i-Ø*	2MED	2.e.ii	TIK	MT 29	A7a	Central Peten	09.15	(Moholy-Nagy 2008: fig. 198a)

sa' – NOUN: "atole"

sa=la	*sa[']-[a]l*	1ATTR	2.e.i	NAR	K6813	A1	Central Peten	09.07	(Kerr and Kerr 2000: 980)
sa=la	*sa[']-[a]l*	1ATTR	2.e.i	TIK	MT. 3	B1	Central Peten	08.18	(Culbert 1993: fig. 19c)

sak – ADJ: "white"

SAK=ja=li	*sak-j-al*	1INCH	2.f.ii	PAL	HCEF	I1	Tabasco	09.11	(Robertson 1985b: fig. 333b)
SAK=ja=lV	*sak-j-al*	1INCH	2.f.ii	PAL	HCHS	C10a	Tabasco	09.11	(Robertson 1985b: fig. 319)
SAK=ja=la SUTZ'	*sak-j-al sutz'-Ø*	1INCH	2.f.ii	YAX	Lnt. 60	C6-D6	Usumacinta	09.04	(Barthel 1966)

sat – VER.TR.R: "to destroy"

sa-ta=yi	*sat-ay-i-Ø*	2MED	1.a.ii	PAL	TI-E	O8	Tabasco	09.12	(Robertson 1983b: fig. 95)
sa-ta=yi	*sat-ay-i-Ø*	2MED	1.a.ii	PAL	TI-E	O9	Tabasco	09.12	(Robertson 1983b: fig. 95)

saw – VER.TR.R: "to twist"

sa-wa=ja u=TOK'=PAKAL	*sa<h>w-aj-Ø u-tok'-pakal*	1PASS	1.a.i	NAR	St. 23	H13-G14	Central Peten	09.14	(Graham and von Euw 1975: 60)

sel – VER.TR.R: "to grind maize"

se-la=ja	*se<h>l-aj-Ø*	1PASS	1.b.i	C Ma.	107c	H1	Yucatan	11.11	(Anders 1967: 107)
se=ja	*se<h>[l]-[a]j-Ø*	1PASS	2.g.i	C Ma.	107c-108c	I1	Yucatan	11.11	(Anders 1967: 107)
se-la=ja	*se<h>l-aj-Ø*	1PASS	1.b.i	C Ma.	108c	A1	Yucatan	11.11	(Anders 1967: 107)
se=ja	*se<h>[l]-[a]j-Ø*	1PASS	2.g.i	C Ma.	108c	B1	Yucatan	11.11	(Anders 1967: 107)

sih – NOUN: "gift"

AJ SIH^{ji}=ja	*aj sih-[a]j*	1ABSL	2.a.i	COL	K2206	L1	Southern Peten	?	(Kerr 1990: 219)
si-hi=ja	*sih-[a]j-Ø*	1ABSL	2.a.i	TAM	HS. 3 V	E1	Pasion	09.13	(Gronemeyer 2013: pl. 33)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	ALC	St. 1	A2	Central Peten	09.06	(Grube 2008: fig. 8.18)
SIH-ya=ja=ji=ya	*siy-aj-Ø=[i]j=iy*	1INCH	1.b.i	ALC	St. 1	B5	Central Peten	09.06	(Grube 2008: fig. 8.18)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	AML	HS. 1 St1	B2	Pasion	09.18	(Houston 1993: fig. 4.24)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CAY	Lnt. 1	A10	Usumacinta	09.17	(John Montgomery n.p.)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	CAY	Alt. 4	B'4	Usumacinta	09.15	(Mathews 1998: fig. 3)
SIH-ya CHAN^{na}	*siy-a[j]-Ø chan*	1INCH	2.g.ii	CAY	Alt. 4	D1	Usumacinta	09.15	(Mathews 1998: fig. 4)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CDO	P. 1	C5	Usumacinta	09.14	(Ian Graham n.p.)

SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	CDO	P. 1	D7	Usumacinta	09.14	(Ian Graham n.p.)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	CNC	P. 2	B3	Southern Peten	09.18	(Mayer 1989: pl. 105)
SIH=ja	*sih-[a]j-Ø ?*	1INCH	2.e.i	COL	Berlin Ca 50170	A5	?	?	(Grube and Gaida 2006: #6)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1440	C5	?	?	(Robicsek and Hales 1982: fig. 23b)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K688	C1	?	?	(Kerr 1989: 36)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1081	A3	?	?	(Robicsek and Hales 1982: #11)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1184	A3	?	?	(Robicsek and Hales 1982: fig. 20a)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1198	A3	?	?	(Robicsek and Hales 1982: #9)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K8622	I1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K8622	Q1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1645	A3	?	?	(Robicsek and Hales 1982: #17)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1670	P1	Central Peten	?	(Kerr 1989: 103)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K1813	A3	?	?	(Robicsek and Hales 1982: #12a)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K3150	A2	?	?	(Kerr 1992: 389)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K3201	C1	?	?	(Justin Kerr n.p.)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K3702	C1	?	?	(Parsons and Carlson 1988: #66)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K4485	A3	?	?	(Kerr 1994: 545)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K5164	C1	?	?	(Kerr and Kerr 2000: 926)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K5230	C1	?	?	(Justin Kerr n.p.)
SIH=ja	*si[y]-[a]j-Ø*	1INCH	2.e.i	COL	K5645	pF1	?	?	(Justin Kerr n.p.)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K5763	E1	?	?	(Kerr and Kerr 2000: 937)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K6754	A3	?	?	(Kerr and Kerr 2000: 977)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	K7460	H1	?	?	(Kerr and Kerr 2000: 998)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	P. Em. Zapata	A2	Tabasco	09.13	(Stuart 1990b: fig. 1)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	COL	P. Em. Zapata	B4	Tabasco	09.13	(Stuart 1990b: fig. 1)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	P. Maegli Band	B1a	?	?	(Mayer 1989: pl. 89)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	COL	P. DOAKS 1	J3a	Usumacinta	09.15	(Looper 2009: fig. 1.12)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	P. DOAKS 1	A10	Usumacinta	09.15	(Looper 2009: fig. 1.12)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	COL	St. Nil Sajal	A3	Usumacinta	09.16	(Mayer 1995: pl. 104)
SIH=ja	*si[y]-[a]j-Ø*	1INCH	2.e.i	CPN	Alt. Y	A2	Motagua	09.09	(Schele 1990b: fig. 11)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CPN	St. 3	B11	Motagua	09.11	(Alexander 1988: fig. 2)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CPN	St. 6	D8	Motagua	09.12	(McCready et al. 1988: fig. 3)
SIH=ja=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	CPN	St. 7	F8	Motagua	09.09	(Schele and Stuart 1986a: fig. 2)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CPN	St. 7	B12b	Motagua	09.09	(Schele and Stuart 1986a: fig. 2)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRC	St. 3	A8a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRC	St. 3	B18a	Mopan-Pusilha	09.10	(Beetz and Satterthwaite 1981: fig. 4)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	CRC	St. 5	D24b	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 6b)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRN	HS. 2 VI	B2	Central Peten	09.14	(Mayer 1995: pl. 79)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRN	HS. 3 V	B2	Central Peten	09.13	(Canuto et al. 2008: fig. 2.9)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRN	P. 3	D1	Central Peten	09.11	(Mayer 1987: pl. 37)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRN	P. 3	F8	Central Peten	09.11	(Mayer 1987: pl. 37)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	CRN	P. 4	A4	Central Peten	09.11	(Mayer 1995: pl. 145)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	DPL	HS. 2 C IV	F1	Pasion	09.12	(Fahsen 2002: fig. 6)

SIH-ya=a	*siy-a[j]-Ø*	1INCH	1.g.i	DPL	St. 8	F12	Pasion	09.14	(Houston 1993: fig. 4.14)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	DPL	St. 14	H1	Pasion	09.14	(Houston 1993: fig. 3.24)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	IXZ	P. 1 VIII	2	Mopan-Pusilha	09.17	(Graham 1980: 183)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	LGP	Alt. 1	A3	Western Peten	09.16	(Ian Graham n.p.)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	MRL	St. 2	B9	Tabasco	09.15	(Pavón n.p.)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	MRL	St. 2	C8	Tabasco	09.15	(Pavón n.p.)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	MRL	St. 4	A9	Tabasco	09.13	(Lizardi Ramos 1961: 109)
SIH-ya=ja K'AWIL	*siy-aj-Ø k'awil*	1INCH	1.b.i	MTL	K1453	A1	Central Peten	09.15	(Kerr 1989: 86)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 1	E2	Central Peten	09.13	(Graham and von Euw 1975: 12)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 10	A2	Central Peten	09.19	(Graham and von Euw 1975: 31)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 12	B2	Central Peten	09.19	(Graham and von Euw 1975: 36)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 21	F6	Central Peten	09.13	(Graham and von Euw 1975: 56)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 22	G3	Central Peten	09.13	(Graham and von Euw 1975: 56)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 24	B13	Central Peten	09.13	(Graham and von Euw 1975: 64)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	NAR	St. 29	H8	Central Peten	09.14	(Graham 1978: 78)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	T18S	247	Tabasco	09.14	(Schele and Mathews 1979: no. 501)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	T19B-S	I1	Tabasco	09.15	(Stuart 2005b: pl. 2)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	T19B-S	I4	Tabasco	09.15	(Stuart 2005b: pl. 2)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j[=iy]*	1INCH	1.b.i	PAL	T19B-S	I6	Tabasco	09.15	(Stuart 2005b: pl. 2)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	HCHS	A9	Tabasco	09.11	(Robertson 1985b: fig. 319)
SIH-ya=ja K'AK'	*siy-aj-Ø k'a[h]k'*	1INCH	1.b.i	PAL	HDPG	A1	Tabasco	09.13	(Robertson 1985b: fig. 239)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	NGT1	A	Tabasco	09.11	(Schele and Mathews 1979: no. 44)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	PT	C4	Tabasco	09.14	(Robertson 1985b: fig. 258)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	PT	S3	Tabasco	09.14	(Robertson 1985b: fig. 258)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	SLAV	A4a	Tabasco	09.14	(Robertson 1991: fig. 229)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TISL	3	Tabasco	09.12	(Robertson 1983b: fig. 170)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TC	A17	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	D2	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TC	E7	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	TC	E17	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	P7	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TC	P5	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	P11	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	P13	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	TC	R15	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	S4	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	S9	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	TC	T13	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	TC	T13	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TC	U7	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PAL	TC	U2	Tabasco	09.12	(Robertson 1991: fig. 9)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TCI2	r3	Tabasco	09.13	(Schele and Mathews 1979: no. 282)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TFC	B16	Tabasco	09.12	(Robertson 1991: fig. 153)

SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PAL	TFC	N2	Tabasco	09.12	(Robertson 1991: fig. 153)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	PAL	TI-W	E2	Tabasco	09.12	(Robertson 1983b: fig. 97)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TS	C1	Tabasco	09.12	(Robertson 1991: fig. 95)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	TS	P13	Tabasco	09.12	(Robertson 1991: fig. 95)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	WARP	A10	Tabasco	09.13	(Schele 1990c: fig. 1)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	WARP	F2	Tabasco	09.13	(Schele 1990c: fig. 1)
si-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PAL	SJPL	B1	Tabasco	09.10	(Robertson 1983b: fig. 142)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	P. 1	C1	Usumacinta	09.17	(Coe and Kerr 1997: fig. 53)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PNG	Shl. J-5	E1	Usumacinta	09.14	(Stuart 1985b: fig. 1)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	Shl. J-5	B1	Usumacinta	09.14	(Stuart 1985b: fig. 1)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PNG	St. 1	F3	Usumacinta	09.13	(Stuart and Graham 2003: 18)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	Trn. 1	Q1	Usumacinta	09.17	(Teufel 2004: 549)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	Alt. 2	A1	Usumacinta	09.16	(Teufel 2004: 540)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 3	A8	Usumacinta	09.14	(Stuart and Graham 2003: 26)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 3	D6	Usumacinta	09.14	(Stuart and Graham 2003: 26)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 3	G17	Usumacinta	09.14	(Stuart and Graham 2003: 27)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 6	D8	Usumacinta	09.12	(Stuart and Graham 2003: 38)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PNG	St. 7	B10a	Usumacinta	09.15	(Stuart and Graham 2003: 40)
i SIH=ji=ya	*i['] si[y]-j-Ø=[i]y*	1INCH	2.f.ii	PNG	St. 8	A14	Usumacinta	09.14	(Stuart and Graham 2003: 46)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 8	A9	Usumacinta	09.14	(Stuart and Graham 2003: 46)
^{si}SIH=ja=ji=ya	*si[y]-[a]j-Ø=[i]j=iy*	1INCH	2.e.i	PNG	St. 8	C'20	Usumacinta	09.14	(Stuart and Graham 2003: 48)
SIH-ya=ji=ya	*siy-aj-Ø=iy*	1INCH	1.b.ii	PNG	St. 9	Cp6	Usumacinta	09.15	(Stuart and Graham 2003: 52)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	P. 15	A10	Usumacinta	09.13	(Houston et al. 2000: fig. 5)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PNG	St. 36	C5	Usumacinta	09.11	(Teufel 2004: 451)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	POB	St. 2	D8	Quintana Roo	09.07	(Esparza Olguín and Pérez Gutiérrez 2009)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	POB	St. 3	E1	Quintana Roo	09.07	(Esparza Olguín and Pérez Gutiérrez 2009)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	PRU	St. 15	Dp1	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	PRU	St. 15	Dp8	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	PST	St. 1	D4	Chiapas	09.11	(Graham and Mathews 1999: 182)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	PUS	St. H	D14	Mopan-Pusilha	09.11	(Prager 2002a, III: fig. 10)
ma=ye=se	*[u-sih-]m-ay-es-Ø*	1INCH	1.f.ii	RAZ	Jd. Celt 1	A5	Central Peten	09.00	(Grube and Martin 2001: 48)
SIH=ja=ji=ya	*si[j]-(j)-Ø=[i]j=iy*	1INCH	2.f.ii	RAZ	Bur. 1	A8	Central Peten	08.19	(Hellmuth 1987: fig. 594)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	RAZ	St. 2	M2	Central Peten	09.11	(Adams 1999: fig. 3.46)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	RAZ	St. 2	N6	Central Peten	09.11	(Adams 1999: fig. 3.46)
u=si-ji=ma=ye=se	*u-si[h]-m-ay-es-Ø*	1INCH	1.f.ii	RAZ	Jd. Celt 2	B4-A5	Central Peten	09.00	(Grube and Martin 2001: 49)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	REI	HS. 1 A	pA1b	Western Peten	09.13	(Stuart 2012a: fig. 4)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	REJ	St. 1	B9b	Mopan-Pusilha	09.10	(Grube and Martin 2004: 37)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	SUF	St. 6	pD3	Central Peten	08.17	(Grube and Martin 2004: 6)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	SUF	M. 9	E6	Central Peten	08.17	(Estrada-Belli et al. 2009: fig. 7)
SIH=ji=ya	*si[j]-(j)-Ø=iy*	1INCH	2.f.ii	TAM	St. 5	Bp6	Pasion	09.03	(Houston 1993: fig. 3.5)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	TCB	St. 1	Ap6b	Usumacinta	09.04	(Simon Martin n.p.)
SIH=ja CHAN	*sih-[a]j-Ø chan*	1INCH	2.e.i	TIK	Col. Vessel	G	Central Peten	09.00	(Martin 2003: fig. 1.10)
SIH K'AK'	*sih[-aj]-Ø k'a[h]k'*	1INCH	2.g.ii	TIK	Marcador	A8	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)

SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	TIK	Marcador	D4	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	TIK	Marcador	H4	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
SIH-ya=ja K'AK'	*siy-[a]j-Ø k'a[h]k'*	1INCH	1.b.i	TIK	St. 4	A7a	Central Peten	08.18	(Jones and Satterthwaite 1982: fig. 4)
SIH K'AK'	*sih[-aj]-Ø k'a[h]k'*	1INCH	2.g.ii	TIK	St. 18	B11	Central Peten	08.18	(Jones and Satterthwaite 1982: fig. 26)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	TIK	St. 23	B4	Central Peten	09.03	(Jones and Satterthwaite 1982: fig. 36)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	TIK	St. 24	E16	Central Peten	09.19	(Jones and Satterthwaite 1982: fig. 37)
SIH K'AK'	*sih[-aj]-Ø k'a[h]k'*	1INCH	2.g.ii	TIK	St. 31	C22	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
SIH K'AK'	*sih[-aj]-Ø k'a[h]k'*	1INCH	2.g.ii	TIK	St. 31	E14	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
SIH=ya	*siy-a[j]-Ø*	1INCH	1.g.i	TIK	MT 34	A4	Central Peten	09.15	(Moholy-Nagy 2008: fig. 195d)
SIH=ja	*si[y]-[a]j-Ø*	1INCH	2.e.i	TNA	Frg. 71	pB1	Chiapas	09.12	(Peter Mathews n.p.)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	TNA	Mon. 20	E4	Chiapas	09.14	(Mathews 1983: 56)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	TNA	Mon. 134	B2	Chiapas	09.13	(Graham and Mathews 1999: 160)
SIH=ji=ya	*si[y]-j-Ø=[i]y*	1INCH	2.f.ii	TNA	Mon. 164	E1	Chiapas	09.14	(Graham and Henderson 2006: 105)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	TNA	Mon. 175	pL1a	Chiapas	09.16	(Graham and Henderson 2006: 120)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	TRT	Mon. 6	F5	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
SIH CHAN AK	*sih[-aj]-Ø chan a[h]k*	1INCH	2.g.ii	UAX	JM Disk 6528	B2-A3	Central Peten	?	(Mora-Marín 2001: fig. A1.20)
SIH K'AK'	*sih[-aj]-Ø k'a[h]k'*	1INCH	2.g.ii	UAX	St. 4	Bp5	Central Peten	08.18	(Graham 1986: 142)
SIH=ja K'AK'	*sih-[a]j-Ø k'a[h]k'*	1INCH	2.e.i	UAX	St. 5	B9	Central Peten	08.17	(Graham 1986: 145)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	UAX	St. 7	Cp2	Central Peten	08.19	(Graham 1986: 152)
SIH=ya	*siy-a[j]-Ø*	1INCH	1.g.i	UCN	St. 4	D1b	Mopan-Pusilha	10.01	(Graham 1980: 159)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	XUP	Mon. 1	B1	Tabasco	09.12	(Alexandre Safronov n.p.)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	YAX	Lnt. 13	A3	Usumacinta	09.16	(Graham and von Euw 1977: 35)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	YAX	Lnt. 17	A3	Usumacinta	09.16	(Graham and von Euw 1977: 43)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	YAX	Lnt. 30	H1	Usumacinta	09.16	(Graham 1979: 69)
SIH=ja	*sih-[a]j-Ø*	1INCH	2.e.i	ZAP	St. 1	A5	Central Peten	08.19	(Schele, Fahsen and Grube 1992: fig. 7)
SIH-ya=ja	*siy-aj-Ø*	1INCH	1.b.i	ZPB	St. 1	B6	Western Peten	09.10	(Fitzsimmons 2012: fig. 5)
SIH-ya=ja=ji	*siy-aj-Ø=[i]j=i[y]*	1INCH	1.b.i	ZPB	St. 1	A9	Western Peten	09.10	(Fitzsimmons 2012: fig. 5)
SIH=ja=ji=ya	*si[y]-j-Ø=[i]j=iy*	1INCH	2.f.ii	ZPT	Alt. 1	E1	Central Peten	10.01	(Stuart 2009: fig. 13.?)

sin – VER.TR.R: "to extend"

si-na=ja	*si<h>n-aj-Ø*	1PASS	1.b.i	C Ma.	102c	A1	Yucatan	11.11	(Anders 1967: 102)
si-na=ja	*si<h>n-aj-Ø*	1PASS	1.b.i	C Ma.	102c	C1	Yucatan	11.11	(Anders 1967: 102)
si-na=ja	*si<h>n-aj-Ø*	1PASS	1.b.i	C Ma.	102c	E1	Yucatan	11.11	(Anders 1967: 102)
si-na	*si<h>n-a[j]-Ø*	1PASS	1.g.i	C Ma.	102c	F1	Yucatan	11.11	(Anders 1967: 102)

sus – VER.TR.R: "to peel, to scrape"

su-sa=ja	*su<h>s-aj-Ø*	1PASS	1.b.i	CPN	St. A	B7b	Motagua	09.14	(Alexander 1988: fig. 1)
u=^{2}su=lu me-se	*u-sus-ul mes*	1ATTR	1.a.i	CRC	BCm. 3	D5-C6	Mopan-Pusilha	09.18	(Chase, Grube and Chase 1991: fig. 3)

ta[h]n – NOUN: "chest"

K'IN=TAN=la	*k'in-ta[h]n-[a]l*	1ATTR	2.e.i	COL	K531	F1	?	?	(Robicsek and Hales 1982: #33)

taj – NOUN: "torch, pine, forest"

TAJ MO'[o]	*taj[-al] mo'*	1ATTR	4.a.iii	BPK	R. 1-IS	W2	Usumacinta	09.17	(Miller and Houston 1998: fig. 2)
TAJ MO'[o]	*taj[-al] mo'*	1ATTR	4.a.iii	BPK	Lnt. 2	B3	Usumacinta	09.17	(Mathews 1980: fig. 6)
TAJ MO'[o]	*taj[-al] mo'*	1ATTR	4.a.iii	BPK	Lnt. 2	D1	Usumacinta	09.17	(Mathews 1980: fig. 6)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	DPL	HS. 2 E I	C2	Pasion	09.12	(Fahsen 2002: fig. 7)
TAJ MO	*taj[-al] mo'*	1ATTR	4.a.iii	LTI	P. 1	G1	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
TAJ MO	*taj[-al] mo'*	1ATTR	4.a.iii	LTI	P. 3	H3	Usumacinta	09.17	(Stefanie Teufel n.p.)
ta MO'-o	*ta[j-al] mo'*	1ATTR	4.a.iii	MQL	Str. 4 Frg. F	1b	Southern Peten	10.00	(Graham 1967: fig. 39)
ta-ja=la MO'[o]	*taj-al mo'*	1ATTR	1.a.i	MQL	Str. 4 Frg. V	2-3	Southern Peten	10.00	(Graham 1967: fig. 39)
CHAK ta-ja=la WAY	*chak taj-al way*	1ATTR	1.a.i	OXP	St. 2	B5	Central Campeche	09.17	(Grube 2008: fig. 8.23)
CHAK ta-ja=la WAY[ya]	*chak taj-al way*	1ATTR	1.a.i	OXP	St. 10	B4-B6	Central Campeche	09.16	(Grube 2008: fig. 8.34)
ta-ja=la MO'[o]	*taj-al mo'*	1ATTR	1.a.i	REI	HS. 1 A	A2b-B2a	Western Peten	09.13	(Stuart 2012a: fig. 4)
TAJ=AL[la]	*taj-al*	1ATTR	1.e.iv	TIK	Hombre	C2	Central Peten	08.18	(Fahsen 1988: fig. 4)
TAJ=AL[la]	*taj-al*	1ATTR	1.e.iv	TRS	St. 1	B7	Pasion	08.19	(Lacadena 2011: fig. 4a)
ta-ja=la MO'[o]	*taj-al mo'*	1ATTR	1.a.i	YAX	HS. 5 I	84	Usumacinta	09.18	(Graham 1979: 179)
u=4=TAJ=MO'[o]	*u-4-taj[-al]-mo'-Ø*	1ATTR	4.a.iii	YAX	HS. 5 II	152	Usumacinta	09.18	(Graham 1979: 181)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	YAX	St. 7	pC4	Usumacinta	09.17	(Tate 1992: fig. 89)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	YAX	Lnt. 10	B6b	Usumacinta	09.18	(Graham and von Euw 1977: 31)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	YAX	Lnt. 10	C7b	Usumacinta	09.18	(Graham and von Euw 1977: 31)
ta-ja=la MO'[o]	*taj-al mo'*	1ATTR	1.a.i	YAX	St. 21	pG5	Usumacinta	09.17	(Tate 1992: fig. 151)
IX ta-ja=la TUN[ni]	*ix taj-al tun*	1ATTR	1.a.i	YAX	Lnt. 23	J2-K1a	Usumacinta	09.14	(Graham 1979: 135)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	YAX	St. 24	pD3	Usumacinta	09.17	(Mathews 1988: fig. 8.13)
TAJ MO-o	*taj[-al] mo'*	1ATTR	4.a.iii	YAX	St. 29	pA3	Usumacinta	09.17	(Mathews 1988: fig. 8.12)

tak – ADJ: "dry, withered"

ta-ki=ja	*tak-[a]j-Ø*	1INCH	2.c.i	PAL	TI-M	G6	Tabasco	09.12	(Robertson 1983b: fig. 96)

tak' – VER.TR.R: "to plaster"

u=ta=k'a	*u-tak'-a-Ø*	2IND	1.g.i	C Ma.	14a	A1	Yucatan	11.11	(Anders 1967: 14)
u=ta=k'a	*u-tak'-a-Ø*	2IND	1.g.i	C Ma.	14a	C1	Yucatan	11.11	(Anders 1967: 14)
u=ta=k'a	*u-tak'-a-Ø*	2IND	1.g.i	C Ma.	14a	E1	Yucatan	11.11	(Anders 1967: 14)

tap – VER.TR.R: "to renew, to repaint"

u=ta-pa=wa	*u-tap-a-Ø*	2IND	1.a.i	COL	Lnt. 3 Site R	B2	Usumacinta	09.15	(Stefanie Teufel n.p.)

tay – VER.TR.R: "to consume / to rub"

ta-ya=ja	*ta<h>y-aj-Ø*	1PASS	1.a.i	TNA	P. Emi. Zapata	Ap1a	Chiapas	09.07	(Peter Mathews n.p.)
ta=AL CHAN^{na}	*ta<h>[y]-al-Ø*	3NMLS	1.e.iv	DPL	Bur. 30 Plate		Central Peten	09.14	(Tokovinine and Zender 2012: fig. 2.5a)
ta-ye=le	*ta<h>y-el-Ø*	3NMLS	1.b.i	MTL	K4996	T1	Central Peten	09.15	(Kerr 1994: 640)
ta-ye=le	*ta<h>y-el-Ø*	3NMLS	1.b.i	MTL	K2573	K4	Central Peten	09.15	(Kerr 1990: 245)
ta-ye=le	*ta<h>y-el-Ø*	3NMLS	1.b.i	MTL	K8286	I1	Central Peten	09.15	n/a
ta-ye	*ta<h>y-e[l]-Ø*	3NMLS	1.g.i	TAM	Msc. 4	C1	Central Peten	09.15	(Gronemeyer 2013: pl. 39)

te' – NOUN: "tree"

TE'=le	*te'-[e]l*	1POSS	2.e.i	ALS	K3120	L1	Central Peten	09.16	(Velásquez García 2009b: fig. 9a)
TE' ka	*te'[-el] ka[kaw]*	1POSS	2.g.ii	BPT	Bur. 2 Msc. 2	E1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5a)
TE' ka	*te'[-el] ka[kaw]*	1POSS	2.g.ii	BPT	Ca. 1 Msc. 5	F1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5b)
MUY TE'=le	*muy te'-[e]l*	1POSS	2.e.i	BPT	Msc. Min. Vessel	F1	Mopan-Pusilha	09.17	(Grube and Martin 2004: 67)
TE'=ba=ja	*te'-b-aj-Ø*	1INCH	1.f.ii	COL	Bx. Tabasco	pO1	Tabasco	09.11	(Anaya, Guenter and Mathews 2001)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	El Señor	A6	Central Peten	?	(Sebastian Matteo n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K531	A3	Central Peten	?	(Robicsek and Hales 1982: #33)
TE'=li	*te'-[e]l*	1POSS	2.e.ii	COL	K511	C1	Central Peten	?	(Reents-Budet 1994: 39)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K554	J1	?	?	(Schele and Miller 1986: pl. 48a)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K555	I1	?	?	(Coe 1978: #8)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K559	D1	?	?	(Kerr 1989: 20)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K595	J1	?	?	(Coe 1978: #12)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K671	J1	?	?	(Kerr 1989: 32)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K764	I1	?	?	(Kerr 1989: 45)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1182	B1	?	?	(Robicsek and Hales 1982: #15)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1197	A3	?	?	(Robicsek and Hales 1982: #30)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1211	G1	?	?	(Coe 1982: #58)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1230	B1	?	?	(Robicsek and Hales 1982: #40)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1256	I1	Pasion	?	(Robicsek and Hales 1982: #54)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1303	F1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1303	G1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1344	I3	Central Peten	?	(Robicsek and Hales 1982: #125)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1371	M3	Central Peten	?	(Robicsek and Hales 1982: #128)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1377	H1	?	?	(Robicsek and Hales 1982: fig. 31b)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1560	E1	?	?	(Kerr 1989: 98)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1775	H1	?	?	(Kerr 1989: 109)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1873	I1	?	?	(Kerr 1989: 120)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K1873	S1	?	?	(Kerr 1989: 120)
TE'	*te'[-el]*	1POSS	2.g.ii	COL	K2220	H1	?	?	(Kerr 1990: 225)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K2292	I1	?	?	(Kerr 1990: 230)
ti TE'=le	*ti te'-[e]l*	1POSS	2.e.i	COL	K2295	F1	Central Peten	?	(Kerr 1990: 233)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K2695	G1	?	?	(Kerr 1990: 255)

TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K2801	B1	?	?	(Kerr 1990: 296)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K3033	I1	Central Peten	?	(Reents-Budet 1994: 274)
TE'	*te'[-el]*	1POSS	2.g.ii	COL	K3035	K1	?	?	(Persis Clarkson n.p.)
ta TE'	*ti te'[-el]*	1POSS	2.g.ii	COL	K3059	F1	?	?	(Jim Crocker n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K3066	G1	Central Peten	?	(Justin Kerr n.p.)
IXIM TE'=la	*ixim te'-[e]l*	1POSS	2.e.ii	COL	K3699	H1	?	?	(Kerr 1992: 429)
IXIM TE' ka-wa	*ixim te'[-el] ka[ka]w*	1POSS	2.g.ii	COL	K3861	B1	?	?	(Kerr 1992: 444)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K3924	O1	?	?	(Kerr 1992: 446)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4021	H1	?	?	(Kerr 1992: 455)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4030	pD1	?	?	(Kerr 1992: 456)
ta IXIM TE'=le	*ta ixim te'-[e]l*	1POSS	2.e.i	COL	K4114	B1	Central Peten	?	(Justin Kerr n.p.)
IXIM TE'=le	*ixim te'-[e]l*	1POSS	2.e.i	COL	K4340	G1a	?	09.14	(Kerr 1992: 474)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K4375	J1	?	?	(Kerr 1992: 481)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4379	H1	?	?	(Kerr 1992: 484)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4546	A3	?	?	(Kerr and Kerr 1997: 733)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4619	E1	Central Peten	?	(Kerr 1994: 564)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4689	I1	?	?	(Kerr 1994: 592)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4922	N1	?	?	(Kerr 1994: 611)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4946	G1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4962	O1	?	?	(Kerr 1994: 635)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4988	L1	?	?	(Kerr 1994: 635)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K4991	C1	Central Peten	?	(Kerr 1994: 638)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K5016	I1	?	?	(Justin Kerr n.p.)
TE'=e-le	*te'-el*	1POSS	1.e.i	COL	K5241	F1	Central Peten	?	(Justin Kerr n.p.)
ti TE'	*ti te'[-el]*	1POSS	2.g.ii	COL	K5356	F1	Central Peten	?	(Reents-Budet 1994: 185)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K5514	B1	?	?	(Coe 1973: 219)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K5514	D1	?	?	(Coe 1973: 219)
ta IXIM le	*ta ixim [te']-[e]l*	1POSS	2.g.i	COL	K5648	D1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K5720	G1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K5847	J1	?	?	(Kerr and Kerr 2000: 943)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K5857	H1	?	?	(Kerr and Kerr 1997: 821)
TE'=e-le	*te'-el*	1POSS	1.e.i	COL	K5976	D1	Central Peten	?	(Kerr and Kerr 2000: 950)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6294	A7	?	?	(Kerr and Kerr 2000: 957)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6418	G4	Central Peten	?	(Kerr and Kerr 2000: 963)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6436	E1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6437	H1	?	?	(Kerr and Kerr 2000: 967)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6508	I1	Central Peten	?	(Justin Kerr n.p.)
TE'	*te'[-el]*	1POSS	2.g.ii	COL	K6618	N1	Central Peten	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K6659	H1	?	?	(Justin Kerr n.p.)
TE'=li	*te'-[e]l*	1POSS	2.e.ii	COL	K7224	G1-H1	Southern Peten	?	(Kerr and Kerr 2000: 992)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7268	J1	?	?	(Kerr and Kerr 2000: 994)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7524	H1	Central Peten	?	(Kerr and Kerr 2000: 999)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7727	M1	?	?	(Kerr and Kerr 2000: 1005)

TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7794	I2	?	?	(Kerr and Kerr 2000: 1007)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7821	I1	?	?	(Kerr and Kerr 2000: 1010)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K7912	G3	?	?	(Kerr and Kerr 2000: 1011)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K8242	I1	?	?	(Justin Kerr n.p.)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	COL	K8242	X1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K8393	M1	Central Peten	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K8469	G1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	COL	K8722	I1	?	?	(Justin Kerr n.p.)
TE'=le	*te'-[e]l*	1POSS	2.e.i	MTL	K791	J1	Central Peten	09.16	(Kerr 1989: 49)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	MTL	K1004	B1	Central Peten	09.15	(Robicsek and Hales 1982: #186)
TE'=le	*te'-[e]l*	1POSS	2.e.i	MTL	K1004	M1	Central Peten	09.15	(Robicsek and Hales 1982: #186)
TE'=le	*te'-[e]l*	1POSS	2.e.i	MTL	K1728	J1	Central Peten	09.16	(Kerr 1989: 105)
IXIM TE'=le	*ixim te'-[e]l*	1POSS	2.e.i	MTL	K5850	F1	Central Peten	?	(Kerr and Kerr 2000: 944)
TE'=le	*te'-[e]l*	1POSS	2.e.i	MTL	K8286	G1	Central Peten	?	n/a
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K633	F1	Central Peten	09.16	(Reents-Budet 1994: 63)
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K635	H1	Central Peten	?	(Robicsek and Hales 1982: #183)
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K1698	E1	Central Peten	?	(Kerr 1989: 104)
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K2796	E1	Central Peten	?	(Coe 1973: #49)
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K4464	E1	Central Peten	09.13	(Reents-Budet 1994: 99)
TE'=le	*te'-[e]l*	1POSS	2.e.i	NAR	K7750	E1	Central Peten	09.17	(Grube 1998b)
TE'=le	*te'-[e]l*	1POSS	2.e.i	PAL	TC	K1a	Tabasco	09.12	(Robertson 1991: fig. 9)
TE'=le	*te'-[e]l*	1POSS	2.e.i	RAZ	K1383	A7	Central Peten	?	(Kerr 1989: 78)
TE'=e-le	*te'-el*	1POSS	1.e.i	RAZ	K3744	F1	Central Peten	?	(Kerr 1992: 433)
TE'=le	*te'-[e]l*	1POSS	2.e.i	TIK	K4976	G1	Central Peten	?	(Kerr 1994: 634)
TE'=le	*te'-[e]l*	1POSS	2.e.i	TIK	K4976	S2	Central Peten	?	(Kerr 1994: 634)
IXIM TE'	*ixim te'[-el]*	1POSS	2.g.ii	TIK	MT 9	D1b	Central Peten	09.01	(Moholy-Nagy 2008: fig. 139a)
TE'=le	*te'-[e]l*	1POSS	2.e.i	TIK	MT 56	F1b	Central Peten	09.15	(Moholy-Nagy 2008: fig. 97)
TE'=le	*te'-[e]l*	1POSS	2.e.i	TIK	MT 249	pB1	Central Peten	?	n/a
TE'=e-le	*te'-el*	1POSS	1.e.i	TIK	MT 176	D1	Central Peten	09.16	(Culbert 1993: fig. 84)
TE'=le	*te'-[e]l*	1POSS	2.e.i	UAX	IS Vase	O1	Central Peten	?	(Smith 1932: pl. 5)
TE'=le	*te'-[e]l*	1POSS	2.e.i	ZBP	K1387	I1	Western Peten	?	(Robicsek and Hales 1982: #170)
TE'	*te'[-el]*	1POSS	2.g.ii	ZBP	K2803	J1	Western Peten	?	(Schele and Miller 1986: pl. 96a)
ta tzi TE'=le	*ta tzi[h] te'-[e]l*	1POSS	2.e.i	ZBP	K3844	F1	Western Peten	?	(Kerr 1992: 443)

tek' – VER.TR.R: "to place"

te-k'a=ja	*te<h>k'-aj-Ø*	1PASS	1.b.i	PAL	P. DOAKS 2	C3	Tabasco	09.14	(Coe and Benson 1966: fig. 8)
u=te-k'e=wa	*u-tek'-e-Ø*	2IND	1.a.ii	CPN	K4655	C1	Motagua	09.17	(Linda Schele SD 1041)

tet – VER.TR.R: "to choose"

te-ta=ja	*te<h>t-aj-Ø*	1PASS	1.b.i	CPN	HS. 1 LIII	E1a	Motagua	09.16	(Barbara Fash n.p.)

til – VER.TR.R: "to burn"

K'AK' TIL=wa	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.ii	NAR	K1398	10	Central Peten	09.13	(Kerr 1989: 81)
K'AK' TIL=wa	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.ii	NAR	K2085	J1	Central Peten	09.13	(Kerr 1990: 214)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	K4464	G1	Central Peten	09.13	(Reents-Budet 1994: 99)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	K7750	B'11	Central Peten	09.17	(Grube 1998b)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	K7750	P1	Central Peten	09.17	(Grube 1998b)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	K927	J1	Central Peten	09.13	(Coe 1982: #60)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 1	C15	Central Peten	09.13	(Graham and von Euw 1975: 12)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 2	A3	Central Peten	09.13	(Graham and von Euw 1975: 13)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 2	D13	Central Peten	09.13	(Graham and von Euw 1975: 15)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 2	E19	Central Peten	09.13	(Graham and von Euw 1975: 15)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 21	A9	Central Peten	09.13	(Graham and von Euw 1975: 53)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 21	F10	Central Peten	09.13	(Graham and von Euw 1975: 54)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 22	A4	Central Peten	09.13	(Graham and von Euw 1975: 55)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 22	E7	Central Peten	09.13	(Graham and von Euw 1975: 56)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 22	H16	Central Peten	09.13	(Graham and von Euw 1975: 56)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 23	E15	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AK' ti-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	NAR	St. 23	H10	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 23	H11	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 23	H19	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 23	H2	Central Peten	09.14	(Graham and von Euw 1975: 60)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 24	C13	Central Peten	09.13	(Graham and von Euw 1975: 64)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 28	B6	Central Peten	09.12	(Graham 1978: 75)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 29	I8	Central Peten	09.14	(Graham 1978: 78)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 30	B2	Central Peten	09.14	(Graham 1978: 79)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 30	E15	Central Peten	09.14	(Graham 1978: 80)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 30	F10	Central Peten	09.14	(Graham 1978: 80)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	NAR	St. 30	H6	Central Peten	09.14	(Graham 1978: 80)
K'AK' ti-li=wi CHAN-na	*k'a[h]k'-Ø til-iw-Ø chan*	2ANTIP	1.a.i	QRG	Alt. M	D2-C3	Motagua	09.15	(Looper 2003: fig. 2.5)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	Alt. O'	Z2	Motagua	09.18	(Jones 1983)
K'AK' TIL=wi CHAN-na	*k'a[h]k'-Ø til-[i]w-Ø chan*	2ANTIP	2.e.i	QRG	St. A	D6	Motagua	09.17	(Looper 2003: fig. 5.16)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. C	D13	Motagua	09.17	(Looper 2003: fig. 5.14)
K'AK' TIL CHAN-na	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. D	A19a	Motagua	09.17	(Looper 2003: fig. 4.26)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. D	B22a	Motagua	09.17	(Looper 2003: fig. 4.26)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. D	C18a	Motagua	09.17	(Looper 2003: fig. 4.28)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. E	B18b	Motagua	09.17	(Looper 2003: fig. 4.41)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. E	C19a	Motagua	09.17	(Looper 2003: fig. 4.38)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	St. F	A7a	Motagua	09.16	(Looper 2003: fig. 4.6)
K'AK' TIL=wi CHAN-na	*k'a[h]k'-Ø til-[i]w-Ø chan*	2ANTIP	2.e.i	QRG	St. F	B13b	Motagua	09.16	(Looper 2003: fig. 4.6)
K'AK' ti-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	QRG	St. H	O2-P2	Motagua	09.16	(Looper 2003: fig. 3.19)
K'AK' ti-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	QRG	St. I	D3b	Motagua	09.18	(Looper 2001: fig. 6)
K'AK' TIL-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	QRG	St. J	C12	Motagua	09.16	(Looper 2003: fig. 3.29)

K'AK' TIL-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	QRG	St. J	E7	Motagua	09.16	(Looper 2003: fig. 3.30a)
K'AK' ti-li=wi	*k'a[h]k'-Ø til-iw-Ø*	2ANTIP	1.a.i	QRG	St. J	H6	Motagua	09.16	(Looper 2003: fig. 3.30b)
K'AK' TIL=wi	*k'a[h]k'-Ø til-[i]w-Ø*	2ANTIP	2.e.i	QRG	St. S	E1	Motagua	09.15	(Looper 2003: fig. 3.15)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	Zoo. B	16	Motagua	09.17	(Looper 2003: fig. 5.29)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	Zoo. G	A'2	Motagua	09.17	(Looper 2001: fig. 3)
K'AK' TIL=wi CHAN-na	*k'a[h]k'-Ø til-[i]w-Ø chan*	2ANTIP	2.e.i	QRG	Zoo. G	L'4b	Motagua	09.17	(Looper 2001: fig. 4)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	Zoo. P	8-B1	Motagua	09.18	(Looper 2001: fig. 30)
K'AK' TIL CHAN	*k'a[h]k'-Ø til[-iw]-Ø chan*	2ANTIP	2.g.ii	QRG	Zoo. P	C6b	Motagua	09.18	(Looper 2001: fig. 22)

tim – VER.TR.R: “to appease”

ti-mi=ye=la	*tim-y-el-Ø*	2MED	2.f.ii	PAL	HCWF	E1	Tabasco	09.11	(Robertson 1985b: fig. 374)
ti-mi=ye=la	*tim-y-el-Ø*	3NMLS	1.f.iii	PAL	HCWF	E1	Tabasco	09.11	(Robertson 1985b: fig. 374)
ti-ma=ja	*ti<h>m-aj-Ø*	1PASS	1.b.i	PAL	T18S	271b	Tabasco	09.14	(Schele and Mathews 1979: no. 539)
u=ti-mi	*u-tim-i-Ø*	2IND	1.g.i	PAL	TI-W	C3	Tabasco	09.12	(Robertson 1983b: fig. 97)
u=ti-mi	*u-tim-i-Ø*	2IND	1.g.i	PAL	TI-W	D8a	Tabasco	09.12	(Robertson 1983b: fig. 97)
u=ti-mi=je=la	*u-tim-j-el-Ø*	3NMLS	1.f.iii	PAL	TI-W	A11-A12	Tabasco	09.12	(Robertson 1983b: fig. 97)
u=ti-mi=wa	*u-tim-i-Ø*	2IND	1.a.ii	PAL	TI-W	A7	Tabasco	09.12	(Robertson 1983b: fig. 97)

tok – VER.TR.R: “to burn”

to-ka=ja	*to<h>k-aj-Ø*	1PASS	1.b.i	C Pa.	7c	E3	Yucatan	10.18	(Anders 1968: 7)

tom – VER.TR.R

to-ma=ja	*to<h>m-aj-Ø*	1PASS	1.b.i	CPN	St. A	A12b	Motagua	09.14	(Alexander 1988: fig. 1)

tum – VER.TR.R: “to consider”

u=tu-mu	*u-tum-u-Ø*	2IND	1.g.i	C Dr.	4c	A1	Yucatan	11.04	(Anders and Deckert 1975: 4)
u=tu-mu	*u-tum-u-Ø*	2IND	1.g.i	C Dr.	4c	C1	Yucatan	11.04	(Anders and Deckert 1975: 4)
u=tu-mu	*u-tum-u-Ø*	2IND	1.g.i	C Dr.	4c	E1	Yucatan	11.04	(Anders and Deckert 1975: 4)
u=tu-mu	*u-tum-u-Ø*	2IND	1.g.i	C Dr.	5c	A1	Yucatan	11.04	(Anders and Deckert 1975: 5)

tun – NOUN: “stone”

tu-na=ja=ka	*tun-aj-ak-Ø*	1INCH	4.a.i	CHN	MON-L7	C2	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 61)

tup – NOUN: “earflare”

tu-pa=ja	*tup-aj*	1ABSL	1.c.i	PAL	TI-E	T5	Tabasco	09.12	(Robertson 1983b: fig. 95)
tu-pa=ja	*tup-aj*	1ABSL	1.c.i	PAL	TI-M	A9	Tabasco	09.12	(Robertson 1983b: fig. 96)

tut – VER.TR.R: "to renovate, to visit"

tu=ji=ya	*tu<h>[t]-j-Ø=iy*	1PASS	2.f.ii	ALS	P. 1	C4	Pasion	09.10	(Eberl 2007: fig. A2.1)
tu-ta=ja	*tu<h>t-aj*	1PASS	1.b.i	BPK	ScS. 5	L2	Usumacinta	09.16	(Alexandre Safronov n.p.)
[2]**tu=ji=ya**	*tu<h>t-j-Ø=iy*	1PASS	2.f.ii	BPK	ScS. 5	L5	Usumacinta	09.16	(Alexandre Safronov n.p.)
tu-ta=ji	*tu<h>t-aj*	1PASS	1.b.ii	EKB	M. 96G	X1	Yucatan	09.16	(Lacadena 2002: fig. 18d)

t'ab – VER.TR.R: "to ascend, to inaugurate"

T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	ALH	K2993	B1	Hondo	?	(Kerr 1992: 376)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	ALS	K3120	F1	Central Peten	09.16	(Velásquez García 2009b: fig. 9a)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	ALS	St. 5	C1	Pasion	09.10	(Alexander Voß n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	BPK	ScS. 2	A8	Usumacinta	09.08	(Arellano Hernández 1998: fig. 16)
T'AB PA'=CHAN[na]	*t'ab-[ay-i]-Ø pa' chan*	2MED	2.g.ii	BPK	ScS. 4	C5	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	BPT	Bur. 2 Msc. 2	B1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5a)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	BPT	Ca. 1 Msc. 5	B1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5b)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	BPT	Msc. Min. Vase	B1	Mopan-Pusilha	09.17	(Grube and Martin 2004: 67)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	BVC	Bu. 88-1-2 Bone	B1-B2	Mopan-Pusilha	09.18	(Helmke et al. 2008: fig. 4)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	BVC	K2730	B1	Mopan-Pusilha	?	(Kerr 1990: 276)
T'AB=ya	*t'ab-[a]y-Ø*	2MED	2.e.i	CAY	Lnt. 1	C12	Usumacinta	09.17	(John Montgomery n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CAY	Lnt. 1	D14	Usumacinta	09.17	(John Montgomery n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CMA	K578	A2	Southern Peten	?	(Coe 1978: #10)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CML	U. 26 Sp. 14	A1	Tabasco	09.17	(Marc Zender n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CNC	P. 3	C2	Southern Peten	09.16	(Harri Kettunen n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	Berlin Ca 44342	B1	?	?	(Grube and Gaida 2006: #2)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K517	B1	Central Peten	?	(Coe 1978: #15)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K532	B1	?	?	(Kerr 1989: 18)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K554	D1	?	?	(Schele and Miller 1986: pl. 48a)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K555	C1	?	?	(Coe 1978: #8)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K623	B1	?	?	(Kerr 1989: 25)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K625	B1	?	?	(Kerr 1989: 27)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K764	D1	?	?	(Kerr 1989: 45)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K774	B1	?	?	(Kerr 1989: 47)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K1080	A2	?	?	(Robicsek and Hales 1982: #53)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1211	B1	?	?	(Coe 1982: #58)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1377	C1	?	?	(Robicsek and Hales 1982: fig. 31b)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1392	B1	Southern Peten	?	(Kerr 1989: 80)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1485	C1	?	?	(Kerr 1989: 90)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1522	C1	?	?	(Robicsek and Hales 1982: #66)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1560	B1	?	?	(Kerr 1989: 98)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1775	C1	?	?	(Kerr 1989: 109)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1792	C1	?	?	(Kerr 1989: 113)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1892	B1	?	?	(Robicsek and Hales 1982: #117)

T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1901	B1	?	?	(Kerr 1989: 126)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1921	B1	?	?	(Kerr 1990: 193)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1921	C1	?	?	(Kerr 1990: 193)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K1941	B1	Central Peten	?	(Kerr 1990: 194)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2206	B1	Southern Peten	?	(Kerr 1990: 219)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2292	D1	?	?	(Kerr 1990: 230)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K2292	Q1	?	?	(Kerr 1990: 230)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2295	B1	Central Peten	?	(Kerr 1990: 233)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2352	B1	Southern Peten	?	(Kerr 1990: 240)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2358	B1	Central Peten	?	(Kerr 1990: 242)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2695	B1	?	?	(Kerr 1990: 255)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K2777	B1	Central Peten	?	(Schele and Miller 1986: pl. 73a)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K2787	B1	?	?	(Kerr 1990: 292)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3025	A2	Central Peten	?	(Kerr 1992: 379)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3026	B2	?	?	(Kerr 1992: 380)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K3034	B1	Hondo	?	(Reents-Budet 1994: 201)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3046	B1	?	?	(Barbara van Heusen n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3055	B1	?	?	(Persis Clarkson n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3059	B1	?	?	(Jim Crocker)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3066	B1	Central Peten	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3230	B1	Central Peten	?	(Kerr 1992: 394)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K3385	B1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K3412	D1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3478	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3699	C1	?	?	(Kerr 1992: 429)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K3842	A2	?	?	(Kerr 1992: 442)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4018	B1	Southern Peten	?	(Kerr 1992: 452)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4020	A2	?	?	(Kerr 1992: 454)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4021	C1	?	?	(Kerr 1992: 455)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4030	pA1	?	?	(Kerr 1992: 456)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4336	A2	?	?	(Kerr 1992: 307)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4336	B2	?	?	(Kerr 1992: 307)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4340	D1	?	09.14	(Kerr 1992: 474)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4375	B1	?	?	(Kerr 1992: 481)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4379	B1	?	?	(Kerr 1992: 484)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4619	B1	Central Peten	?	(Kerr 1994: 564)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4669	B1	Central Peten	09.15	(Kerr 1994: 582)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4681	B1	Hondo	?	(Kerr 1994: 586)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4681	L1	Hondo	?	(Kerr 1994: 586)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4689	B1	?	?	(Kerr 1994: 592)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4824	B1	?	?	(Kerr 1994: 600)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4945	B1	?	?	(Kerr 1994: 621)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K4946	B1	?	?	(Justin Kerr n.p.)

T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4992	B1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K4995	B1	Central Peten	?	(Kerr 1994: 639)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5006	B1	?	?	(Kerr 1994: 645)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5016	C1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5062	C1	?	?	(Kerr and Kerr 2000: 916)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5070	C1	?	?	(Kerr and Kerr 2000: 919)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5176	B1	?	?	(Kerr and Kerr 1997: 765)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5229	B1	Central Peten	?	(Kerr and Kerr 1997: 777)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5241	B1	Central Peten	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5356	B1	Central Peten	?	(Reents-Budet 1994: 185)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5390	B1	?	?	(Kerr and Kerr 2000: 930)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5446	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5454	C1	?	?	(Kerr and Kerr 1997: 805)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5503	C1	?	?	Coe 1973: #28
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5605	A2	Southern Peten	?	(Kerr and Kerr 1997: 811)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5605	B2	Southern Peten	?	(Kerr and Kerr 1997: 811)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5629	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5635	B1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K5646	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5648	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5658	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5720	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5722	B1	Central Peten	?	(Kerr and Kerr 1997: 819)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5763	A2	?	?	(Kerr and Kerr 2000: 937)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5764	B1	?	?	(Kerr and Kerr 2000: 938)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5838	C1	?	?	Reents-Budet 1994, 36
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5847	C1	?	?	(Kerr and Kerr 2000: 943)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5857	C1	?	?	(Kerr and Kerr 1997: 821)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5940	B1	?	?	(Kerr and Kerr 2000: 945)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5976	A1	Central Peten	?	(Kerr and Kerr 2000: 950)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K5977	B1	Central Peten	?	(Kerr and Kerr 2000: 951)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K6059	B1	?	?	(Kerr and Kerr 1997: 825)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6060	A1	Central Peten	?	(Kerr and Kerr 1997: 826)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K6066	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6167	B1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K6290	A2	Southern Peten	?	(Kerr and Kerr 2000: 955)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6418	B1	Central Peten	?	(Kerr and Kerr 2000: 963)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6434	A2	Southern Peten	?	(Kerr and Kerr 2000: 966)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6436	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6659	C1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6755	B1	Central Peten	?	(Kerr and Kerr 2000: 978)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6814	C1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6999	A2	Southern Peten	?	(Justin Kerr n.p.)

T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K6999	B2	Southern Peten	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7055	B1	Central Peten	?	(Krempel and Matteo 2012: fig. 5d)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7190	B1	?	?	(Kerr and Kerr 2000: 990)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7224	B1	Southern Peten	?	(Kerr and Kerr 2000: 992)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7265	B1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K7268	B1	?	?	(Kerr and Kerr 2000: 994)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7459	B1	Central Peten	?	(Krempel and Matteo 2012: fig. 10d)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7460	C1	?	?	(Kerr and Kerr 2000: 998)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K7461	A1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7602	B1	Southern Peten	?	(Kerr and Kerr 2000: 1000)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7694	B1	?	?	(Kerr and Kerr 2000: 1002)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7720	A2	Central Peten	?	(Kerr and Kerr 2000: 1004)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7786	B1	Central Peten	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K7797	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7821	C1	?	?	(Kerr and Kerr 2000: 1010)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K7912	B1	?	?	(Kerr and Kerr 2000: 1011)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K8088	B1	Central Peten	?	(Justin Kerr n.p.)
T'AB	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8123	A2	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8220	A1	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K8234	C1	?	?	(Kerr and Kerr 2000: 1020)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8417	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8457	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8497	A2	?	?	(Justin Kerr n.p.)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	COL	K8526	B1	Central Peten	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8622	B1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8622	O1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8685	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8719	C1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	K8732	B1	?	?	(Justin Kerr n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	MNAE 15889	B1	Central Peten	?	(Sven Gronemeyer DSC04447)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	Mus. Sta. Barbara	B1	?	?	(Sven Gronemeyer 23-000015)
T'AB tu=CH'EN[na]	*t'ab-[ay-i]-Ø t-u-ch'en*	2MED	2.g.ii	COL	P. Houston	F7	Usumacinta	09.03	(Mayer 1984: pl. 27)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	P. Stendahl	D6b	Usumacinta	09.14	(Bíró 2005: fig. 6)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	PMA 10.422277	B1	Central Peten	?	(Boot 2004a: fig. 2)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	Soth. NY Lot 171	C1	?	?	(Sebastian Matteo n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	St. Randel	I3	Usumacinta	10.01	(Miller and Martin 2004: 167)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	COL	Trn. Amparo	D1	?	?	(Zender 2005b: fig. 9)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CPN	Alt. K	I2a	Motagua	09.12	(Grube and MacLeod 1989: fig. 1)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CPN	Alt. Q	F1	Motagua	09.17	(Schele 1989a: fig. 1)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	CPN	Alt. Z	B3	Motagua	09.17	(Maudslay 1974, I: pl. 112)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	CPN	Jd. Comayagua	B2	Tabasco	09.17	(Mayer 1997: fig. 19)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CPN	Str. 10K Hbh.	A1	Motagua	09.16	(Linda Schele 66033)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	CPN	T. 11 sub Step	B1	Motagua	09.06	(Schele 1990b: fig. 8)

T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CRC	C17P	23-8	Mopan-Pusilha	09.18	(Grube 1994a: fig. 9.16d)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CRC	Str. 4L6 Vessel	B1	Mopan-Pusilha	09.15	(Chase and Chase 1987: fig. 38)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CRN	El Jobillo Gr. 2	B1	Central Peten	09.15	(Guzmán 2012: fig. 4.13)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	CRN	HS. 2 XI	A1a	Central Peten	09.14	(Sebastian Matteo n.p.)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	CRN	Msc. 06-2011/PH	B1a	Central Peten	09.12	(Boot 2011: fig. 1)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 E IV	E1b	Pasion	09.12	(Fahsen 2002: fig. 7)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 E V	E2b	Pasion	09.12	(Fahsen 2002: fig. 7)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W IV	C2a	Pasion	09.12	(Fahsen 2002: fig. 8)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W V	F2a	Pasion	09.12	(Fahsen 2002: fig. 8)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W VI	F2a	Pasion	09.12	(Fahsen 2002: fig. 8)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	EDZ	BcR. 1	pD1	Yucatan	09.13	(Benavides and Gronemeyer 2005: fig. 2)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	EKB	M. R22	B1	Yucatan	09.17	(Lacadena 2002: fig. 22a)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	ESP	BCm. 1	12	Chiapas	09.07	(Kowalski 1989: fig. 1)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	FLD	St. 8	C2	Western Peten	09.16	(Guido Krempel n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	FLD	St. 8	C7	Western Peten	09.16	(Guido Krempel n.p.)
t'a?-ba=yi	*t'ab-ay-i-Ø*	2MED	1.a.ii	IKL	Lnt. 1	B1	Yucatan	?	(Bíró 2003: fig. 1)
T'AB=ya	*t'ab-[a]y-Ø*	2MED	2.e.i	KNK	Lnt. 1	B1	Yucatan	09.15	(Graña-Behrens 2002: pl. 4)
T'AB=ya	*t'ab-[a]y-Ø*	2MED	2.e.i	LAG	St. 2	A5	Tabasco	09.14	(Eric von Euw n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	LBT	BcM. 2	C1	Mopan-Pusilha	09.17	(Wanyerka 2003: fig. 4)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	LBT	Msc. 2	A1	Mopan-Pusilha	?	(Wanyerka 2003: fig. 6)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MS	1838	B1	?	?	(Sebastian Matteo n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MTL	K2573	B1	Central Peten	09.15	(Kerr 1990: 245)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MTL	K4996	B1	Central Peten	09.15	(Kerr 1994: 640)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MTL	K8176	B1	Central Peten	?	(Kerr and Kerr 2000: 1018)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MTL	K8176	N1	Central Peten	?	(Kerr and Kerr 2000: 1018)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	MTL	K8286	B1	Central Peten	09.15	n/a
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K1398	2	Central Peten	09.13	(Kerr 1989: 81)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	NAR	K1558	B1	Central Peten	09.07	(Robicsek and Hales 1982: fig. 32)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K1698	B1	Central Peten	?	(Kerr 1989: 104)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K2085	B1	Central Peten	09.13	(Kerr 1990: 214)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K2796	B1	Central Peten	?	(Coe 1973: #49)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K4464	B1	Central Peten	09.13	(Reents-Budet 1994: 99)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K4562	B1	Central Peten	09.05	(Kerr 1994: 553)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	NAR	K4958	B1	Central Peten	?	(Kerr 1994: 624)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K5042	B1	Central Peten	09.05	(Kerr and Kerr 1997: 746)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	NAR	K5458	B1	Central Peten	09.03	(Reents-Budet 1994: 82)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K633	B1	Central Peten	09.16	(Reents-Budet 1994: 63)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K633	R4	Central Peten	09.16	(Reents-Budet 1994: 63)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K633	S4	Central Peten	09.16	(Reents-Budet 1994: 63)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K633	T4	Central Peten	09.16	(Reents-Budet 1994: 63)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K7716	B1	Central Peten	09.08	(Kerr and Kerr 2000: 1003)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K7750	B1	Central Peten	09.17	(Grube 1998b)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NAR	K927	B1	Central Peten	09.13	(Coe 1982: #60)

T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NMP	St. 2	J1	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	NTN	Dwg. 51	A1	Mopan-Pusilha	?	(MacLeod and Stone 1994: fig. 7.24)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	OXK	Lnt. 13	A5	Yucatan	09.02	(García Campillo and Lacadena 1990: fi. 4)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	OXP	St. 10	B2	Central Campeche	09.16	(Grube 2008: fig. 8.34)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PAL	T12JD	B1	Tabasco	09.13	(Grube, Martin and Zender 2002: 36)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PAL	TC	C10	Tabasco	09.12	(Robertson 1991: fig. 9)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PAL	TFC	M6	Tabasco	09.12	(Robertson 1991: fig. 153)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	PAL	TI-W	R4	Tabasco	09.12	(Robertson 1983b: fig. 97)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PAL	TS	O8	Tabasco	09.12	(Robertson 1991: fig. 95)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PMT	Mon. 7	pA2	Tabasco	09.13	(Ian Graham n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PNG	Bur. 13 Stucco	A1a	Usumacinta	09.16	(Houston et al. 1998: fig. 3)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PNG	Msc. 16	A2	Usumacinta	09.14	(Teufel 2004: 562)
t'a?-T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PNG	Msc. Peabody	A5b	Usumacinta	09.15	(Maler 1901: pl. 11)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PNG	P. 7	Z21	Usumacinta	09.10	(Teufel 2004: 504)
T'AB=ya	*t'ab-[a]y-Ø*	2MED	2.e.i	PNG	St. 12	D8a	Usumacinta	09.18	(Stuart and Graham 2003: 62)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PNG	Trn. 1	C'1	Usumacinta	09.17	(Teufel 2004: 549)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	PUS	K8089	D1	Mopan-Pusilha	?	(Kerr and Kerr 2000: 1017)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	RAM	Alt. 1	B2	Motagua	09.10	(Schele 1987c: fig. 2)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	RAZ	7524	B1	Central Peten	?	(Kerr and Kerr 2000: 999)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	RAZ	Babylas	B1	Central Peten	?	(Sebastian Matteo n.p.)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	RAZ	IDAEH Cer. 34-4	pB1	Central Peten	?	(Sven Gronemeyer DSC03766)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	RAZ	K3744	B1	Central Peten	?	(Kerr 1992: 433)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	SAA	K558	B1	Southern Peten	?	(Reents-Budet 1994: 257)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	SBL	P. 1	A1	Pasion	10.00	(Mayer 1995: pl. 44)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	SRX	St. 6	B3	Central Campeche	10.03	(Graña-Behrens 2002: pl. 134)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	K1261	B	Central Peten	09.08	(Martin and Grube 2000: 40)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	K4961	B1	Central Peten	09.08	n/a
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	K4976	B1	Central Peten	?	(Kerr 1994: 634)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	K4976	Q2	Central Peten	?	(Kerr 1994: 634)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	MT 293	B1	Central Peten	?	n/a
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	MT 61	B1	Central Peten	09.15	n/a
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	TIK	MT. 140	B1	Central Peten	09.03	(Culbert 1993: fig. 108d)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	MT. 16	B1	Central Peten	09.06	(Culbert 1993: fig. 42c)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	TIK	MT. 5	B1	Central Peten	08.18	(Culbert 1993: fig. 19b)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	St. 31	E5	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TIK	St. 39	Bp4a	Central Peten	08.17	(Schele and Freidel 1990: fig. 4.14)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TNA	Bx. Grolier 7	D1	Chiapas	09.16	(Peter Mathews n.p.)
i T'AB=yi	*i['] t'ab-[a]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 146	D1	Chiapas	09.17	(Graham and Henderson 2006: 79)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	TNA	Msc. 6	A5	Chiapas	09.18	(Sven Gronemeyer 39-000014)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TPX	Veracal Sherd	B1	Central Peten	?	(Hermes 2000: fig. 141.4)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	TSL	St. 3	pA2	Central Peten	?	(Alexandre Tokovinine n.p.)
t'aT'AB-ba	*t'ab-a[y]-Ø*	2MED	1.g.i	UXM	Cst. 2	C1	Yucatan	10.03	(Graham 1992: 141)
T'AB=ya	*t'ab-[a]y-Ø*	2MED	2.e.i	XLM	Col. 1	B5	Yucatan	09.15	(Graham and von Euw 1992: 173)

T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K1547	B1	Central Peten	?	(Robicsek and Hales 1982: #184)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K1837	B1	Central Peten	?	(Kerr 1989: 116)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K3743	B1	Central Peten	09.16	(Kerr 1992: 432)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K4388	B1	Central Peten	09.16	(Kerr 1992: 488)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K4909	B1	Central Peten	09.16	(Kerr 1994: 610)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K8007	B1	Central Peten	09.16	(Kerr and Kerr 2000: 1012)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K8015	B1	Central Peten	?	n/a
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	XUL	K8728	B1	Central Peten	09.16	(Krempel and Matteo 2012: fig. 4)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 24	H1	Usumacinta	09.14	(Graham and von Euw 1977: 53)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 25	O2	Usumacinta	09.14	(Graham and von Euw 1977: 56)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	YAX	Lnt. 26	O3	Usumacinta	09.14	(Graham and von Euw 1977: 57)
T'AB	*t'ab-[ay-i]-Ø*	2MED	2.g.ii	ZBP	K1387	B1	Western Peten	?	(Robicsek and Hales 1982: #170)
T'AB=yi	*t'ab-[a]y-i-Ø*	2MED	2.e.ii	ZBP	K3636	B1	Western Peten	09.11	(Barbara van Heusen n.p.)

t'ox – VER.TR.R: "to divide (up)"

t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 1	A3	Tabasco	09.16	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 2	A1	Tabasco	09.16	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 3	A3	Tabasco	09.16	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 4	A3	Tabasco	09.16	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 9	A3	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 10	A3	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 11	A4	Tabasco	09.17	(Marc Zender n.p.)
i t'o-xa=ja	*i['] t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 13	Ap4	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 15	A3	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 16	A3	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 17	A3	Tabasco	09.17	(Marc Zender n.p.)
t'o-xa=ja	*t'o<h>x-aj-Ø*	1PASS	1.b.i	CML	U. 26 Pdt. 18	A3	Tabasco	09.17	(Marc Zender n.p.)

tzak – VER.TR.R: "to conjure, to grab"

TZAK-ka=ji	*tza<h>k-aj-Ø*	1PASS	1.d.ii	CHN	CC-HB	20	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
tza-ka=ja	*tza<h>k-aj-Ø*	1PASS	1.d.i	COL	St. Brussels	A17	Usumacinta	09.08	(Mayer 1995: pl. 74)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	COL	K1382	C1	?	?	(Robicsek and Hales 1982: #12)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	COL	K2208	D1	?	?	(Kerr 1990: 221)
i TZAK=ja K'AWIL[la]	*i['] tza<h>k-[a]j-Ø k'awil*	1PASS	2.e.i	CPN	St. I	C1	Motagua	09.12	(Schele 1987f: fig. 2)
TZAK=ji=ya	*tza<h>k-j-Ø=iy*	1PASS	2.f.ii	CRN	HS. 2 1-IX	B1	Central Peten	09.12	(David Stuart n.p.)
i TZAK=ja	*i['] tza<h>k-[a]j-Ø*	1PASS	2.e.i	NAR	Alt. 1	B9	Central Peten	09.08	(Graham 1978: 104)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	PAL	HEM1	pU1	Tabasco	09.14	(Seler 1915: fig. 123)
9 TZAK=ja	*9 tza<h>k-[a]j-Ø*	1PASS	2.e.i	QRG	St. J	E5	Motagua	09.16	(Looper 2003: fig. 3.30a)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	RAZ	K1383	F1	Central Peten	?	(Kerr 1989: 78)
TZAK=ja=na	*tza<h>k-j-an-Ø*	1PASS	2.f.ii	YAX	HS. 3 V	D7	Usumacinta	09.15	(Graham 1979: 171)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	YAX	Lnt. 14	D2	Usumacinta	09.15	(Graham and von Euw 1977: 37)

TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	YAX	Lnt. 15	A2	Usumacinta	09.16	(Graham and von Euw 1977: 39)
TZAK=ji=ya	*tza<h>k-j-Ø=iy*	1PASS	2.f.ii	YAX	Lnt. 25	M1	Usumacinta	09.14	(Graham and von Euw 1977: 56)
TZAK=ja	*tza<h>k-[a]j-Ø*	1PASS	2.e.i	YAX	St. 35	D2	Usumacinta	09.15	(Karen Bassie n.p.)
TZAK=wi=ya	*tzak-w-Ø=iy*	2ANTIP	2.f.ii	CPN	St. 6	C5	Motagua	09.12	(McCready et al. 1988: fig. 2)
TZAK=wi=ya	*tzak-w-Ø=iy*	2ANTIP	2.f.ii	CRN	HS. 3 IV	B3	Central Peten	09.13	(Mayer 1991: pl. 130)
TZAK=wa K'UH	*tzak-[a]w-Ø k'uh*	2ANTIP	2.e.i	PAL	TS	O13	Tabasco	09.12	(Robertson 1991: fig. 95)
TZAK=wi	*tzak-[a]w-Ø*	2ANTIP	2.e.ii	QRG	Zoo. P	R2b	Motagua	09.18	(Looper 2001: fig. 24)
TZAK=wi	*tzak-[a]w-Ø*	2ANTIP	2.e.ii	QRG	Zoo. P	R2b	Motagua	09.18	(Looper 2001: fig. 24)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	CNC	P. 1	I9	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	CNC	P. 1	M3	Southern Peten	09.18	(Yuriy Polyukhovych n.p.)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	CPN	St. 8	C2b	Motagua	09.17	(Maudslay 1974, I: pl. 109)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	CRC	St. 22	I12	Mopan-Pusilha	09.10	(Grube and Martin 2004: 34)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	ENC	St. 1	B8	Central Peten	08.13	(Jones and Satterthwaite 1982: fig. 77)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	PAL	TC	O9a	Tabasco	09.12	(Robertson 1991: fig. 9)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	YAX	Lnt. 25	B1a	Usumacinta	09.14	(Graham and von Euw 1977: 55)
u=TZAK=wa	*u-tzak[-a]-Ø*	2IND	2.e.i	YAX	Lnt. 38	A2	Usumacinta	09.16	(Graham 1979: 85)
u=TZAK-ka=ji	*u-tzak-aj-Ø*	4TEMP	1.d.ii	HLK	Lnt. 1	A4	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 43)
u=tza-ka=ja	*u-tzak-aj-Ø*	4TEMP	1.d.i	YAX	Alt. 22	H1	Usumacinta	09.15	(Mathews 1988: fig. 6.19b)

tzih – ADJ: "fresh"

ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	AGT	IDAEH Cer. 56-6	pD1	Pasion	?	(Sven Gronemeyer DSC03884)
ta tzi-ji=li wa	*ta tzi[h]-il [kaka]w*	1ATTR	1.a.i	CMA	K578	D1-E1	Southern Peten	?	(Coe 1978: #10)
tzi ka-wa	*tzi[h]-[il] ka[ka]w*	1ATTR	2.g.ii	COL	Berlin Ca 44342	D1	?	?	(Grube and Gaida 2006: #2)
ti tzi-hi=li	*ti tzih-i[l]*	1ATTR	1.a.i	COL	Berlin Ca 44347	H1-I1	Yucatan	?	(Grube and Gaida 2006: #27)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K504	F1	?	?	(Kerr and Kerr 1997: 729)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K1092	I1-J1	?	?	(Kerr 1989: 58)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K1211	F1	?	?	(Robicsek and Hales 1982: #55)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K1901	K1	?	?	(Kerr 1989: 126)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K2026	G1	?	?	(Kerr 1990: 205)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K2068	G1	Central Peten	?	(Kerr 1990: 211)
ti tzi	*ti tzi[h-il]*	1ATTR	2.g.ii	COL	K3390	I1	Central Peten	?	(Justin Kerr n.p.)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K3478	G1	?	?	(Justin Kerr n.p.)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K3684	F1	?	?	(Kerr 1992: 427)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K3924	M1	?	?	(Kerr 1992: 446)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K4020	A4	?	?	(Kerr 1992: 454)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K4357	M1	Central Peten	?	(Kerr 1992: 477)
ti tzi	*ti tzi[h-il]*	1ATTR	2.g.ii	COL	K4375	I1	?	?	(Kerr 1992: 481)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K4467	A2	?	?	(Kerr 1990: 312)
tzi-hi=la	*tzih-il*	1ATTR	1.a.ii	COL	K4477	A3	?	?	(Kerr 1990: 314)
ti tzi-hi=li	*ti tzih-i[l]*	1ATTR	1.a.i	COL	K4542	A3-A4	?	?	(Kerr 1990: 317)
tzi-hi=li	*tzih-il*	1ATTR	1.a.i	COL	K4550	B1	?	?	(Kerr 1994: 551)
ta tzi-hi=li	*ta tzih-i[l]*	1ATTR	1.a.i	COL	K4684	E1	Yucatan	?	(Kerr 1994: 589)

tzi-hi=la	*tzih-il*	1ATTR	1.a.ii	COL	K4988	K1	?	?	(Kerr 1994: 635)
ta tzi	*ta tzi[h-il]*	1ATTR	2.g.ii	COL	K5006	H1	?	?	(Kerr 1994: 645)
ta tzi	*ta tzi[h-il]*	1ATTR	2.g.ii	COL	K5070	L1	?	?	(Kerr and Kerr 2000: 919)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K5110	A3	?	?	(Kerr and Kerr 1997: 756)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K5357	B1	?	?	(Kerr and Kerr 1997: 784)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K5391	G1	Central Peten	?	(Kerr and Kerr 2000: 931)
ta tzi	*ta tzi[h-il]*	1ATTR	2.g.ii	COL	K5446	I1	?	?	n/a
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K5509	P1	?	?	(Coe 1973: #38)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K5567	G1	Central Peten	?	n/a
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K5635	H1	?	?	n/a
ti tzi	*ti tzi[h-il]*	1ATTR	2.g.ii	COL	K5646	H1	?	?	n/a
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K6055	C1	Yucatan	?	n/a
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K6294	A6	?	?	(Kerr and Kerr 2000: 957)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K6551	G1	Central Peten	?	(Grube and Gaida 2006: fig. 33.2)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K6555	C1	Yucatan	?	(Justin Kerr n.p.)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K6618	M1	Central Peten	?	(Justin Kerr n.p.)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K6998	H1	Yucatan	?	(Kerr and Kerr 1997: 837)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K7055	F1	Central Peten	?	(Krempel and Matteo 2012: fig. 5d)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K7146	A2	Yucatan	?	(Kerr and Kerr 2000: 984)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K7190	H1	?	?	(Kerr and Kerr 2000: 990)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	COL	K7459	F1	Central Peten	?	(Krempel and Matteo 2012: fig. 10d)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	COL	K7727	L1	?	?	(Kerr and Kerr 2000: 1005)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K8393	L1	Central Peten	?	(Justin Kerr n.p.)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	COL	K8732	B4	?	?	(Justin Kerr n.p.)
u=tzi-hi	*u-tzih-i[l] [kakaw?]*	1ATTR	1.g.i	COL	MFA 1988.1284	F1	Central Peten	?	(Boot 2009a: fig. 1)
ti tzi-ji=la	*ti tzi[h]-il*	1ATTR	1.a.ii	MTL	K1728	I1	Central Peten	09.16	(Kerr 1989: 105)
tzi-hi	*tzih-i[l]*	1ATTR	1.g.i	MTL	K8176	F1	Central Peten	?	(Kerr and Kerr 2000: 1018)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	RAZ	IDAEH Cer. 34-4	pB1	Central Peten	?	(Sven Gronemeyer DSC03767)
ta tzi ka-wa	*ta tzi[h]-[il] ka[ka]w*	1ATTR	2.g.ii	UAX	Canberra Tripod	B4	Central Peten	?	(Peter Mathews n.p.)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	XUL	K3743	F1	Central Peten	?	(Kerr 1992: 432)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	XUL	K4388	F1	Central Peten	09.16	(Kerr 1992: 488)
ti tzi-hi	*ti tzih-i[l]*	1ATTR	1.g.i	XUL	K4572	G1	Central Peten	?	(Kerr 1994: 555)
ta tzi	*ta tzi[h-il]*	1ATTR	2.g.ii	ZBP	K1387	H1	Western Peten	?	(Robicsek and Hales 1982: #170)
ta tzi-hi	*ta tzih-i[l]*	1ATTR	1.g.i	ZTZ	K679	B1	Central Peten	?	(Kerr 1989: 33)

tzik – VER.TR.R: "to count / to venerate"

tzi-ka=ja	*tzi<h>k-aj-Ø*	1PASS	1.b.i	CPN	Alt. H'	M2	Motagua	09.12	(Boot 2009b: 174)

tzol – VER.TR.R: "to order"

u=tzo-lo=wa	*u-tzol-o-Ø*	2IND	1.a.ii	TRT	Mon. 6	K11	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)

tzutz – VER.TR.R: "to replant, to sow"

TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	AGT	St. 5	C2	Pasion	09.13	(Houston and Mathews 1985: fig. 19)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	ARP	St. 2	C1	Pasion	09.15	(Houston and Mathews 1985: fig. 11)
^{2}**tzu=ja**	*tzu<h>tz-[a]j-Ø*	1PASS	2.a.i	CAY	Alt. 4	A2	Usumacinta	09.15	(Mathews 1998: fig. 1)
TZUTZ=ja=ya	*tzu<h>tz-j-Ø=[i]y*	1PASS	2.f.ii	CLK	St. 89	D6	Central Campeche	09.15	(Mayer 1989: pl. 7)
tzu-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	COL	Col. Saint Louis	D1	Usumacinta	09.14	(Liman and Durbin 1975: fig. 2)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	CPN	St. A	A12b	Motagua	09.14	(Alexander 1988: fig. 1)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CPN	St. B	B5	Motagua	09.15	(Barbara Fash n.p.)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	CPN	St. J	B1a	Motagua	09.13	(Linda Schele SD 1016)
TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	CPN	St. J	W 14	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CPN	St. P	A7a	Motagua	09.09	(Schele and Stuart 1986a: fig. 3)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CPN	St. 2	C6b	Motagua	09.11	(Maudslay 1974, I: pl. 102)
u=TZUTZ=ja	*u-tzu<h>tz-[a]j-Ø-Ø*	1PASS	2.e.i	CPN	St. 4	C7a	Motagua	09.15	(Schele 1987f: fig. 5)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	CPN	Mon. 39	J1a	Motagua	09.09	(Linda Schele 46030)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CPN	Mon. 49	J1a	Motagua	09.11	(Schele 1987b: fig. 2)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CRC	St. 14	B7	Mopan-Pusilha	09.06	(Beetz and Satterthwaite 1981: fig. 14a)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	CRN	Alt. 1	pD2	Central Peten	09.11	(Canuto et al. 2008: fig. 2.12)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	CRN	HS. 2 1-VII	Gp1	Central Peten	09.14	(David Stuart n.p.)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	DPL	St. 5	O1	Pasion	09.15	(Houston 1993: fig. 3.12)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	EDZ	St. 19	A4-B4	Yucatan	09.13	(Carlos Pallán n.p.)
TZUTZ-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	LAC	St. 7	B10	Usumacinta	09.09	(Alexandre Safronov n.p.)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	LGP	Alt. 1	E5	Western Peten	09.16	(Ian Graham n.p.)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	MQL	St. 2	K7a	Southern Peten	09.18	(Graham 1967: fig. 47)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	MRL	St. 2	F8	Tabasco	09.15	(Pavón n.p.)
TZUTZ=jo=mo	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	NAR	Alt. 1	K6-J7	Central Peten	09.08	(Graham 1978: 104)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	NSY	St. 1	B8b	Yucatan	09.12	(Mayer 1995: pl. 111)
tzu-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	OAG	Alt. 1	C1	Usumacinta	09.10	(Mayer 1995: pl. 92)
TZUTZ=ho=ma	*tzu<h>tz-[j]-om-Ø*	1PASS	2.f.ii	PAL	HCPD	M-1	Tabasco	09.11	(Robertson 1985a: fig. 238)
i TZUTZ=ja	*i[']* *tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	PAL	TFC	C7	Tabasco	09.12	(Robertson 1991: fig. 153)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	PMT	P. X	pB1	Tabasco	09.14	(Lizardi Ramos 1963: fig. 6)
tzu-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	PMT	P. 1	pE5	Tabasco	09.17	(Schele and Miller 1986: fig. III.2)
tzu=ja	*tzu<h>[tz]-[a]j-Ø*	1PASS	2.g.ii	PMT	P. 1	pL5	Tabasco	09.17	(Schele and Miller 1986: fig. III.2)
2tzu=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	PMT	Mon. 8	pD1	Tabasco	09.13	(Bíró 2011a: fig. 228)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	PNG	Alt. 1	N'5b	Usumacinta	09.13	(Teufel 2004: 535)
^{2}**tzu=ja**	*tzu<h>tz-[a]j-Ø*	1PASS	2.a.i	PNG	P. 3	F2	Usumacinta	09.17	(Schele and Mathews 1991: fig. 10.3)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	PNG	St. 8	B'20	Usumacinta	09.14	(Stuart and Graham 2003: 48)
^{2}**tzu=ja**	*tzu<h>tz-[a]j-Ø*	1PASS	2.a.i	PNG	St. 8	S2	Usumacinta	09.14	(Stuart and Graham 2003: 44)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	PRU	St. 15	E8	Central Peten	08.19	(Guenter and Rich 2003: fig. 1)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	PUS	St. P	A9	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 17)
^{2}**tzu=ja**	*tzu<h>tz-[a]j-Ø*	1PASS	2.a.i	PUS	St. E	Ap12	Mopan-Pusilha	09.15	(Prager 2002a, III: fig. 7)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	QRG	Alt. M	A2a	Motagua	09.15	(Looper 2003: fig. 2.5)
TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	QRG	St. A	C1	Motagua	09.17	(Looper 2003: fig. 5.16)

TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	QRG	St. FF	C14a	Motagua	09.16	(Looper 2003: fig. 4.5)
TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	QRG	St. E	D12a	Motagua	09.17	(Looper 2003: fig. 4.38)
TZUTZ=ji=ya	*tzu<h>tz-j-Ø=iy*	1PASS	2.f.ii	QRG	St. E	D15a	Motagua	09.17	(Looper 2003: fig. 4.38)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	QRG	Str. 1B-1	X1b	Motagua	09.19	(Schele and Looper 1996: 186)
TZUTZ-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	TAM	St. 2	C4	Pasion	09.06	(Gronemeyer 2013: pl. 5)
i TZUTZ=ja	*i['] tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	TAM	St. 4	Cp8	Pasion	09.06	(Gronemeyer 2013: pl. 11)
i tzu-tza=ja	*tzu<h>tz-aj-Ø*	1PASS	1.a.i	TNA	Mon. 173	A2-A3	Chiapas	09.09	(Graham and Henderson 2006: 118)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	TRT	Mon. 6	A18	Tabasco	09.10	(Gronemeyer 2006b: pl. 12)
^{2}tzu=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	TRT	Mon. 6	O2	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
u=TZUTZ=ja	*u-tzu<h>tz-[a]j-Ø-Ø*	1PASS	2.e.i	TZB	T. 4 Lnt. 3	D2a	Quintana Roo	09.06	(Alexandre Safronov n.p.)
TZUTZ=ja	*tzu<h>tz-[a]-Ø*	1PASS	2.e.i	YAX	Lnt. 2	C1	Usumacinta	09.16	(Graham and von Euw 1977: 15)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	YAX	St. 3	C1	Usumacinta	09.16	(Tate 1992: fig. 85)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	YAX	St. 6	C5b	Usumacinta	09.16	(Tate 1992: fig. 88)
TZUTZ=jo=ma	*tzu<h>tz-j-om-Ø*	1PASS	2.f.ii	YAX	Lnt. 31	K5	Usumacinta	09.16	(Graham 1979: 71)
TZUTZ=ja	*tzu<h>tz-[a]j-Ø*	1PASS	2.e.i	YAX	St. 33	pE2	Usumacinta	09.17	(Ian Graham n.p.)
TZUTZ=wi=ya	*tzutz-[u]w-Ø=iy*	2ANTIP	2.e.ii	TIK	St. 9	A1	Central Peten	09.02	(Jones and Satterthwaite 1982: fig. 13)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	BLK	St. 5	B5	Central Peten	08.18	(Grube 2008: fig. 8.6)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	PAL	TSB	H2	Tabasco	09.13	(Schele and Mathews 1979: no. 334)
u=^{2}tzu=wa	*u-tzutz-u-Ø*	2IND	1.a.ii	PNG	St. 3	G10	Usumacinta	09.14	(Stuart and Graham 2003: 27)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	PNG	St. 37	D2	Usumacinta	09.12	(Teufel 2004: 454)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	TIK	St. 3	A8	Central Peten	09.02	(Jones and Satterthwaite 1982: fig. 4)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	TIK	St. 31	C10	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	TIK	St. 31	D15	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	TIK	St. 31	E18	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	TIK	St. 39	Bp6	Central Peten	08.17	(Schele and Freidel 1990: fig. 4.14)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	UAX	St. 3	B9	Central Peten	09.03	(Graham 1986: 138)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	UAX	St. 22	B4a	Central Peten	09.03	(Graham 1986: 191)
u=TZUTZ=wa	*u-tzutz[-u]-Ø*	2IND	2.e.ii	UXL	St. 3	C5	Central Campeche	09.10	(Grube 2008: fig. 8.49)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	C Dr.	60b	A2	Yucatan	11.04	(Anders and Deckert 1975: 60)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CAY	Alt. 4	Q1	Usumacinta	09.15	(Mathews 1998: fig. 2)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CHN	Cenote PNG Jade	C1	Usumacinta	09.13	(Grube, Lacadena and Martin 2003: 8)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CHN	Cenote PNG Jade	H1	Usumacinta	09.13	(Grube, Lacadena and Martin 2003: 8)
TZUTZ=yi=ya	*tzutz-y-Ø=iy*	2MED	2.f.ii	CHN	St. 1	Q9	Yucatan	10.03	(Callaway 2011: fig. III.2)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CLK	St. 52	A14a	Central Campeche	09.15	(Ian Graham n.p.)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CLK	St. 52	E1a	Central Campeche	09.15	(Ian Graham n.p.)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CNC	St. 2	A3	Southern Peten	09.18	(Morley 1938)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	COB	St. 1	M19	Quintana Roo	09.12	(Graham and von Euw 1997: 22)
TZUTZ=yi=ya	*tzutz-y-Ø=iy*	2MED	2.f.ii	CPN	St. I	D3a	Motagua	09.12	(Schele 1987f: fig. 2)
TZUTZ=yi=ya	*tzutz-y-Ø=iy*	2MED	2.f.ii	CPN	St. J	W 19	Motagua	09.13	(Schele and Mathews 1998: fig. 4.5)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	CRN	HS. 3 II	C3a	Central Peten	09.13	(Martin and Stuart 2009: 25)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	DPL	HS. 2 W II	F1a	Pasion	09.12	(Fahsen 2002: fig. 8)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	DPL	HS. 4 I	H2	Pasion	09.12	(Houston 1993: fig. 4.11)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	DPL	St. 14	D2a	Pasion	09.14	(Houston 1993: fig. 3.24)

TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	DPL	P. 18	A2a	Pasion	09.14	(Houston 1993: fig. 4.4)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	FLD	St. 8	D8	Western Peten	09.16	(Guido Krempel n.p.)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	LGP	Alt. 1	G3	Western Peten	09.16	(Ian Graham n.p.)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	MQL	Str. 4 Frg. T	2	Southern Peten	10.00	(Graham 1967: fig. 39)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	MTL	St. 1	D6	Central Peten	09.14	(Tokovinine and Zender 2012: fig. 2.2)
u=TZUTZ=wi	*u-tzutz[-u]-Ø*	2IND	2.e.ii	NAR	Alt. 1	I10	Central Peten	09.08	(Graham 1978: 104)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	NAR	St. 23	G18	Central Peten	09.14	(Graham and von Euw 1975: 60)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	NKM	St. C	Ap4b	Central Peten	09.19	(Grube 2000c: fig. 196)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PAL	96G	A2	Tabasco	09.17	(Robertson 1991: fig. 265)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PAL	96G	H8	Tabasco	09.17	(Robertson 1991: fig. 265)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	PAL	96G	L3	Tabasco	09.17	(Robertson 1991: fig. 265)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PAL	TC	D4	Tabasco	09.12	(Robertson 1991: fig. 9)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PAL	TABL	L1b	Tabasco	09.11	(Schele and Mathews 1979: no. 36)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	Alt. 1	D'2	Usumacinta	09.13	(Teufel 2004: 535)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	Alt. 1	E2a	Usumacinta	09.13	(Teufel 2004: 535)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	Alt. 1	K2a	Usumacinta	09.13	(Teufel 2004: 535)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	Alt. 2	J3	Usumacinta	09.16	(Teufel 2004: 540)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 3	F4a	Usumacinta	09.14	(Stuart and Graham 2003: 26)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 3	F9	Usumacinta	09.14	(Stuart and Graham 2003: 26)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 8	M5	Usumacinta	09.14	(Stuart and Graham 2003: 44)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 9	pC15	Usumacinta	09.15	(Stuart and Graham 2003: 52)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PNG	St. 30	A13a	Usumacinta	09.05	(Teufel 2004: 428)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	PUS	St. D	B7	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
TZUTZ=ya	*tzutz-[u]y-Ø*	2MED	2.e.ii	QRG	St. C	B14a	Motagua	09.17	(Looper 2003: fig. 5.1)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	QRG	St. D	D17a	Motagua	09.17	(Looper 2003: fig. 4.28)
TZUTZ=ya	*tzutz-[u]y-Ø*	2MED	2.e.ii	QRG	Alt. P'	K2b	Motagua	09.18	(Jones 1983)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	QRG	Zoo. G	M'3a	Motagua	09.17	(Looper 2001: fig. 4)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 1	Bp5	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 1)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TCB	St. 1	Cp10b	Usumacinta	09.04	(Simon Martin n.p.)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 7	A7	Central Peten	09.03	(Jones and Satterthwaite 1982: fig. 11)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 8	A6	Central Peten	09.05	(Jones and Satterthwaite 1982: fig. 12)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 12	C3a	Central Peten	09.04	(Jones and Satterthwaite 1982: fig. 18b)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 16	A3	Central Peten	09.14	(Jones and Satterthwaite 1982: fig. 22)
TZUTZ=yi=ya	*tzutz-y-Ø=iy*	2MED	2.f.ii	TIK	St. 19	A12	Central Peten	09.17	(Jones and Satterthwaite 1982: fig. 27)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 31	C20a	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	St. 31	H26	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TIK	T. 4 Knt. 3	C7a	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 74)
TZUTZ=yi=ya	*tzutz-y-Ø=iy*	2MED	2.f.ii	TNA	Mon. 150	A2	Chiapas	09.07	(Graham and Henderson 2006: 84)
TZUTZ=yi	*tzutz-[u]y-i-Ø*	2MED	2.e.ii	TNA	Mon. 150	A4	Chiapas	09.07	(Graham and Henderson 2006: 84)
i TZUTZ=yi	*i['] tzutz-[u]y-i-Ø*	2MED	2.e.ii	UAX	St. 4	Bp3	Central Peten	08.18	(Graham 1986: 142)
u=TZUTZ=je=la	*u-tzutz-j-el*	3NMLS	1.f.iii	PAL	TI-W	I2	Tabasco	09.12	(Robertson 1983b: fig. 97)
u=TZUTZ=ji	*u-tzutz-[u]j-Ø*	4TEMP	2.e.ii	RAZ	Jd. Celt 2	A3	Central Peten	09.00	(Grube and Martin 2001: 49)
u=TZUTZ=ji	*u-tzutz-[u]j-Ø*	4TEMP	2.e.ii	YAX	HS. 2 VI	D2	Usumacinta	09.15	(Graham 1982: 159)

tz'a' – VER.TR.R: "to give"

tz'a=bi	*tz'a[']-b-i-Ø*	n/a	n/a	C Ma.	52c	A1-B1	Yucatan	11.11	(Anders 1967: 52)

tz'ak – POS: "put in order"

TZ'AK-ka=ja	*tz'a<h>k-aj-Ø*	1PASS	1.a.i	CNC	P. 1	L5	Southern Peten	09.13	(Yuriy Polyukhovych n.p.)
tz'a-ka=ja	*tz'a<h>k-aj-Ø*	1PASS	1.a.i	COL	Shl. Taylor Limpet	D1	?	09.18	(Guido Krempel n.p.)
tz'a-TZ'AK=ja	*tz'a<h>k-[a]j-Ø*	1PASS	2.e.i	MTL	K4996	P1	Central Peten	09.15	(Kerr 1994: 640)
TZ'AK-ka=ja	*tz'a<h>k-aj-Ø*	1PASS	1.a.i	NAR	K2796	O2	Central Peten	?	(Coe 1973: #49)
TZ'AK-ka=ja	*tz'a<h>k-aj-Ø*	1PASS	1.a.i	NAR	K7750	Y2	Central Peten	09.17	(Grube 1998b)
tz'a-ka=ba=ja	*tz'ak-b-aj-Ø*	1PASS	1.f.ii	RAZ	K2914	W1-X1	Central Peten	?	(Kerr 1990: 297)
u=TZ'AK-ka=wa	*u-tz'ak-a-Ø*	2IND	1.a.i	CLK	St. 9	pQ6	Central Campeche	09.10	(Ian Graham n.p.)
u=tz'a-ka=wa TE'	*u-tz'ak-a-Ø te'*	2IND	1.a.i	COL	St. New York	F1a	?	09.16	(Mayer 1995: pl. 153)
u=TZ'AK=wi	*u-tz'ak[-a]-Ø*	2IND	2.e.ii	NAR	Alt. 2	D6	Central Peten	09.17	Grube 2004: fig. 13
u=TZ'AK=wa	*u-tz'ak[-a]-Ø*	2IND	2.e.i	NAR	St. 23	F21	Central Peten	09.14	(Graham and von Euw 1975: 60)
u=TZ'AK=wa	*u-tz'ak[-a]-Ø*	2IND	2.e.i	PAL	TI-W	O3	Central Peten	09.12	(Robertson 1983b: fig. 97)
u=TZ'AK=wa	*u-tz'ak[-a]-Ø*	2IND	2.e.i	PAL	TC	S1	Tabasco	09.12	(Robertson 1991: fig. 9)
u=tz'a-ka=wa=a	*u-tz'ak-a-Ø-?*	2IND	4.a.i	PNG	St. 12	D2a	Usumacinta	09.18	(Stuart and Graham 2003: 62)
u=tz'a-ka=wa=?	*u-tz'ak-a-Ø-?*	2IND	4.a.i	QRG	Alt. O'	U2a	Motagua	09.18	(Jones 1983)
u=10=TZ'AK-ka=bu=ji	*u-10-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	CPN	St. 6	C1	Motagua	09.12	(McCready et al. 1988: fig. 2)
a=TZ'AK=bu=ji	*a-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	PAL	T18S	273b	Tabasco	09.14	(Schele and Mathews 1979: no. 539)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iiii	PAL	TISL	10	Tabasco	09.12	(Robertson 1983b: fig. 170)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	PAL	P. DOAKS 2	D5	Tabasco	09.14	(Coe and Benson 1966: fig. 8)
u=TZ'AK-ka=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	PMT	Mon. 11	Ap2	Tabasco	09.13	(Grube, Martin and Zender 2002: 10)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	QRG	Zoo. P	10-A2	Motagua	09.18	(Looper 2001: fig. 30)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	TIK	St. 31	A19	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	TIK	St. 31	D7	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	TIK	St. 31	C12	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	TIK	St. 31	E12	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52b)
u=TZ'AK=bu=ji	*u-tz'ak-b-uj-Ø*	4TEMP	1.f.iii	TRS	St. 1	E1	Pasion	08.19	(Lacadena 2011: fig.. 4a)
u=TZ'AK-ka=bu	*u-tz'ak-b-u[j]-Ø*	4TEMP	1.f.i	YAX	Lnt. 46	G7	Usumacinta	09.11	(Graham 1979: 101)

tz'am – NOUN: "throne"

?-TZ'AM=na=ja	*?-tz'am-n-aj-Ø*	1PASS	4.a.i	CRN	P. 3	E4	Central Peten	09.11	(Mayer 1987: pl. 37)

tz'ap – VER.TR.R: "to plant"

i tz'a-pa=ja	*i['] tz'a<h>p-aj-Ø*	1PASS	1.a.i	ARP	St. 2	C2	Pasion	09.15	(Houston and Mathews 1985: fig. 11)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	BJC	St. 2	A6	Central Peten	08.17	(Ian Graham n.p.)
i tz'a-pa=ja	*i['] tz'a<h>p-aj-Ø*	1PASS	1.a.i	BPK	ScS. 4	B4b	Usumacinta	09.09	(Arellano Hernández 1998: fig. 14)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	C Dr.	25c	A1	Yucatan	11.04	(Anders and Deckert 1975: 25)

tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	C Dr.	26c	A1	Yucatan	11.04	(Anders and Deckert 1975: 26)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	C Dr.	27c	A1	Yucatan	11.04	(Anders and Deckert 1975: 27)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	C Dr.	28c	A1	Yucatan	11.04	(Anders and Deckert 1975: 28)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	C Ma.	27b	D1	Yucatan	11.11	(Anders 1967: 27)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	C Ma.	60b	A1	Yucatan	11.11	(Anders 1967: 60)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	C Ma.	60b	C1	Yucatan	11.11	(Anders 1967: 60)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	C Ma.	60b	E1	Yucatan	11.11	(Anders 1967: 60)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CAY	Lnt. 1	N9	Usumacinta	09.17	(John Montgomery n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CHN	HPG-C4	E1	Yucatan	10.08	(Graña-Behrens 2002: pl. 25)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CKL	Mon. 22	pC2	Chiapas	09.06	(Navarrete 1984: fig. 69)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CKL	Mon. 9	A3	Chiapas	09.14	(Navarrete 1984: fig. 37)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CLK	St. 114	A12	Central Campeche	08.19	(Pincemin et al. 1998: fig. 7)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CLK	St. 43	B8	Central Campeche	09.04	(Ian Graham n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CLK	St. 89	A7	Central Campeche	09.15	(Mayer 1989: pl. 6)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COB	St. 1	F4	Quintana Roo	09.12	(Graham and von Euw 1997: 18)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	Cst. Hecelchakan	D1	Yucatan	09.08	(Graña-Behrens 2002: pl. 191)
i tz'a-pa=ja	*i[']* *tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	P. New Orleans	M1	Usumacinta	09.18	(Mayer 1995: pl. 99)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	St. Barbachano	Bp2	Yucatan	10.03	(Mayer 1989: pl. 97)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	St. Belmopan	B6	Hondo	08.19	(Eric von Euw n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	St. Brussels	A20	Usumacinta	09.08	(Mayer 1995: pl. 74)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	COL	St. New York	C2	?	09.16	(Mayer 1995: pl. 153)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	HS. 1 XXIX	A1b	Motagua	09.16	(Barbara Fash n.p.)
i tz'a-pa=ja	*i[']* *tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	Mon. 10	Gp2	Motagua	09.15	(Schele 1987e: fig. 2)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 1	C3	Motagua	09.11	(Linda Schele SD 1027)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 19	D3a	Motagua	09.10	(Linda Schele SD 1034)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 3	B13	Motagua	09.11	(Alexander 1988: fig. 2)
i tz'a-pa=ja	*i[']* *tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 4	A8-B8	Motagua	09.15	(Schele 1987f: fig. 5)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 5	B7	Motagua	09.09	(Schele 1987b: fig. 1)
i tz'a-pa=ja	*i[']* *tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. 6	D6	Motagua	09.12	(McCready et al. 1988: fig. 3)
tz'a-pa=ji=ya	*tz'a<h>p-j-Ø=iy*	1PASS	2.f.ii	CPN	St. A	B3a	Motagua	09.14	(Alexander 1988: fig. 1)
i tz'a-pa=pa=ja	*i[']* *tz'ap-p-aj-Ø*	1MED	1.f.ii	CPN	St. B	B1	Motagua	09.15	(Maudslay 1974, I: pl. 37)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. C	A10a	Motagua	09.14	(Maudslay 1974, I: pl. 41)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. D	B5a	Motagua	09.15	(Maudslay 1974, I: pl. 48)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. E	B10	Motagua	09.05	(Schele 1990b: fig. 5b)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. M	B4b	Motagua	09.16	(Maudslay 1974, I: pl. 74)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	St. N	A16	Motagua	09.16	(Maudslay 1974, I: pl. 79)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CPN	T. 22a Stone	A2	Motagua	09.18	(Schele et al. 1989: fig. 29)
tz'a-pa=ja=ya	*tz'a<h>p-j-Ø=[i]y*	1PASS	2.f.ii	CPN	T. 22a Stone	B5	Motagua	09.18	(Schele et al. 1989: fig. 29)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CRC	St. 1	C2	Mopan-Pusilha	09.08	(Beetz and Satterthwaite 1981: fig. 1)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	CRC	St. 23	D1	Mopan-Pusilha	09.05	(Grube 1994a: fig. 9.5)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	DBN	St. 1	Ap3	Central Campeche	09.14	(Graña-Behrens 2002: pl. 55)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	DPL	St. 1	pB1	Pasion	09.15	(Ian Graham n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	DPL	St. 15	C5	Pasion	09.14	(Houston 1993: fig. 3.25)

tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	EDZ	St. 21	A2	Yucatan	09.11	(Graña-Behrens 2002: pl. 65)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	EDZ	St. 22	A2	Yucatan	09.11	(Graña-Behrens 2002: pl. 66)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	HUA	St. 1	B2	Western Peten	09.16	(Colas 2003: fig. 2)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	JAI	St. 1	A7	Yucatan	09.11	(Graña-Behrens 2002: pl. 84)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	JAI	St. 5	B2	Yucatan	09.18	(Mayer 1995: pl. 112)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	JOY	St. 1	B1	Western Peten	09.02	(Arnauld 2002: fig. 5)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	KAB	Alt. 3	D1	Yucatan	10.01	(Graña-Behrens 2002: pl. 86)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	LAC	St. 7	F1	Usumacinta	09.09	(Alexandre Safronov n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	LMN	St. 9	B3	Hondo	09.09	(Reents-Budet 1988: fig. 1)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	MTL	K4996	T1	Central Peten	09.15	(Kerr 1994: 640)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	NAR	St. 18	H6	Central Peten	09.14	(Graham and von Euw 1975: 47)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	NMP	St. 15	D4b	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)
i tz'a-pa=ja	*i['] tz'a<h>p-aj-Ø*	1PASS	1.a.i	OAG	Alt. 1	Q1	Usumacinta	09.10	(Mayer 1995: pl. 91)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	OXK	St. 3	G4	Yucatan	10.01	(Graña-Behrens 2002: pl. 111)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	PRU	St. ?	B2	Central Peten	09.14	(Ian Graham n.p.)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	PRU	St. 12	B2	Central Peten	09.12	(Escobedo and Acuña 2003: fig. 1)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	PRU	St. 34	D4	Central Peten	09.13	(Miller 1974: 151)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	St. A	A10	Motagua	09.17	(Looper 2003: fig. 5.15)
TZ'AP?-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	St. C	G1	Motagua	09.17	(Looper 2003: fig. 5.19)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	St. D	B17a	Motagua	09.17	(Looper 2003: fig. 4.26)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	St. E	D9	Motagua	09.17	(Looper 2003: fig. 4.38)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	St. H	N1	Motagua	09.16	(Looper 2003: fig. 3.19)
tz'a-pa=ji=ya	*tz'a<h>p-j-Ø=iy*	1PASS	2.f.ii	QRG	St. I	C3a	Motagua	09.18	(Looper 2001: fig. 6)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	QRG	Zoo. P	J2	Motagua	09.18	(Looper 2001: fig. 23)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	RAZ	St. 1	B13	Central Peten	08.17	(Adams 1999: fig. 3.32)
i tz'a-pa	*i['] tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	SBL	St. 6	A9a	Pasion	09.17	(Graham 1996: 23)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	SRX	St. 4	C1	Central Campeche	10.04	(Graña-Behrens 2002: pl. 132)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	SRX	St. 5	B4	Central Campeche	09.10	(Graña-Behrens 2002: pl. 133)
i tz'a-pa=ja	*i['] tz'a<h>p-aj-Ø*	1PASS	1.a.i	TIK	Marcador	F7-E8	Central Peten	08.19	(Schele and Freidel 1990: fig. 4.12)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	TIK	St. 12	D2	Central Peten	09.04	(Jones and Satterthwaite 1982: fig. 17a)
tz'a-pu=ja	*tz'a<h>p-[a]j-Ø*	1PASS	2.b.i	TIK	St. 31	O1	Central Peten	09.00	(Jones and Satterthwaite 1982: fig. 52a)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	TIK	St. 40	A15	Central Peten	09.01	(Valdés and Fahsen 1998: fig. 9)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	TNA	Mon. 113	P1	Chiapas	09.12	(Graham and Mathews 1999: 147)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	TNA	Mon. 26	A7	Chiapas	09.12	(Mathews 1983: 63)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	TRT	Mon. 5	F1	Tabasco	09.12	(Gronemeyer 2006b: pl. 11)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	XCR	St. 1	C2	Yucatan	10.04	(Graña-Behrens 2002: pl. 179)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	XCR	St. 2	C2	Yucatan	10.01	(Graña-Behrens 2002: pl. 180)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	YAX	St. 11	C1	Usumacinta	09.16	(Tate 1992: fig. 136)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	YXH	St. 7	pB2	Central Peten	09.02	(Grube 2000c: fig. 200a)
tz'a-pa	*tz'a<h>p-a[j]-Ø*	1PASS	1.g.i	YXP	St. 3	Cp1	Yucatan	10.02	(Graña-Behrens 2002: pl. 185)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	ZAP	St. 1	B6	Central Peten	08.19	(Schele, Fahsen and Grube 1992: fig. 7)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	ZAP	St. 1	C12b	Central Peten	08.19	(Schele, Fahsen and Grube 1992: fig. 7)
tz'a-pa=ja	*tz'a<h>p-aj-Ø*	1PASS	1.a.i	ZAP	St. 5	D3	Central Peten	09.00	(Schele, Fahsen and Grube 1992: fig. 2)

tz'a-pa=wa cha-ki	*tz'ap-aw-Ø cha[h]k*	2ANTIP	1.a.i	C Pa.	3c	C1	Yucatan	10.18	(Anders 1968: 3)
tz'a-pa=wa TUN^ni^	*tz'ap-aw-Ø tun*	2ANTIP	1.a.i	UXM	St. 2	J3	Yucatan	10.03	(Graña-Behrens 2002: pl. 159)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	ALS	St. 8	B5	Pasion	09.09	(Alexander Voß n.p.)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	112c	A1	Yucatan	11.11	(Anders 1967: 112)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	112c	C1	Yucatan	11.11	(Anders 1967: 112)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	112c	E1	Yucatan	11.11	(Anders 1967: 112)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	28b	B1	Yucatan	11.11	(Anders 1967: 28)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	28b	D1	Yucatan	11.11	(Anders 1967: 28)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	C Ma.	28b	E1	Yucatan	11.11	(Anders 1967: 28)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	COB	St. 1	X21a	Quintana Roo	09.12	(Graham and von Euw 1997: 20)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	CRC	St. 11	C2	Mopan-Pusilha	09.18	(Chase and Chase 1987: fig. 71a)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	EDZ	St. 5	B1	Yucatan	09.18	(Graña-Behrens 2002: pl. 62)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	EKB	St. 1	E7	Yucatan	10.00	(Lacadena 2002: 10)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	ITZ	St. 4	A3	Yucatan	09.16	(von Euw 1977: 13)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	IXL	Alt. 1	B6	Central Peten	10.01	(Jones and Satterthwaite 1982: fig. 81c)
u=tz'a-pa=wa TUN^ni^	*u-tz'ap-a-Ø tun*	2IND	1.a.i	IXZ	St. 4	A2	Mopan-Pusilha	09.17	(Graham 1980: 181)
u=tz'a=wa	*u-tz'a[p-a]-Ø*	2IND	2.g.ii	KAB	Str. 1A1 Panel	C2	Yucatan	10.01	(Graña-Behrens 2002: pl.90)
u=tz'a-pa=wa TUN^ni^	*u-tz'ap-a-Ø tun*	2IND	1.a.i	MQL	St. 4	A4	Southern Peten	09.15	(Graham 1967: fig. 63)
u=tz'a-pa=wi	*u-tz'ap-a-Ø*	2IND	1.a.ii	NAR	St. 36	C1	Central Peten	09.13	(Graham 1978: 93)
u=tz'a-pa u=TUN^ni^	*u-tz'ap-a-Ø u-tun*	2IND	1.g.i	NMP	St. 15	Y3	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	NMP	St. 15	Y6b	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 20)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	NMP	St. 2	D4	Mopan-Pusilha	09.15	(Grube, MacLeod and Wanyerka 1999: 26)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	OXK	St. 21	Bp4	Yucatan	10.01	(Graña-Behrens 2002: pl. 116)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PRU	St. 33	B5	Central Peten	09.13	(Miller 1974: 157)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PRU	St. 34	G3b	Central Peten	09.13	(Miller 1974: 151)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PUS	St. D	A10	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PUS	St. D	H10	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 4)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PUS	St. P	A10	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 17)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	PUS	St. P	F6	Mopan-Pusilha	09.10	(Prager 2002a, III: fig. 17)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	Alt. P'	U2b	Motagua	09.18	(Jones 1983)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	St. C	A10a	Motagua	09.17	(Looper 2003: fig. 5.1)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	St. C	B7	Motagua	09.17	(Looper 2003: fig. 5.1)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	St. C	C7	Motagua	09.17	(Looper 2003: fig. 5.14)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	St. F	C11b	Motagua	09.16	(Looper 2003: fig. 4.5)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	St. J	A17	Motagua	09.16	(Looper 2003: fig. 3.29)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	Zoo. P	12-B2a	Motagua	09.18	(Looper 2001: fig. 30)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	Zoo. P	1-A2	Motagua	09.18	(Looper 2001: fig. 29)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	QRG	Zoo. P	6-A2	Motagua	09.18	(Looper 2001: fig. 29)
u=tz'a-pa=wa	*u-tz'ap-a-Ø*	2IND	1.a.i	SRX	St. 3	E1	Central Campeche	10.02	(Graña-Behrens 2002: pl. 131)
u=tz'a-pa	*u-tz'ap-a-Ø*	2IND	1.g.i	TZM	St. 2	pC3	Yucatan	09.18	(von Euw 1977: 54)
tz'a-po=lo	*tz'ap-ol-Ø*	3NMLS	1.b.i	SRX	St. 2	D1	Central Campeche	09.18	(Graña-Behrens 2002: pl. 130)

tz'ay – VER.TR.R: "to burn"

tz'a-ya=ja	*tz'a<h>y-aj-Ø*	1PASS	1.c.i	NTN	Dwg. 88	D2	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
tz'a-ya=ja=la	*tz'a<h>y-j-al*	1PASS	2.f.ii	PAL	T18S	176b	Tabasco	09.14	(Schele and Mathews 1979: no. 537)

tz'i[h]b – NOUN: "writing"

tz'i-ba=ja	*tz'i[h]b-aj-Ø*	1INCH	1.d.i	NTN	Dwg. 13	C1	Mopan-Pusilha	?	(Stone 1994: fig. 8.13)
tz'i-ba=ja	*tz'i[h]b-aj-Ø*	1INCH	1.d.i	COL	K8342	D1	?	?	(Justin Kerr n.p.)
tz'i-ba=ja=la	*[u-]tz'i[h]b-aj-al*	1INCH	2.f.ii	AGT	IDAEH Cer. 56-6	pA1-pB1	Pasion	?	(Sven Gronemeyer DSC03883)
tz'i-ba=ja=la	*tz'i[h]b-j-al*	1INCH	2.f.ii	AGT	Msc. 805284	pB1-pC1	Pasion	09.09	(Eberl 2007: fig. 3.10)

tz'i[h]b-a – VER.TR.D: "to write"

u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	BVC	K2730	C1-D1	Mopan-Pusilha	?	(Kerr 1990: 276)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	God D Vessel	C1	?	?	(Boot 2008: fig. 1b)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	Guatemala	A2-B2	Central Peten	?	(Boot 2005c: 9)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K504	C1-D1	?	?	(Coe 1978: #7)
u=tz'i-ku=na=li	*u-tz'i[h][b]-n-a[j]-[a]l-Ø*	1PASS	1.f.i	COL	K530	E1-H1	?	?	(Coe 1978: #11)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K532	C1-E1	?	?	(Kerr 1989: 18)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K554	F1-G1	?	?	(Schele and Miller 1986: pl. 48a)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K555	E1-F1	?	?	(Coe 1978: #8)
u=tz'i=na=ja=la	*u-tz'i[h][b]-n-aj-al-Ø*	1PASS	1.f.ii	COL	K559	B1-C1	?	?	(Kerr 1989: 20)
na=ja=la	*[u-tz'ihb]-n-aj-al-Ø*	1PASS	4.a.i	COL	K595	B1	?	?	(Coe 1978: #12)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K625	A2-B2	?	?	(Kerr 1989: 27)
tz'i-bi-ba=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K758	B1-D1	?	?	(Coe 1982: #15)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	4.a.i	COL	K764	C1	?	?	(Kerr 1989: 45)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K771	B1-C1	?	?	(Robicsek and Hales 1982: #138)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K796	A1-B1	?	?	(Kerr 1989: 52)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	4.a.i	COL	K1080	A3	?	?	(Robicsek and Hales 1982: #53)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]-Ø*	1PASS	1.f.ii	COL	K1200	A2-A3	?	?	(Robicsek and Hales 1982: #18)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1211	C1-D1	?	?	(Coe 1982: #58)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1227	B1-C1	?	?	(Robicsek and Hales 1982: #144)
u=tz'i-ba=na	*u-tz'i[h]b-n-a[j-al]-Ø*	1PASS	1.f.i	COL	K1256	D1-F1	Pasion	?	(Robicsek and Hales 1982: #54)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1303	A1-B1	?	?	(Justin Kerr n.p.)
tz'i-bi	*tz'i[h]b[-n-aj]-Ø*	1PASS	4.a.ii	COL	K1335	B1	?	?	(Robicsek and Hales 1982: tab. 1.I)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1348	B1-C1	?	?	(Robicsek and Hales 1982: #135)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1350	B1-C1	?	?	(Robicsek and Hales 1982: tab. 15.B)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1355	B1-C1	?	?	(Kerr 1989: 73)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1377	D1-E1	?	?	(Robicsek and Hales 1982: fig. 31b)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1390	B1-C1	?	?	(Kerr 1989: 77)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1394	B1-C1	?	?	(Robicsek and Hales 1982: fig. 86c)
tz'i=na=ja	*tzi'[hb]-n-aj-Ø*	1PASS	1.f.ii	COL	K1437	B1-C1	?	?	(Robicsek and Hales 1982: #171)

u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K1485	D1-F1	?	?	(Kerr 1989: 90)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1522	E1-F1	?	?	(Robicsek and Hales 1982: #66)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1523	B1-C1	Central Peten	?	(Robicsek and Hales 1982: #71)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1552	B1-C1	Central Peten	?	(Robicsek and Hales 1982: tab. 7.B)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1647	B1-C1	Central Peten	?	(Robicsek and Hales 1982: #165)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K1775	D1-E1	?	?	(Kerr 1989: 109)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1810	B1-C1	Central Peten	?	(Robicsek and Hales 1982: tab. 15.A)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1873	M1-O1	?	?	(Kerr 1989: 120)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1899	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K1941	D1-E1	Central Peten	?	(Kerr 1990: 194)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2068	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2152	B1-C1	Central Peten	?	(Kerr 1990: 218)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2226	B1-C1	?	?	(Kerr 1990: 226)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2285	A2-B1	?	?	(Kerr 1990: 227)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K2295	C1-D1	Central Peten	?	(Kerr 1990: 233)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	1.f.ii	COL	K2323	B1	Central Peten	?	(Kerr 1990: 234)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K2358	C1-D1	Central Peten	?	(Kerr 1990: 242)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2583	B1-C1	Central Peten	?	(Kerr 1990: 246)
tz'i-ba=NAH=la	*tz'i[h]b-n-a[j]-[a]l-Ø*	1PASS	1.e.iv	COL	K2695	Q1	?	?	(Kerr 1990: 255)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2695	C1-D1	?	?	(Kerr 1990: 255)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2716	B1-C1	?	?	(Kerr 1990: 273)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2716	B1-C1	Central Peten	?	(Kerr 1990: 275)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2773	B1-C1	Central Peten	?	(Kerr 1990: 286)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K2777	C1-D1	Central Peten	?	(Schele and Miller 1986: pl. 73a)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K2801	A3-A4	?	?	(Kerr 1990: 296)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2873	B1-C1	?	?	(Schele and Miller 1986: pl. 47a)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K2928	B1-C1	?	?	(Kerr 1990: 299)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K3025	A3-A4	Central Peten	?	(Kerr 1992: 379)
u=tz'i-bi=na	*u-tz'i[h]b-n-a[j-al]-Ø*	1PASS	1.f.i	COL	K3033	D1-E1	Central Peten	?	(Reents-Budet 1994: 274)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3046	C1-E1	?	?	(Barbara van Heusen n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3059	C1-D1	?	?	(Jim Crocker n.p.)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	4.a.i	COL	K3061	B1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K3066	C1-D1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3229	B1-C1	Central Peten	?	(Kerr 1992: 393)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3366	B1-C1	Central Peten	?	(Kerr 1992: 408)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	4.a.i	COL	K3412	B1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3433	B1-C1	?	?	(Kerr 1992: 417)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3472	B1-C1	Central Peten	?	(Kerr 1992: 422)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3478	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3684	B1-C1	?	?	(Kerr 1992: 427)
na=ja=la	*[u-tz'ihb]-n-aj-al-Ø*	1PASS	4.a.i	COL	K3699	B1	?	?	(Kerr 1992: 429)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K3699	D1-E1	?	?	(Kerr 1992: 429)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K3795	D1-E1	?	?	(Justin Kerr n.p.)

u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K4021	D1-E1	?	?	(Kerr 1992: 455)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K4379	C1-D1	?	?	(Kerr 1992: 484)
yu=tz'i-bi=na=ja	*(y)u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K4386	C1-D1	?	?	(Kerr 1992: 486)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K4644	B1-C1	Central Peten	?	(Kerr 1994: 572)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K4669	A2-B2	Central Peten	09.15	(Kerr 1994: 582)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K4689	C1-F1	?	?	(Kerr 1994: 592)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K4945	C1-D1	?	?	(Kerr 1994: 621)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K4946	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K4990	B1-C1	Central Peten	?	(Kerr 1994: 637)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5016	D1-E1	?	?	(Justin Kerr n.p.)
na=ja	*[tz'ihb]-n-aj-Ø*	1PASS	4.a.i	COL	K5043	B1	?	?	(Kerr and Kerr 1997: 747)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5057	B1-C1	Central Peten	?	(Kerr and Kerr 2000: 914)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5058	B1-C1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5062	E1-F1	?	?	(Kerr and Kerr 2000: 916)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5064	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5072	B1-C1	?	?	(Reents-Budet 1994: 73)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5073	B1-C1	?	?	(Reents-Budet 1994: 86)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5196	B1-C1	?	?	(Kerr and Kerr 1997: 771)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5198	C1-D1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5229	C1-E1	Central Peten	?	(Kerr and Kerr 1997: 777)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K5241	C1-D1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5347	B1-C1	?	?	(Reents-Budet 1994: 138)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K5356	C1-D1	Central Peten	?	(Reents-Budet 1994: 185)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5360	B1-C1	Central Peten	?	(Kerr and Kerr 1997: 785)
tz'i-bi-ji=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5364	B1-C1	?	?	(Kerr and Kerr 1997: 786)
u=tz'i-bi=na	*u-tz'i[h]b-n-a[j-al]*	1PASS	1.f.i	COL	K5366	L3-L4	Central Peten	?	(Kerr and Kerr 1997: 788)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5366	C1-D1	Central Peten	?	(Kerr and Kerr 1997: 788)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5366	M3-M4	Central Peten	?	(Kerr and Kerr 1997: 788)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5391	B1-C1	Central Peten	?	(Kerr and Kerr 2000: 931)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5424	B1-C1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5454	D1-F1	?	?	(Kerr and Kerr 1997: 805)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5567	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5568	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5617	B1-C1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K5629	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5644	B1-C1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5720	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5721	B1-C1	Central Peten	?	(Kerr and Kerr 2000: 935)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5722	C1-D1	Central Peten	?	(Kerr and Kerr 1997: 819)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5763	A3-A4	?	?	(Kerr and Kerr 2000: 937)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K5838	D1-F1	?	?	Reents-Budet 1994, 36
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K5847	D1-F1	?	?	(Kerr and Kerr 2000: 943)
na=ja=la	*[u-tz'ihb]-n-aj-al-Ø*	1PASS	4.a.i	COL	K5857	D1	?	?	(Kerr and Kerr 1997: 821)

tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5930	B1-C1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K5979	B1-C1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K6059	C1-D1	?	?	(Kerr and Kerr 1997: 825)
u=tz'i-ba=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K6294	A3-A4	?	?	(Kerr and Kerr 2000: 957)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K6315	E1-F1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K6394.1	D1-E1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K6394.2	B1-C1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K6418	F1-G1	Central Peten	?	(Kerr and Kerr 2000: 963)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K6426	B1-C1	Central Peten	?	(Kerr and Kerr 2000: 965)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K6426A	B1-C1	Central Peten	?	(Kerr and Kerr 2000: 965)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K6437	N2-N3	?	?	(Kerr and Kerr 2000: 967)
u=tz'i-bi=na	*u-tz'i[h]b-n-a[j-al]*	1PASS	1.f.i	COL	K6611	C1-E1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K6617	B1-C1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K6659	D1-E1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K6755	C1-D1	Central Peten	?	(Kerr and Kerr 2000: 978)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K7055	C1-D1	Central Peten	?	(Krempel and Matteo 2012: fig. 5d)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K7190	C1-E1	?	?	(Kerr and Kerr 2000: 990)
u=tz'i-bi=na=ja=ma	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K7265	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K7432	B1-C1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K7459	C1-D1	Central Peten	?	(Krempel and Matteo 2012: fig. 10d)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K7460	D1-E1	?	?	(Kerr and Kerr 2000: 998)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K7524	C1-E1	Central Peten	?	(Kerr and Kerr 2000: 999)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K7786	C1-D1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K7795	B1-C1	?	?	(Kerr and Kerr 2000: 1008)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	COL	K7797	C1-E1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K7821	D1-E1	?	?	(Kerr and Kerr 2000: 1010)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8076	E1-F1	?	?	(Kerr and Kerr 2000: 1016)
u=tz'i-ba=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K8123	A3-A4	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8266	B1-C1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=li	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K8417	D1-F1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8425	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8457	C1-D1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8497	A3-A4	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8504	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8651	B1-C1	Central Peten	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8660	B1-C1	?	?	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8719	D1-E1	?	?	(Justin Kerr n.p.)
tz'i-ba=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	K8722	E1-F1	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	K8732	A2-A3	?	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	MFA 1988.1284	C1-D1	Central Peten	?	(Boot 2009a: fig. 1)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	COL	Mus. Sta. Barbara	B1-C1	?	?	(Sven Gronemeyer 25-000001)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	COL	Mus. Sta. Barbara	B1	?	?	(Sven Gronemeyer 23-000016)
u=tz'i-ba=na=ja=la	*u-tz'i[h]b-n-aj-al-Ø*	1PASS	1.f.ii	CRC	Str. 4L6 Vessel	C1-D1	Mopan-Pusilha	09.15	(Chase and Chase 1987: fig. 38)

u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	MS	K1838	C1-D1	?	?	(Sebastian Matteo n.p.)
u=tz'i-ba=na=ja=la	*u-tz'i[h]b-n-aj-al-Ø*	1PASS	1.f.ii	MTL	K1004	B1	Central Peten	09.15	(Robicsek and Hales 1982: #186)
u=tz'i-bi=na=ha=la	*u-tz'i[h]b-n-ah-al*	1PASS	1.f.ii	MTL	K1728	E1-G1	Central Peten	09.16	(Kerr 1989: 105)
u=tz'i-bi=na=ha=la	*u-tz'i[h]b-n-ah-al-Ø*	1PASS	1.f.ii	MTL	K3120	G1-H1	Central Peten	09.16	(Velásquez García 2009a: fig. 9a)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	MTL	K5850	C1-D1	Central Peten	?	(Kerr and Kerr 2000: 944)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	MTL	K8176	C1-D1	Central Peten	?	(Kerr and Kerr 2000: 1018)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	MTL	K8286	C1-D1	Central Peten	09.15	(Justin Kerr n.p.)
tz'i-bi=na=ja	*tz'i[h]b-n-aj-Ø*	1PASS	1.f.ii	NAR	K5764	B1-E1	Central Peten	09.05	(Kerr and Kerr 1997: 820)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	RAZ	Babylas	C1-D1	Central Peten	?	(Sebastian Matteo n.p.)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	RAZ	K1383	A3-A4	Central Peten	?	(Kerr 1989: 78)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	RAZ	K2914	C1-D1	Central Peten	?	(Kerr 1990: 297)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	RAZ	K7720	A3-A4	Central Peten	?	(Kerr and Kerr 2000: 1004)
na=ja=la	*[u-tz'ihb]-n-aj-al-Ø*	1PASS	4.a.i	TIK	K3395	B1-C1	Central Peten	09.12	(Reents-Budet 1994: 272)
u=na=ja=la	*u-[tz'ihb]-n-aj-al*	1PASS	1.f.ii	TIK	K5453	B1	Central Peten	09.12	(Kerr and Kerr 1997: 804)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K1547	C1-D1	Central Peten	?	(Robicsek and Hales 1982: #184)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K1837	C1-D1	Central Peten	?	(Kerr 1989: 116)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	K3743	C1-D1	Central Peten	09.16	(Kerr 1992: 432)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K4387	C1-D1	Central Peten	09.16	(Kerr 1992: 487)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K4388	C1-D1	Central Peten	09.16	(Kerr 1992: 488)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	K4572	C1-D1	Central Peten	09.16	(Kerr 1994: 555)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	K4572	C1-D1	Central Peten	09.16	(Kerr 1994: 555)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	K4909	C1-D1	Central Peten	09.16	(Kerr 1994: 610)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K8007	C1-D1	Central Peten	09.16	(Kerr and Kerr 2000: 1012)
u=tz'i-bi=na=ja	*u-tz'i[h]b-n-aj-a[l]*	1PASS	1.f.ii	XUL	K8015	C1-D1	Central Peten	?	(Justin Kerr n.p.)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	K8728	C1-D1	Central Peten	09.16	(Krempel and Matteo 2012: fig. 4)
u=tz'i-bi=na=ja=la	*u-tz'i[h]b-n-aj-al*	1PASS	1.f.ii	XUL	MS1839	C1-D1	Central Peten	09.17	(Krempel and Matteo 2012: fig. 3f)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	CMA	K578	B1	Southern Peten	?	(Coe 1978: #10)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	COL	God D Vessel	J1	?	?	(Boot 2008: fig. 1d)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	COL	K1485	M1	?	?	(Kerr 1989: 90)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	COL	K1873	W1	?	?	(Kerr 1989: 120)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	COL	K4930	C1-D1	?	?	(Kerr 1994: 617)
u=bi-ba	*u-[tz'ih]b-a-Ø*	2IND	1.e.iii	COL	K595	D1-F1	?	?	(Coe 1978: #12)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	COL	K731	D1-F1	?	?	(Reents-Budet 1994: 208)
ti tz'i-ba	*ti tz'i[h]b-a-Ø*	2IND	1.g.i	COL	K7459	L3	Central Peten	?	(Krempel and Matteo 2012: fig. 10d)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	JOL	Dwg. 4-6	A1	Tabasco	?	(Riese 1981: 55)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	MTL	K3054	L1	Central Peten	09.16	(Jim Clarkson n.p.)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	MTL	K791	V1	Central Peten	09.16	(Kerr 1989: 49)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	NTN	Dwg. 66	J1	Mopan-Pusilha	09.16	(MacLeod and Stone 1994: fig. 7.12)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	NTN	Dwg. 88	B9	Mopan-Pusilha	09.12	(MacLeod and Stone 1994: fig. 7.3)
u=tz'i-ba	*u-tz'i[h]b-a-Ø*	2IND	1.g.i	TZM	Msc. 8	1	Yucatan	?	(von Euw 1977: 66)

tz'ik – VER.TR.R

u=tz'i-ko=lo	*u-tz'ik-ol*	3NMLS	1.b.i	CPN	T. 11 RS	Ad	Motagua	09.17	(Schele 1987d: fig. 1)
u=tz'i-ko=lo	*u-tz'ik-ol*	3NMLS	1.b.i	CPN	T. 11 SDEP	B1	Motagua	09.17	(Schele, Stuart and Grube 1989: fig. 6)

tz'un – VER.TR.R: "to start, to begin"

tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	6b	E1	Yucatan	11.04	(Anders and Deckert 1975: 6)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	7b	A1	Yucatan	11.04	(Anders and Deckert 1975: 7)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	7b	C1	Yucatan	11.04	(Anders and Deckert 1975: 7)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Dr.	7b	E1	Yucatan	11.04	(Anders and Deckert 1975: 7)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Ma.	20d	D1	Yucatan	11.11	(Anders 1967: 20)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Ma.	20d	E1	Yucatan	11.11	(Anders 1967: 20)
tz'u-nu	*tz'un-u[w]-Ø*	2ANTIP	1.g.i	C Ma.	21d	B1	Yucatan	11.11	(Anders 1967: 21)

ub-i – VER.TR.D: "to hear"

u-bu=ji=ya	*ub-j-Ø=iy*	1PASS	2.f.ii	PAL	TIJE-R	4	Tabasco	09.12	(Houston, Taube and Stuart 2006: fig. 4.18)

uh – NOUN: "bead, jewel"

u-ha=ja	*uh-aj*	1ABSL	1.c.i	PAL	TI-E	S5	Tabasco	09.12	(Robertson 1983b: fig. 95)
u-ha=ja	*uh-aj*	1ABSL	1.c.i	PAL	TI-M	B8	Tabasco	09.12	(Robertson 1983b: fig. 96)

uh – VER.TR.R: "to sanctify, to make sacred"

UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	El Señor	A2	Central Peten	?	(Sebastian Matteo n.p.)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	Guatemala	B1	Central Peten	?	(Boot 2005c: 9)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	MTL	K791	D1	Central Peten	09.16	(Kerr 1989: 49)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	COL	K954	A3	?	?	(Kerr and Kerr 1997: 731)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	COL	K1609	L1	?	?	(Schele and Miller 1986: pl. 122)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	COL	K1873	B1	?	?	(Kerr 1989: 120)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K2801	A2	?	?	(Kerr 1990: 296)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K4354	B1	Central Peten	?	(Kerr 1992: 475)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K4386	B1	?	?	(Kerr 1992: 486)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	COL	K4997	B1	Central Peten	?	(Kerr 1994: 639)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K5198	B1	Central Peten	?	(Justin Kerr n.p.)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K5366	B1	Central Peten	?	(Kerr and Kerr 1997: 788)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K5366	L2	Central Peten	?	(Kerr and Kerr 1997: 788)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K5366	M2	Central Peten	?	(Kerr and Kerr 1997: 788)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	COL	K6294	A2	?	?	(Kerr and Kerr 2000: 957)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K6437	N1	?	?	(Kerr and Kerr 2000: 967)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	COL	K6809	B1	?	?	(Justin Kerr n.p.)

UH=ya	*uh-[u]y-Ø*	2MED	2.e.ii	MTL	K1728	D1	Central Peten	09.16	(Kerr 1989: 105)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	MTL	K5850	B1	Central Peten	?	(Kerr and Kerr 2000: 944)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	RAZ	Babylas	A1	Central Peten	?	(Sebastian Matteo n.p.)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	RAZ	K2914	B1	Central Peten	?	(Kerr 1990: 297)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	RAZ	K5022	A1	Central Peten	?	(Kerr and Kerr 1997: 736)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	TIK	MT 98	B1	Central Peten	09.12	(Culbert 1993: Fig. 48a)
UH	*uh[-uy-i]-Ø*	2MED	2.g.ii	TIK	MT 98	G1	Central Peten	09.12	(Culbert 1993: Fig. 48a)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	XUL	K4387	B1	Central Peten	09.16	(Kerr 1992: 487)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	XUL	K4572	B1	Central Peten	09.16	(Kerr 1994: 555)
UH=yi	*uh-[u]y-i-Ø*	2MED	2.e.ii	XUL	MS1839	B1	Central Peten	09.17	(Krempel and Matteo 2012: fig. 3f)

uk' – VER.TR.R: "to drink"

u-k'u=wi	*uk'-uw-Ø*	2ANTIP	1.a.ii	CHN	CC-HB	7	Yucatan	10.02	(Voß and Kremer 2000: fig. 5)
u-k'u=wi	*uk'-uw-Ø*	2ANTIP	1.a.ii	DBC	St. 19	A2	Yucatan	10.00	(Grube, Lacadena and Martin 2003: 34)
u-k'u=wi	*uk'-uw-Ø*	2ANTIP	1.a.ii	DBC	Str. 42 Femur	A3	Yucatan	10.00	(Grube, Lacadena and Martin 2003: 33)
u-k'u=wi	*uk'-uw-Ø*	2ANTIP	1.a.ii	DZL	St. 1	Gp3	Yucatan	10.00	(Graña-Behrens 2002: fig. 114)
xa=yu=UK'=wa	*x-y-uk'-[u]-Ø*	2IND	2.e.ii	TIK	MT. 9	F1	Central Peten	09.01	(Moholy-Nagy 2008: fig. 139a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	AGT	Msc. 805284	pD1	Central Peten	09.09	(Eberl 2007: fig. 3.10)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	AGT	IDAEH Cer. 56-6	pC1	Pasion	?	(Sven Gronemeyer DSC03883)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	ALH	K2993	E1	Hondo	?	(Kerr 1992: 376)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	ALH	K2993	M1	Hondo	?	(Kerr 1992: 376)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	ALS	IDAEH Cer. 51-5	pA1	Pasion	?	(Sven Gronemeyer DSC03795)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	ALS	IDAEH Cer. 54-6	pA1	Pasion	?	(Sven Gronemeyer DSC03860)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	ALS	K3120	I1	Central Peten	09.16	(Velásquez García 2009b: fig. 9a)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	BPT	Bur. 2 Msc. 2	C1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	BPT	Ca. 1 Msc. 5	E1	Mopan-Pusilha	09.01	(Colas et al. 2002: fig. 5b)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	BPT	Msc. Min. Vase	C1	Mopan-Pusilha	09.17	(Grube and Martin 2004: 67)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	BVC	K2730	E1	Mopan-Pusilha	?	(Kerr 1990: 276)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	CLK	Schaffhausen	A5	Central Campeche	09.12	(Prager 2004: fig. 12)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	CMA	K578	C1	Southern Peten	?	(Coe 1978: #10)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	Berlin Ca 44342	C1	?	?	(Grube and Gaida 2006: #2)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Berlin Ca 44347	G1	Yucatan	?	(Grube and Gaida 2006: #27)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Berlin Ca 49928	A1	?	?	(Grube and Gaida 2006: #11)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	Berlin Ca 50113	E1	Central Peten	?	(Grube and Gaida 2006: #33)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Duke University	A1	?	?	(Boot 2005b: fig. 9)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	El Señor	A4	Central Peten	?	(Sebastian Matteo n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	God D Vessel	D1	?	?	(Boot 2008: fig. 1a)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K504	E1	?	?	(Coe 1978: #7)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K504	M1	?	?	(Coe 1978: #7)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K508	B3	Yucatan	09.17	(Kerr 1989: 16)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K511	B3	Central Peten	?	(Reents-Budet 1994: 39)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K530	L1	?	?	(Coe 1978: #11)

yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K531	A1	Central Campeche	?	(Robicsek and Hales 1982: #33)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K532	F1	?	?	(Kerr 1989: 18)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K554	H1	?	?	(Schele and Miller 1986: pl. 48a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K555	H1	?	?	(Coe 1978: #8)
ti yu=k'i=bi	*ti y-uk'-ib*	3INSTR	1.b.i	COL	K595	H1	?	?	(Coe 1978: #12)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K623	D1	?	?	(Kerr 1989: 25)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K625	A3	?	?	(Kerr 1989: 27)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K671	G1	?	?	(Kerr 1989: 32)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	COL	K703	J1	Central Peten	?	(Kerr 1989: 38)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K731	G1	?	?	(Reents-Budet 1994: 208)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K758	E1-F1	?	?	(Coe 1982: #15)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K764	F1	?	?	(Kerr 1989: 45)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K771	E1	?	?	(Robicsek and Hales 1982: #138)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K774	I1	?	?	(Kerr 1989: 47)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K796	H1	?	?	(Kerr 1989: 52)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K955	I1	Central Peten	?	(Robicsek and Hales 1982: #126)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1092	G1	?	?	(Kerr 1989: 58)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K1116	D1	?	?	(Kerr 1989: 59)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1181	A1	?	?	(Robicsek and Hales 1982: #47)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1182	A1	?	?	(Robicsek and Hales 1982: #15)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	COL	K1183	D1-E1	?	?	(Reents-Budet 1994: 279)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1186	F1	?	?	(Kerr 1989: 66)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1197	A1	?	?	(Robicsek and Hales 1982: #30)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1203	A1	?	?	(Robicsek and Hales 1982: #48)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1211	E1	?	?	(Coe 1982: #58)
yu=UK'=bi	*y-uk'-ib-Ø*	3INSTR	3.a.i	COL	K1226	A1	?	?	(Kerr 1989: 68)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1227	E1	?	?	(Robicsek and Hales 1982: #144)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1230	A1	?	?	(Robicsek and Hales 1982: #40)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K1231	A1	?	?	(Robicsek and Hales 1982: #44)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1248	B1	?	?	(Robicsek and Hales 1982: #101)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1256	G1	Pasion	?	(Robicsek and Hales 1982: #54)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1285	A1	Central Peten	?	(Coe 1982: #33)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1303	D1	?	?	(Justin Kerr n.p.)
u-UK'	*uk'[-ib]-Ø*	3INSTR	2.g.ii	COL	K1339	A1	?	?	(Robicsek and Hales 1982: #140)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1341	A1	?	?	(Robicsek and Hales 1982: #38)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K1344	I1	Central Peten	?	(Robicsek and Hales 1982: #125)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1348	G1	?	?	(Robicsek and Hales 1982: #135)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1350	E1	?	?	(Robicsek and Hales 1982: tab. 15.B)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1371	M1	Central Peten	?	(Robicsek and Hales 1982: #128)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1377	F1	?	?	(Robicsek and Hales 1982: fig. 31b)
yu=k'i=?=bi	*y-uk'-C-ib-Ø*	3INSTR	1.f.ii	COL	K1379	J1-L1	?	?	(Kerr 1989: 76)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1390	E1	?	?	(Kerr 1989: 77)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1394	E1	?	?	(Robicsek and Hales 1982: fig. 86c)

yu=k'i=ba	*y-uk'-ib*	3INSTR	1.b.ii	COL	K1437	E1	?	?	(Robicsek and Hales 1982: #171)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1485	G1	?	?	(Kerr 1989: 90)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1522	G1	?	?	(Robicsek and Hales 1982: #66)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1523	E1	Central Peten	?	(Robicsek and Hales 1982: #71)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1552	E1	Central Peten	?	(Robicsek and Hales 1982: tab. 7.B)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1560	C1	?	?	(Kerr 1989: 98)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1647	E1	Central Peten	?	(Robicsek and Hales 1982: #165)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K1650	A1	Central Peten	?	(Robicsek and Hales 1982: #3)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1652	A1	?	?	(Robicsek and Hales 1982: #39)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K1670	A1	Central Peten	?	(Kerr 1989: 103)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1775	F1	?	?	(Kerr 1989: 109)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1792	I1	?	?	(Kerr 1989: 113)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K1810	E1	Central Peten	?	(Robicsek and Hales 1982: tab. 15.A)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1873	F1	?	?	(Kerr 1989: 120)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1873	P1	?	?	(Kerr 1989: 120)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1899	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1901	H1-J1	?	?	(Kerr 1989: 126)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K1941	F1	Central Peten	?	(Kerr 1990: 194)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2026	F1	?	?	(Kerr 1990: 205)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2068	F1	Central Peten	?	(Kerr 1990: 211)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2152	E1	Central Peten	?	(Kerr 1990: 218)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2206	E1	Southern Peten	?	(Kerr 1990: 219)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2220	F1	?	?	(Kerr 1990: 225)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2226	E1	?	?	(Kerr 1990: 226)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2292	G1	?	?	(Kerr 1990: 230)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2292	Q2	?	?	(Kerr 1990: 230)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2292	V1	?	?	(Kerr 1990: 230)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2295	E1	Central Peten	?	(Kerr 1990: 233)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2323	H1	Central Peten	?	(Kerr 1990: 234)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2323	Q4	Central Peten	?	(Kerr 1990: 234)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2358	E1	Central Peten	?	(Kerr 1990: 242)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2583	E1	Central Peten	?	(Kerr 1990: 246)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K2669	I1	?	?	(Kerr 1990: 254)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2695	E1	?	?	(Kerr 1990: 255)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2723	F1	Central Peten	?	(Kerr 1990: 275)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2773	E1	Central Peten	?	(Kerr 1990: 286)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2777	E1	Central Peten	?	(Schele and Miller 1986: pl. 73a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2783	Q4	?	?	(Schele and Miller 1986: pl. 68a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K2787	D1	?	?	(Kerr 1990: 292)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K2873	E1	?	?	(Schele and Miller 1986: pl. 47a)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K2928	E1	?	?	(Kerr 1990: 299)
yu=k'i=ba	*y-uk'-ib-Ø*	3INSTR	1.b.ii	COL	K3025	B1	Central Peten	?	(Kerr 1992: 379)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3026	B4	?	?	(Kerr 1992: 380)

yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3033	G1	Central Peten	?	(Reents-Budet 1994: 274)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K3034	G1	Hondo	?	(Reents-Budet 1994: 201)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3035	I1	?	?	(Persis Clarkson n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3046	F1	?	?	(Barbara van Heusen n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3059	E1	?	?	(Jim Crocker n.p.)
yu=k'i=bi=na	*y-uk'-ib-?-Ø*	3INSTR	1.b.i	COL	K3060	K1-L1	?	?	(Persis Clarkson n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K3064	A1	?	?	(Persis Clarkson n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3066	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K3134	A1	?	?	(Kerr 1992: 388)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3229	E1	Central Peten	?	(Kerr 1992: 393)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3230	D1	Central Peten	?	(Kerr 1992: 394)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K3248	A1	Central Peten	?	(Kerr 1992: 398)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3366	G1	Central Peten	?	(Kerr 1992: 408)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3390	H1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3412	I1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3433	E1	?	?	(Kerr 1992: 417)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3461	H1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3472	E1	Central Peten	?	(Kerr 1992: 422)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	COL	K3478	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3684	E1	?	?	(Kerr 1992: 427)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3699	F1	?	?	(Kerr 1992: 429)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K3861	A1	?	?	(Kerr 1992: 444)
yu=k'i	*y-uk'-i[b]-Ø*	3INSTR	1.g.i	COL	K3924	K1	?	?	(Kerr 1992: 446)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K3996	H1	?	?	(Kerr 1992: 449)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4020	A3	?	?	(Kerr 1992: 454)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4021	F1	?	?	(Kerr 1992: 455)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K4114	A1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4143	D1-E1	?	?	(Kerr 1992: 465)
yu=k'i=bi=li	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K4143	F1	?	?	(Kerr 1992: 465)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4340	F1	?	09.14	(Kerr 1992: 474)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4354	E1	Central Peten	?	(Kerr 1992: 475)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4357	J1-K1	?	?	(Kerr 1992: 477)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4375	H1	?	?	(Kerr 1992: 481)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4379	E1	?	?	(Kerr 1992: 484)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4386	E1	?	?	(Kerr 1992: 486)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4467	A1	?	?	(Kerr 1990: 312)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4477	A1	?	?	(Kerr 1990: 314)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4542	B1	?	?	(Kerr 1990: 317)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4546	A1	?	?	(Kerr and Kerr 1997: 733)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4551	K1-L1	?	?	(Kerr 1994: 552)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4552	K1-L1	?	?	(Kerr 1994: 552)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4605	K1-L1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4619	C1	Central Peten	?	(Kerr 1994: 564)

yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4644	E1	Central Peten	?	(Kerr 1994: 572)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4681	D1	Yucatan	?	(Kerr 1994: 589)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K4681	H1	Hondo	?	(Kerr 1994: 586)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4689	G1	?	?	(Kerr 1994: 592)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K4824	H1	?	?	(Kerr 1994: 600)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4945	E1	?	?	(Kerr 1994: 621)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4946	E1	?	?	(Justin Kerr n.p.)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	COL	K4959	I1	?	?	(Kerr 1994: 626)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4962	K1-L1	?	?	(Kerr 1994: 635)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K4964	G1	?	?	(Kerr 1994: 629)
yu=k'i	*y-uk'-i[b]*	3INSTR	1.g.i	COL	K4988	I1	?	?	(Kerr 1994: 635)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4991	A1	Central Peten	?	(Kerr 1994: 638)
yu=bi	*y-u[k']-[i]b*	3INSTR	2.g.i	COL	K4992	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	COL	K4995	I1	Central Peten	?	(Kerr 1994: 639)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K4997	D1	Central Peten	?	(Kerr 1994: 639)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5006	I1	?	?	(Kerr 1994: 645)
yu=k'i=TE'	*y-uk'-i[b]*	3INSTR	1.g.i	COL	K5016	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5018	A1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5018	B1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5043	G1	?	?	(Kerr and Kerr 1997: 747)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5057	E1	Central Peten	?	(Kerr and Kerr 2000: 914)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5058	E1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5060	E1	?	?	(Kerr and Kerr 2000: 915)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5062	G1	?	?	(Kerr and Kerr 2000: 916)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5064	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=li=bi	*y-uk'-l-ib*	3INSTR	1.f.ii	COL	K5070	J1-K1	?	?	(Kerr and Kerr 2000: 919)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5073	F1	?	?	(Reents-Budet 1994: 86)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	COL	K5084	I1-J1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5110	A2	?	?	(Kerr and Kerr 1997: 756)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5193	A1	?	?	(Kerr and Kerr 1997: 770)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5196	E1	?	?	(Kerr and Kerr 1997: 771)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5197	A1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5198	K1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5229	F1	Central Peten	?	(Kerr and Kerr 1997: 777)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5241	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i	*y-uk'-i[b]-Ø*	3INSTR	1.g.i	COL	K5350	L1	?	?	(Kerr and Kerr 1997: 780)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5350	X1-Y1	?	?	(Kerr and Kerr 1997: 780)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5356	E1	Central Peten	?	(Reents-Budet 1994: 185)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5357	A1	?	?	(Kerr and Kerr 1997: 784)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5360	E1	Central Peten	?	(Kerr and Kerr 1997: 785)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5364	E1	?	?	(Kerr and Kerr 1997: 786)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5366	E1	Central Peten	?	(Kerr and Kerr 1997: 788)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5390	C1	?	?	(Kerr and Kerr 2000: 930)

yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5391	F1	Central Peten	?	(Kerr and Kerr 2000: 931)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5424	E1	Central Peten	?	(Justin Kerr n.p.)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	COL	K5446	H1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5452	H1	?	?	(Kerr and Kerr 1997: 803)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5452	V1	?	?	(Kerr and Kerr 1997: 803)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5454	G1	?	?	(Kerr and Kerr 1997: 805)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5454	H1	?	?	(Kerr and Kerr 1997: 805)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5456	L1	?	?	(Kerr and Kerr 1997: 807)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5465	L1-M1	?	?	(Coe 1973: #39)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5466	2	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5509	N1	?	?	(Coe 1973: #38)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5514	A1	?	?	(Coe 1973: 219)
yu=k'i=ba	*y-uk'-ib-Ø*	3INSTR	1.b.ii	COL	K5514	C1	?	?	(Coe 1973: 219)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5515	A1	?	?	(Coe 1973: #52)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5567	F1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5568	F1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5605	A3	Southern Peten	?	(Kerr and Kerr 1997: 811)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5605	B3	Southern Peten	?	(Kerr and Kerr 1997: 811)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5629	E1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5635	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5644	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5646	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5648	C1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5658	K1-L1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5720	E1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5721	E1	Central Peten	?	(Kerr and Kerr 2000: 935)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5722	E1	Central Peten	?	(Kerr and Kerr 1997: 819)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5763	A4	?	?	(Kerr and Kerr 2000: 937)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5847	G1	?	?	(Kerr and Kerr 2000: 943)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5857	E1	?	?	(Kerr and Kerr 1997: 821)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5930	D1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5976	B1	Central Peten	?	(Kerr and Kerr 2000: 950)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K5977	C1	Central Peten	?	(Kerr and Kerr 2000: 951)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K5979	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6055	B1	Yucatan	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6059	E1	?	?	(Kerr and Kerr 1997: 825)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6060	D1	Central Peten	?	(Kerr and Kerr 1997: 826)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6167	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6290	A3	Southern Peten	?	(Kerr and Kerr 2000: 955)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6294	A5	?	?	(Kerr and Kerr 2000: 957)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6315	G1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6394.1	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6394.2	E1	?	?	(Justin Kerr n.p.)

yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6418	G2	Central Peten	?	(Kerr and Kerr 2000: 963)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6426	E1	Central Peten	?	(Kerr and Kerr 2000: 965)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6426A	F1	Central Peten	?	(Kerr and Kerr 2000: 965)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6434	A3	Southern Peten	?	(Kerr and Kerr 2000: 966)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6437	N4	?	?	(Kerr and Kerr 2000: 967)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6538	G1	?	?	(Kerr and Kerr 2000: 971)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6551	E1	Central Peten	?	(Grube and Gaida 2006: fig. 33.2)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6555	B1	Yucatan	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6611	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6617	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6618	K1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6619	A1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6659	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6751	M5	Central Peten	?	(Martin 1997: fig. 1a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K6755	E1	Central Peten	?	(Kerr and Kerr 2000: 978)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K6998	G1	Yucatan	?	(Kerr and Kerr 1997: 837)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7055	E1	Central Peten	?	(Krempel and Matteo 2012: fig. 5d)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	COL	K7147	L1	Central Peten	?	(Kerr and Kerr 2000: 985)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7164	A1	Yucatan	?	(Kerr and Kerr 2000: 984)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7190	F1	?	?	(Kerr and Kerr 2000: 990)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7190	G1	?	?	(Kerr and Kerr 2000: 990)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7220	J1-K1	Central Peten	?	(Kerr and Kerr 2000: 991)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7224	E1	Southern Peten	?	(Kerr and Kerr 2000: 992)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7268	H1	?	?	(Kerr and Kerr 2000: 994)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7432	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7459	E1	Central Peten	?	(Krempel and Matteo 2012: fig. 10d)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7460	F1	?	?	(Kerr and Kerr 2000: 998)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7461	A2	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7524	F1	Central Peten	?	(Kerr and Kerr 2000: 999)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7528	A1	Central Peten	08.18	(Martin and Grube 2000: 31)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7669	A1	?	?	(Kerr and Kerr 2000: 1001)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7727	K1	?	?	(Kerr and Kerr 2000: 1005)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7749	A1	?	?	(Kerr and Kerr 2000: 1006)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7794	H1	?	?	(Kerr and Kerr 2000: 1007)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7795	F1	?	?	(Kerr and Kerr 2000: 1008)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K7821	F1	?	?	(Kerr and Kerr 2000: 1010)
yu=k'i=ta	*y-uk'-i[b]*	3INSTR	1.g.i	COL	K7912	C1	?	?	(Kerr and Kerr 2000: 1011)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K7979	L1	Central Peten	?	(Justin Kerr n.p.)
ta yu=k'i	*ta y-uk'-i[b]*	3INSTR	1.g.i	COL	K8075	F1	?	?	(Kerr and Kerr 2000: 1015)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8076	G1	?	?	(Kerr and Kerr 2000: 1016)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8088	C1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8123	A5	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8220	B1	?	?	(Justin Kerr n.p.)

k'i=bi	*[y-u]k'-ib-Ø*	3INSTR	1.b.i	COL	K8234	L1	?	?	(Kerr and Kerr 2000: 1020)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8242	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8242	V1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8257	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8266	F1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8339	K1-L1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8393	J1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8418	J1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8425	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8457	E1	?	?	(Justin Kerr n.p.)
yu=k'i=ba	*y-uk'-ib-Ø*	3INSTR	1.b.ii	COL	K8461	A3	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8479	pC1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8497	A5	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8498	A1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8504	F1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8506	H1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8575	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8622	C1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8622	P1	Central Peten	09.14	(Beliaev and Davletshin 2006: fig. 8)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8651	E1	Central Peten	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8660	E1-F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8665	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8685	B5	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8719	F1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	K8722	G1	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8732	B3	?	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8740	G1	Yucatan	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	K8741	A5-B5	Yucatan	?	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Lidded Vessel	A1	?	?	(Boot 2005b: fig. 7)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	MNAE 15889	D1	Central Peten	?	(Sven Gronemeyer DSC04449)
yu=k'i=tzi	*y-uk'-i[b]*	3INSTR	1.g.i	COL	Mus. Sta. Barbara	B1	?	?	(Sven Gronemeyer 23-000017)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Mus. Sta. Barbara	pC1	?	?	(Sven Gronemeyer 24-000005)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Museo Chiclero	B1	Central Peten	?	(Boot 2005b: fig. 2)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Museo Chiclero	pB1	?	?	(Sven Gronemeyer 20-000019)
u=u=k'i=bi	*[y-]uk'-ib-Ø*	3INSTR	1.b.i	COL	Museo Chiclero	pC1	?	?	(Sven Gronemeyer 20-000017)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	COL	Soth. NY Lot 171	F1	?	?	(Sebastian Matteo n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Teotihuacan Style	A1	?	?	(Boot 2005b: fig. 4)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Teotihuacan Style	A1	?	?	(Boot 2005b: fig. 5)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	COL	Teotihuacan Style	A1	?	?	(Boot 2005b: fig. 6)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	COL	Tun Shell	A1	?	09.00	(Stuart 2001b: fig. 3)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	CRC	Str. 4L6 Vessel	E1	Mopan-Pusilha	09.15	(Chase and Chase 1987: fig. 38)
yu=bi=li	*y-u[k']-[i]b-il-Ø*	3INSTR	2.g.i	CRN	El Jobillo Gr. 2	D1-E1	Central Peten	09.15	(Rodrigo Guzmán 2012: fig. 4.13)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	CUY	Vessel	C1	Mopan-Pusilha	09.18	(Helmke et al. 2012: fig. 8)

yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	DPL	K2784	E1	Pasion	?	(Kerr 1990: 291)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	EKB	Msc. 5	A2	Yucatan	10.00	(Lacadena 2002: fig. 27)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MS	1838	E1	?	?	(Sebastian Matteo n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K633	C1	Central Peten	09.16	(Reents-Budet 1994: 63)
yu=UK'=bi	*y-uk'-ib-Ø*	3INSTR	3.a.i	NAR	K635	E1	Central Peten	?	(Robicsek and Hales 1982: #183)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	MTL	K791	G1	Central Peten	09.16	(Kerr 1989: 49)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K927	C1	Central Peten	09.13	(Coe 1982: #60)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MTL	K1004	B1	Central Peten	09.15	(Robicsek and Hales 1982: #186)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	MTL	K1728	H1	Central Peten	09.16	(Kerr 1989: 105)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MTL	K4996	C1	Central Peten	09.15	(Kerr 1994: 640)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	MTL	K5418	D1	Central Peten	09.16	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MTL	K5850	E1	Central Peten	?	(Kerr and Kerr 2000: 944)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	MTL	K6547	C1	Central Peten	?	(Kerr and Kerr 2000: 972)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MTL	K8176	E1	Central Peten	?	(Kerr and Kerr 2000: 1018)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	MTL	K8286	E1	Central Peten	09.15	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K1398	8	Central Peten	09.13	(Kerr 1989: 81)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K1558	J1	Central Peten	09.07	(Robicsek and Hales 1982: fig. 32)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K1698	C1	Central Peten	?	(Kerr 1989: 104)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K2085	C1	Central Peten	09.13	(Kerr 1990: 214)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K2796	C1	Central Peten	?	(Coe 1973: #49)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K4464	C1	Central Peten	09.13	(Reents-Budet 1994: 99)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K4562	D1	Central Peten	09.05	(Kerr 1994: 553)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K4958	D1	Central Peten	?	(Kerr 1994: 624)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	NAR	K5042	E1	Central Peten	09.05	(Kerr and Kerr 1997: 746)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K5723	C1	Central Peten	?	(Reents-Budet 1994: 84)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K5764	H1-I1	Central Peten	09.05	(Kerr and Kerr 1997: 820)
yu=k'i=bi=la	*y-uk'-ib-il-Ø*	3INSTR	1.b.i	NAR	K6813	A1	Central Peten	09.07	(Kerr and Kerr 2000: 980)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K7716	D1	Central Peten	09.08	(Kerr and Kerr 2000: 1003)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	NAR	K7750	C1	Central Peten	09.17	(Grube 1998a)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	OXK	COL Vessel	E1	Yucatan	09.16	(Boot 2010b: fig. 4)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	OXK	Grupo May p3	pB1	Yucatan	09.16	(Alfonso Lacadena n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	OXK	K3199	G1	Yucatan	09.16	(Kerr 1992: 309)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	OXK	K4378	G1	Yucatan	09.16	(Alfonso Lacadena n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	PAL	K4332	A1	Tabasco	08.19	(Kerr 1992: 471)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	PCH	PCH 25B-1-6	C1	Pasion	09.02	(Eberl 2007: fig. 3.8a)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	Babylas	E1	Central Peten	?	(Sebastian Matteo n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	RAZ	Bur. 19 V. 15	B1	Central Peten	09.02	(Adams 1999: fig. 3.41)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	IDAEH Cer. 34-4	pA1	Central Peten	?	(Sven Gronemeyer DSC03767)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	K1383	A5	Central Peten	?	(Kerr 1989: 78)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	RAZ	K1446	A1	Central Peten	?	(Kerr 1989: 84)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	K2914	E1	Central Peten	?	(Kerr 1990: 297)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	K3744	E1	Central Peten	?	(Kerr 1992: 433)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	K5022	A4	Central Peten	?	(Kerr and Kerr 1997: 736)

yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	RAZ	K7720	A5	Central Peten	?	(Kerr and Kerr 2000: 1004)
u-k'i=bi=la	*uk'-ib-il-Ø*	3INSTR	1.b.i	RAZ	K8042	E1	Central Peten	09.02	(Lopes 2005b: fig. 1)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	SAA	K558	E1	Southern Peten	?	(Reents-Budet 1994: 257)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	SAA	K558	Q5	Southern Peten	?	(Reents-Budet 1994: 257)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	K3395	H1	Central Peten	09.12	(Reents-Budet 1994: 272)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	K4961	F1	Central Peten	09.08	(Justin Kerr n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	K4976	F1	Central Peten	?	(Kerr 1994: 634)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	K4976	R1	Central Peten	?	(Kerr 1994: 634)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	TIK	K5453	G1	Central Peten	09.12	(Kerr and Kerr 1997: 804)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	MT 219	G1	Central Peten	09.09	(Moholy-Nagy 2008: fig. 227)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	TIK	MT 58	E1	Central Peten	09.15	n/a
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	TIK	MT 73	pA1	Central Peten	?	n/a
yu=k'i	*y-uk'-i[b]*	3INSTR	1.g.i	TIK	MT 98	E1	Central Peten	09.12	(Culbert 1993: Fig. 48a)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	TIK	MT. 13	A1	Central Peten	08.17	(Culbert 1993: fig. 26b)
u=k'i=bi	*uk'-ib-Ø*	3INSTR	1.b.i	TIK	MT. 14	A1	Central Peten	08.17	(Culbert 1993: fig. 26c)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TIK	MT. 16	D1	Central Peten	09.06	(Culbert 1993: fig. 42c)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	TIK	MT. 176	A1	Central Peten	09.16	(Culbert 1993: fig. 84)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	TIK	MT 3	A1	Central Peten	08.18	(Culbert 1993: fig. 19c)
yu=UK'	*y-uk'[-ib]-Ø*	3INSTR	2.g.ii	TIK	MT 4	A1	Central Peten	08.18	(Culbert 1993: fig. 19a)
yu=UK'	*y-uk'[-ib]*	3INSTR	2.g.ii	TIK	MT 5	C1	Central Peten	08.18	(Culbert 1993: fig. 19b)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	TPX	Veracal Sherd	B1	Central Peten	?	(Hermes 2000: fig. 141.4)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	UAX	Bur. A-31 Vessel	A1	Central Peten	?	(Smith 1955: fig. 81s)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	UAX	Canberra Tripod	A1	Central Peten	?	(Peter Mathews n.p.)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	UAX	Canberra Tripod	B1	Central Peten	?	(Peter Mathews n.p.)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	UAX	Cer. 13-10	pC1	Central Peten	?	(Sven Gronemeyer DSC03690)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	UAX	IDAEH Cer. 13-10	pC1	Central Peten	?	(Sven Gronemeyer DSC03669)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	UAX	IS Vase	K1-L1	Central Peten	?	(Smith 1932: pl. 5)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K1547	E1	Central Peten	?	(Robicsek and Hales 1982: #184)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K1837	E1	Central Peten	?	(Kerr 1989: 116)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	XUL	K3500	A1	Central Peten	09.16	(Kerr 1992: 423)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K3743	E1	Central Peten	09.16	(Kerr 1992: 432)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K4387	E1	Central Peten	09.16	(Kerr 1992: 487)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K4388	E1	Central Peten	09.16	(Kerr 1992: 488)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K4572	E1	Central Peten	09.16	(Kerr 1994: 555)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K4572	E1	Central Peten	09.16	(Kerr 1994: 555)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K4909	E1	Central Peten	09.16	(Kerr 1994: 610)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K8007	E1	Central Peten	09.16	(Kerr and Kerr 2000: 1012)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K8015	E1	Central Peten	?	n/a
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	XUL	K8728	E1	Central Peten	09.16	(Krempel and Matteo 2012: fig. 4)
yu=k'i=bi	*y-uk'-ib*	3INSTR	1.b.i	ZBP	K1387	G1	Western Peten	?	(Robicsek and Hales 1982: #170)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	ZBP	K2803	H1	Western Peten	?	(Schele and Miller 1986: pl. 96a)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	ZBP	K3844	E1	Western Peten	?	(Kerr 1992: 443)
yu=k'i=bi	*y-uk'-ib-Ø*	3INSTR	1.b.i	ZTZ	K679	A1	Central Peten	?	(Kerr 1989: 33)

yu=UK'=ji chi-hi	*y-uk'-[u]j-Ø chih*	4TEMP	2.e.ii	CPN	Alt.		Motagua	09.18	(Boot 2009b: 51)

ut – VER.INTR: "to fructify, to wear fruits"

yu=ti=bi	*y-ut-ib*	3INSTR	1.c.i	PAL	TI-W	K4	Tabasco	09.12	(Robertson 1983b: fig. 97)
yu=ti=bi	*y-ut-ib*	3INSTR	1.c.i	PAL	TI-W	K5	Tabasco	09.12	(Robertson 1983b: fig. 97)
yu=ti=bi	*y-ut-ib*	3INSTR	1.c.i	PAL	TI-W	K6	Tabasco	09.12	(Robertson 1983b: fig. 97)

utz – ADJ: "good"

ti u-tzu=ja=la	*ti utz-j-al*	1INCH	2.f.ii	CLK	Bur. 4 Stco. Frg. 4	pD1	Central Campeche	09.12	(Simon Martin n.p.)
u-tza=ja	*utz-aj-Ø*	1INCH	1.b.i	TNA	Mon. 111	K1	Chiapas	09.13	(Graham and Mathews 1999: 145)
u-tzu=lu ba	*utz-ul ba[h]-Ø*	1ATTR	1.a.i	CML	U. 26 Sp. 5	A8-A9	Tabasco	09.16	(Marc Zender n.p.)

uxul – NOUN: "carving"

u-xu-lu=ja	*uxul-[a]j-Ø*	1INCH	2.a.i	CRN	P. 2	O7	Central Peten	09.12	(Mayer 1995: pl. 161)

uxul-V – VER.TR.D: "to carve"

u-xu-lu=k'a	*uxul-k'-a[j]-Ø*	1MED	1.g.i	TIK	Bn. Mundo Perd.	A1	Central Peten	09.16	(Laporte 1999: fig. 6b)
yu=xu=na=ja=la	*y-uxu[l]-n-aj-al-Ø*	1PASS	1.f.ii	BVC	Bu. 88-1-2 Bone	C1-D1	Mopan-Pusilha	09.18	(Helmke et al. 2008: fig. 4)
u-xu-lu=na	*uxul-n-a[j]-Ø*	1PASS	1.f.i	CHN	T1L-L1	C1	Yucatan	10.04	(Graña-Behrens 2002: pl. 31)
u-xu-lu=na	*uxul-n-a[j]-Ø*	1PASS	1.f.i	CHN	T4L-L4	A2	Yucatan	10.02	(Krochock 1989: fig. 7)
u-xu-lu=na=ja	*uxul-n-aj-Ø*	1PASS	1.f.ii	CHN	MON-L3	A1	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 57)
u-xu-lu=na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	MON-L2	B5	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 56)
u-xu-lu=na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	T4L-L1	A4-B4	Yucatan	10.02	(Krochock 1989: fig. 4)
u-xu-lu=na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	T4L-L1	E2-F2	Yucatan	10.02	(Krochock 1989: fig. 4)
u-xu-lu=na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	T4L-L2	B3-A4	Yucatan	10.02	(Krochock 1989: fig. 5)
u-xu-lu=na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	T4L-L4	B4-A5	Yucatan	10.02	(Krochock 1989: fig. 7)
u-xu-lu=na=ja=la	*uxul-n-aj-al-Ø*	1PASS	1.f.ii	CHN	T4L-L3	A2-B2	Yucatan	10.02	(Krochock 1989: fig. 6)
u-xu-lu=na=ja=li	*uxul-n-aj-al-Ø*	1PASS	1.f.ii	CHN	IS-LU	C3-D3	Yucatan	10.02	(Krochock 1989: fig. 1)
u-xu-lu=na=ja=li	*uxul-n-aj-al-Ø*	1PASS	1.f.ii	CHN	IS-LU	E1-F1	Yucatan	10.02	(Krochock 1989: fig. 1)
u-xu-lu=na-na=ja=ki	*uxul-n-aj-ak-Ø*	1PASS	1.f.ii	CHN	T3L-L3	B2-C1	Yucatan	10.02	(Krochock 1989: fig. 3)
yu=xu-lu=ja=la	*y-uxul[-n]-[a]j-al-Ø*	1PASS	2.g.ii	CHN	MON-L4	D5-E5	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 58)
yu=xu-lu=ja=la	*y-uxul[-n]-[a]j-al-Ø*	1PASS	2.g.ii	CHN	MON-L5	D5-E5	Yucatan	10.02	(Grube, Lacadena and Martin 2003: 59)
yu=xu-lu=na	*y-uxul-n-a[j-al]-Ø*	1PASS	1.f.i	CHN	St. 2	A2	Yucatan	10.03	(Graña-Behrens 2002: pl. 28)
yu=xu-lu=ja=la	*y-uxul[-n]-[a]j-al-Ø*	1PASS	2.g.ii	COL	Berlin Ca 50113	C1-D1	Central Peten	?	(Grube and Gaida 2006: #33)
yu=xu=na=ja=li	*y-uxu[l]-n-aj-al-Ø*	1PASS	1.f.ii	COL	K4466	B3-A4	Yucatan	09.17	(Kerr 1990: 311)
yu=xu-lu=ja=la	*y-uxul[-n]-[a]j-al-Ø*	1PASS	2.g.ii	COL	K6551	C1-D1	Central Peten	?	(Grube and Gaida 2006: fig. 33.2)
yu=xu-lu=wa=ja=la	*y-uxul-w-aj-al-Ø*	1PASS	1.f.ii	CPN	Alt. Z	C1-D1	Motagua	09.17	(Maudslay 1974, I: pl. 112)
u-xu-lu=na=ja	*uxul-n-aj-Ø*	1PASS	1.f.ii	EKB	Msc. 2	A2	Yucatan	10.00	(Lacadena 2002: fig. 24)
u-xu-lu=na=ja	*uxul-n-aj-Ø*	1PASS	1.f.ii	UXM	BSc. 2	F1-G1	Yucatan	10.03	(Graham 1992: 120)

yu=xu-lu=na=ja=la	*y-uxul-n-aj-al-Ø*	1PASS	1.f.ii	XUL	Museo Chiclero	pB1-pC1	Central Peten	?	(Grube and Gaida 2006: fig. 33.3)
i u-xu-lu=yi	*i['] uxul-uy-i-Ø*	2MED	1.a.ii	COL	P. Emil. Zapata	D1	Tabasco	09.13	(Stuart 1990b: fig. 1)
yu=xu-lu=ji	*y-uxul-uj-Ø*	4TEMP	1.a.ii	PAL	96G	I4a	Tabasco	09.17	(Robertson 1991: fig. 265)

wam – VER.TR.R

wa-ma=wi	*wam-aw-Ø k'awil*	2ANTIP	1.a.ii	COL	P. Ballplayer	D1	?	09.15	(Tunesi 2007: fig. 3)
wa-ma=wi K'AWIL	*wam-aw-Ø k'awil*	2ANTIP	1.a.ii	QRG	St. I	C5	Motagua	09.18	(Looper 2001: fig. 6)

way – NOUN: "co-essence"

WAY=ja	*way-[a]j-Ø*	1INCH	2.e.i	COL	Msc. Covarrubis	A1	?	?	(Grube and Martin 2001: 31)

way – VER.INTR: "to sleep"

waWAY=bi	*way-[a]b*	3INSTR	3.a.ii	ALM	St. 10	Yp1	Central Peten	09.15	(Grube 2008: fig. 8.2)
ch'o-ko WAY=bi	*ch'ok way-[a]b*	3INSTR	3.a.ii	CAY	Lnt. 1	A15	Usumacinta	09.17	(John Montgomery n.p.)
AJ CHAK WAY=bi	*aj chak way-[a]b*	3INSTR	3.a.ii	CAY	Alt. 4	C2	Usumacinta	09.15	(Mathews 1998: fig. 1)
AJ CHAK WAY=bi	*aj chak way-[a]b*	3INSTR	3.a.ii	CAY	Alt. 4	T1	Usumacinta	09.15	(Mathews 1998: fig. 2)
waWAY=bi	*way-[a]b*	3INSTR	3.a.ii	COL	Lnt. Retalteco	pM3	Usumacinta	09.16	(Houston et al. 2006b: fig. 2)
YAX WAY=bi	*yax way-[a]b*	3INSTR	3.a.ii	COL	Yax Wayib	B3	Central Peten	09.00	(Houston and Inomata 2009: fig. 2.3)
CHAKka to-ko WAY=bi	*chak tok way-[a]b*	3INSTR	3.a.ii	COL	Bn. Needle	B8-B9	?	?	(Houston and Stuart 2001: fig. 3.2)
tu=WAY=bi=li	*t-u-way-[i]b-il*	3INSTR	3.a.i	COL	P. Caracas	B8	Usumacinta	09.16	(Bíró 2005: fig. 9)
tu=WAY=bi=li	*t-u-way-[i]b-il*	3INSTR	3.a.i	COL	P. Caracas	C10	Usumacinta	09.16	(Bíró 2005: fig. 9)
ch'o-ko wa-ya=bi	*ch'ok way-ab*	3INSTR	1.a.ii	COL	P. Stokes	E1	Usumacinta	09.17	(Mayer 1991: pl. 118)
waWAY-ya=bi	*way-ab*	3INSTR	1.a.ii	COL	P. Berman	A6	Usumacinta	09.17	(Mayer 1989: pl. 76)
IX WAY-ya=ba	*ix way-ab*	3INSTR	1.a.i	COL	K1382	F1	?	?	(Robicsek and Hales 1982: #12)
CHAK to WAY	*chak to[k] way[-ab]*	3INSTR	2.g.ii	COL	K2358	P1	Central Peten	?	(Kerr 1990: 242)
IX WAY=bi	*ix way-[a]b*	3INSTR	3.a.ii	COL	K5164	I3	?	?	(Kerr and Kerr 2000: 926)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	CPN	Alt. N1	A1	Motagua	09.17	(Baudez 1994)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	CPN	Alt. N2	B1	Motagua	09.17	(Baudez 1994)
EK' ? waWAY=bi	*ek' ? way-[i]b-Ø*	3INSTR	3.a.i	CPN	T. 22a Stone	C1	Motagua	09.18	(Schele et al. 1989: fig. 29)
u=WAY=bi	*u-way-[i]b-i[l]*	3INSTR	3.a.i	CPN	T. 22a Stone	D1	Motagua	09.18	(Schele et al. 1989: fig. 29)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	CRN	P. 1	B2	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	CRN	P. 1	E4	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	CRN	P. 1	R2b	Central Peten	09.12	(Canuto et al. 2008: fig. 2.1)
CHAK waWAY=bi	*chak way-[a]b*	3INSTR	3.a.ii	DCB	St. 2	I1b	Usumacinta	09.14	(Cougnaud et al. 2003: fig. 7)
u=wa-ya=bi=li	*u-way-ab-il-Ø*	3INSTR	1.a.ii	IKL	Lnt. 1	C1	Yucatan	?	(Stuart 1998: 400)
ba waWAY=bi	*ba[h] way-[a]b*	3INSTR	3.a.ii	LTI	P. 1	B2	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
ba waWAY=bi	*ba[h] way-[a]b*	3INSTR	3.a.ii	LTI	P. 1	L1	Usumacinta	09.17	(Schele and Miller 1986: fig. III.5)
ba waWAY=bi	*ba[h] way-[a]b*	3INSTR	3.a.ii	LTI	P. 2	C2	Usumacinta	09.16	(Mayer 1995: pl. 265)
IX WAY-ya=ba	*ix way-ab*	3INSTR	1.a.i	MTL	K1728	E1-G1	Central Peten	09.16	(Kerr 1989: 105)
CHIT WAY-ya=bi	*chit way-[a]b*	3INSTR	3.a.ii	PAL	PT	F12	Tabasco	09.14	(Robertson 1985b: fig. 258)

K'INICH TAJ WAY=bi	*k'inich taj way-[i]b*	3INSTR	3.a.i	PAL	TS	D1	Tabasco	09.12	(Robertson 1991: fig. 95)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	PAL	TS	O5	Tabasco	09.12	(Robertson 1991: fig. 95)
tu=WAY=bi=li	*t-u-way-[i]b-il*	3INSTR	3.a.i	PAL	P. DOAKS 2	B5	Tabasco	09.14	(Coe and Benson 1966: fig. 8)
u=WAY=bi=li	*u-way-[i]b-il-Ø*	3INSTR	3.a.i	PNG	P. 12	M1	Usumacinta	09.04	(Teufel 2004: 515)
CHAK TOK WAY=bi	*chak tok way-[a]b*	3INSTR	3.a.ii	SUF	M. 9	C3	Central Peten	08.17	(Estrada-Belli et al. 2009: fig. 7)
CHAK to WAY=bi	*chak to[k] way-[a]b*	3INSTR	3.a.ii	TIK	Alt. 8	B1	Central Peten	09.15	(Jones and Satterthwaite 1982: fig. 30)
? ?-WAY=bi	*? way-[a]b*	3INSTR	3.a.ii	TIK	MT. 214	pA1	Central Peten	?	n/a
tu=WAY=bi=li	*t-u-way-[i]b-il*	3INSTR	3.a.i	TNA	Frg. 91	pD2	Chiapas	?	(Peter Mathews n.p.)
K'AN to-ko ^{wa}WAY=ib	*k'an tok way-[a]b*	3INSTR	3.a.ii	YAX	Lnt. 6	B6	Usumacinta	09.16	(Graham and von Euw 1977: 23)
K'AN^{na} to-ko ^{wa}WAY=ib	*k'an tok way-[a]b*	3INSTR	3.a.ii	YAX	Lnt. 8	D1-D2	Usumacinta	09.16	(Graham and von Euw 1977: 27)
tu=WAY=bi=li	*t-u-way-[i]b-il*	3INSTR	3.a.i	YAX	Lnt. 10	E1a	Usumacinta	09.18	(Graham and von Euw 1977: 31)
? WAY=bi	*? way-[a]b*	3INSTR	3.a.ii	YAX	Lnt. 37	D4	Usumacinta	09.04	(Graham 1979: 83)
ba ^{wa}WAY=bi	*ba[h] way-[a]b*	3INSTR	3.a.ii	ZPB	K4692	B6	Western Peten	09.11	(Fitzsimmons 2012: fig. 3)

we' – VER.INTR: "to eat"

u=WE'=i-bi	*u-we'-ib-Ø*	3INSTR	1.e.i	COL	K5460	L1-O1	?	?	(Reents-Budet 1994: 281)
u=WE'=i-bi	*u-we'-ib-Ø*	3INSTR	1.e.i	COL	K6080	H1-J1	?	?	(Kerr and Kerr 2000)
wa WE'=la	*wa['] we'-[e]l*	3NMLS	4.a.i	PAL	K'TOK	pD5b	Tabasco	09.16	(Bernal Romero 2002: fig. 10)
wa WE'=la	*wa['] we'-[e]l*	3NMLS	4.a.i	PAL	K'TOK	pD10b	Tabasco	09.16	(Bernal Romero 2002: fig. 12)
wa WE'=la	*wa['] we'-[e]l*	3NMLS	4.a.i	PAL	K'TOK	pF6b	Tabasco	09.16	(Bernal Romero 2002: fig. 13)
wa WE'=la	*wa['] we'-[e]l*	3NMLS	4.a.i	PAL	K'TOK	pI4b	Tabasco	09.16	(Bernal Romero 2002: fig. 16)

wis – VER.TR.R: "to cut"

wi-sa	*wi<h>s-a[j]-Ø*	1PASS	1.g.i	C Ma.	40a	C1	Yucatan	11.11	(Anders 1967: 40)

witz – NOUN: "mountain"

WITZ=ja JOL	*witz-[a]j-Ø jol*	1INCH	2.e.i	TRT	Mon. 6	H6	Tabasco	09.11	(Gronemeyer 2006b: pl. 12)
WITZ=ja u=JOL=li	*witz-[a]j-Ø u-jol-[i]l*	1INCH	2.e.i	DPL	HS. 2 W III	C1	Pasion	09.12	(Fahsen 2002: fig. 8)
wi-tzi=ja	*witz-[a]j-Ø*	1INCH	2.a.i	CML	U. 26 Sp. 6	A2	Tabasco	09.16	(Marc Zender n.p.)

wol – VER.TR.R: "to encircle"

u=wo-lo=wa	*u-wol-o-Ø*	2IND	1.a.ii	CPN	HS. 1 XII	J1a	Motagua	09.16	(Barbara Fash n.p.)
wo-lo=yi	*wol-oy-i-Ø*	2MED	1.a.ii	MTL	K793	F1	Central Peten	?	(Kerr 1989: 50)

xin – ADJ: "stinking"

xi-ni=li	*xin-il*	1ATTR	1.a.i	NAR	K927	S2	Central Peten	09.13	(Coe 1982: #60)

xot' – VER.TR.R: "to cut / to split"

xo-t'o=lo	*xot'-ol-Ø*	3NMLS	1.a.i	CPN	St. E	D7	Motagua	09.13	(Schele 1990b: fig. 5)

xoy – VER.TR.R: "to bend / to circle"

xo-ya=ja	*xo<h>y-aj-Ø*	1PASS	1.b.i	YAX	St. 18	B4	Usumacinta	09.15	(Tate 1992: fig. 145)

yal – VER.TR.R: "to throw"

ya-la=ja	*ya<h>l-aj-Ø*	1PASS	1.a.i	AML	P. 2	A3	Pasion	09.18	(Houston 1993: fig. 3.21)
ya-la=ja	*ya<h>l-aj-Ø*	1PASS	1.a.i	CML	U. 26 Sp. 7	A3	Tabasco	09.17	(Marc Zender n.p.)
ya-la=ja	*ya<h>l-aj-Ø*	1PASS	1.a.i	CML	U. 26 Sp. 7	A9	Tabasco	09.17	(Marc Zender n.p.)
ya-la=ja	*ya<h>l-aj-Ø*	1PASS	1.a.i	COL	K3478	P3	?	?	(Justin Kerr n.p.)
ya=AL-la=ja	*ya<h>l-aj-Ø*	1PASS	1.a.i	COL	Lnt. 2 Site R	A2	Usumacinta	09.14	(Stefanie Teufel n.p.)
ya-AL=ji=ya	*ya<h>l-j-Ø=iy*	1PASS	2.f.ii	PAL	TI-W	O11	Tabasco	09.12	(Robertson 1983b: fig. 97)
ya-AL=ja AKAN-?	*ya<h>l-[a]j-Ø akan ?*	1PASS	2.e.i	TRT	Mon. 8	B45	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)
ya=AL=ja	*ya<h>l-aj-Ø*	1PASS	2.e.i	YAX	Lnt. 10	A2b	Usumacinta	09.18	(Graham and von Euw 1977: 31)
ya-AL=wa	*yal-[a]w-Ø*	2ANTIP	2.e.i	AGT	St. 19	D2b	Pasion	09.17	(Houston 2014: fig. 12.8)
i AL=wa na-?-ki	*i['] [y]al-[a]w-Ø ?*	2ANTIP	2.e.i	AGT	St. 19	B7b	Pasion	09.17	(Houston 2014: fig. 12.8)
ya-AL=wa	*yal-[a]w-Ø*	2ANTIP	2.e.i	ALC	St. 1	Ep4	Central Peten	09.06	(Grube 2008: fig. 8.18)
ya-AL=wa	*yal-[a]w-Ø*	2ANTIP	2.e.i	COL	K2213	C1	?	?	(Kerr 1990: 224)

yatz' – VER.TR.R: "to squeeze"

ya-tz'a=hi	*ya<h>tz'-aj-Ø*	1PASS	1.a.ii	KNK	Lnt. 1	D1	Yucatan	09.15	(Graña-Behrens 2002: pl. 4)
i ya-tz'a=ja	*i['] ya<h>tz'-aj-Ø*	1PASS	1.a.i	PAL	T18S	D5	Tabasco	09.14	(Schele and Mathews 1979: no. 478)
ya-tz'a=ja	*ya<h>tz'-aj-Ø*	1PASS	1.a.i	TRT	Mon. 8	B46a	Tabasco	09.11	(Gronemeyer 2006b: pl. 16)

yax – ADJ: "green, fresh"

a ya=YAX=ja=la	*a[j] ya-yax-j-al*	1INCH	2.f.ii	IXZ	St. 4	A3	Mopan-Pusilha	09.17	(Graham 1980: 181)
YAX=JAL^{la} NAH	*yax-j-al nah-Ø*	1INCH	1.e.iv	RAZ	Bur. 6	East	Central Peten	09.00	(Acuña 2007: fig. 27)
IX YAX=ja=la	*ix yax-j-al*	1INCH	2.f.ii	YAX	Lnt. 14	C1	Usumacinta	09.15	(Graham and von Euw 1977: 37)

yetz' – NOUN: "reflection"

ye-tz'e=li	*yetz'-el-Ø*	1POSS	1.a.ii	TIK	MT 9	C1	Central Peten	09.01	(Moholy-Nagy 2008: fig. 139a)

yok – VER.TR.R: "to pierce"

yo-ko=yi	*yok-oy-i-Ø*	2MED	1.a.ii	CHN	T4L-L3	D2	Yucatan	10.02	(Krochock 1989: fig. 6)

yo-ko=yi	*yok-oy-i-Ø*	2MED	1.a.ii	CHN	T4L-L3	A5	Yucatan	10.02	(Krochock 1989: fig. 6)

yuk – VER.TR.R: "to tremble, to shake"

yu-ko=wa	*yuk-[u]w-Ø*	2ANTIP	2.b.i	PUS	St. E	Bp9	Mopan-Pusilha	09.15	(Prager 2002a, III: fig. 7)

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