

# Digital Religious Communication and the Facilitation of Social Resilience, Part 2: Empirical Test of the Theoretical Model. A Study of the Twitter Activity of Ecumenical and Social Justice-Oriented Groups during the COVID-19 Pandemic

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## ABSTRACT

As societies have sought to adapt to the (post-)pandemic realities, one of the most profound and far-reaching consequences has been a society-wide acceleration of the turn toward the digital. Following a crucial link between social media communication and resilience, the article (1) aims to investigate how “digital religious communication” on social media can be used to measure and assess ecclesial organizations’ social resilience. In a second step, the Twitter communication of 126 ecumenical and social justice-oriented organizations is then analyzed for how much they communicated about the pandemic during the early phases, for the sentiment of their communication, and for religious semantics and narratives used to address the pandemic. In doing so, the study (2) inquires after the role of communicating religious self-understandings in navigating the pandemic, deepening thereby understanding of the connection between “digital religious communication” and the facilitation of social resilience in the face of crisis.

## KEYWORDS

Digital religion; religious communication; social justice; diaconic; ecumenical; social resilience; social media; Twitter

## Introduction and research questions

As individuals, groups, and social systems have sought to adapt to the pandemic situation resiliently, central to their efforts since the outbreak of the pandemic has been the transition from “offline” to “online” modes. In turn, media usage increased rapidly across the board. (Saha 348) Especially social media platforms, having already “penetrated all areas of human social life, such as people’s daily life, education, and work”, advanced to become “the most important channel of communication” (Saha 349) for coping with the pandemic.

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Societal shifts toward the digital could also be observed among religious organizations. For example, an “overwhelming majority of [Christian] congregations, 80%,” (Brown 1) changed to hybrid service forms. While perceived to be a successful approach to resiliently navigating the situation, on the one hand, installing and integrating new technical equipment into prior non-digital routines also created new challenges for religious leaders, staff, and institutions on the other. (Campbell and Osteen 9–12)

The collection, curation, and availability of datasets containing quantitatively significant amounts of religious institutions’ social media communication – potentially from various platforms and including sufficient metadata tagging – has become critical for bibliographers and librarians in theology and religious studies, not only because of the increasing use of such data in research but also due to the societal significance of this curatorial work. The present article illustrates the way that theoretical framings inform the approach to data collection and organization in one particularly explicit instance: Specifically, the research project for which this framing presented here was developed sought to investigate the question of how groups attempted to navigate the pandemic digitally by looking at a carefully selected subset of religious organizations and their digital communications during the first 1.5 years of COVID-19.

Taking into account the importance of social media communication, the article presents research drawn from an empirically conducted study focused on the Twitter communications of Christian ecumenical and humanitarian organizations and investigating the following two research questions (RQ):

1. To what extent did official accounts with an ecumenical and social justice profile show themselves resilient through their Twitter communications during the COVID-19 pandemic since January 2020?
2. How did those Twitter accounts narrate the COVID-19 pandemic using semantic terms that explicitly reflect their religious self-understanding?

The first of the two proposed RQs (RQ1) analyses the resilience of the groups’ communications during the pandemic. This is done by looking at their “communication volume” (referred to as RQ1.1) and their “sentiment of communication” (referred to as RQ1.2). The second of the two RQs (RQ2) examines how ecclesial organizations used the language of Christian religion in responding to their encounter with the pandemic. These forms of analysis can provide valuable insights into the conduct and management of such organizations during crises and the impact of their communication on societal resilience. In this context, social resilience, as defined in more detail below, refers to a social system’s ability to draw from its individual,

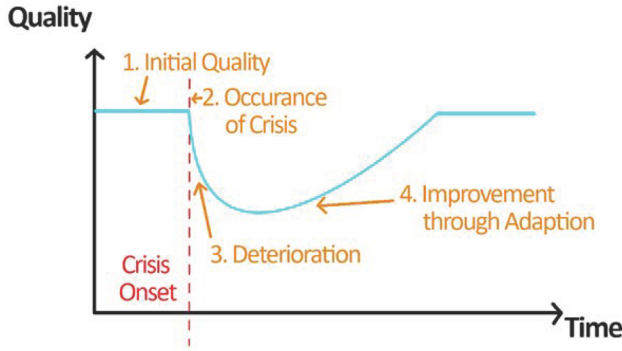
collective, and institutional capacities to adaptively respond to a crisis, such as the recent pandemic. In analyzing the religious institutions' social media communication during this crisis, their impact on the collective cultivation of shared meaning for their social subsystem can be observed. This allows to gain valuable insights for society's resilient navigation of future crises.

This article is Part 2 of a two-part project researching digital religious communication as a potential factor for social resilience. Part 1 was published in a previous issue of this journal and introduces the theoretical model of resilience used to quantify "community narratives" on Twitter for analysis. Due to the limited scope of this paper, we take only a first step in the direction of answering the RQs. After summarizing the concept of resilience from Part 1 that is then used in the empirical test case presented here, the methodology, dataset, and results are described. Finally, the results are discussed with respect to the resilience of (RQ 1) and the resilient self-understandings facilitated by (RQ 2) the ecumenical and humanitarian organizations under consideration.

## The concept of social resilience

The investigation of digital communications of religious organizations on Twitter – focusing on the resilience of groups as *social systems*, and more particularly, as *systems of communication* – required a quantifiable model of social resilience. However, the literature on social resilience has not yet identified a sufficiently quantifiable model for assessing the resilience of groups (Koliou et al. 20). To address this issue, in a prior and extensive phase of the presented study's project, we created a quantifiable resilience model fit for utilizing communication artifacts for resilience assessment by drawing on social-scientific understandings of the term and supplementing them with insights from the natural-scientific models. This was done under the hypothetical assumption that an integration of quantitative methodologies might be possible at those points where there are fundamental agreements between the social- and natural-scientific understandings of (social) resilience, including, e.g., the identification of time sequences and the quantifiability of the social objects being analyzed. While the model has been discussed in detail in a previous article in this journal, the following section will provide a summary of the model's features as far as they will guide the evaluation of the measured resilience values.

In a first step, four necessary conditions indicating the development of a social system's quality  $Q(t)$  as resilience-relevant have to be identifiable: 1. identification of a starting quality of the system; 2. development of that quality over the crisis period; 3. deterioration of the quality; 4. adaptations for recovery (see [Figure 1](#)).



**Figure 1.** Development of a social system’s quality  $Q(t)$  depicting the four necessary condition.

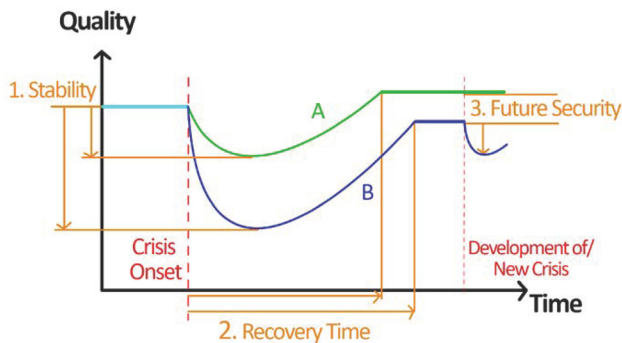
If all necessary conditions are met, social resilience during the given crisis may thus be described as a quantitative resilience value  $R(t)$  defined as:

$$R(t) = \int_{t_0}^{t_1} Q(t) dt$$

where  $Q(t)$  corresponds to the evolution of the system’s quality over the period  $t \in [t_0, t_1]$ . Conceptualizing social resilience this way allows to look at different instances  $Q_i(t)$  of the communication system to calculate the corresponding resilience values  $R_i(t)$ . In this paper, two instances will be discussed as specifications for RQ1. First, the “communication volume”  $Q_C$  – that is, the amount of communication addressing the pandemic over time – serves as an indicator of organizations’ ability to stay on or return to certain topics. This makes it possible to calculate an aspect of “communication resilience”  $R_C(t)$ . Second, the “sentiment of communication”  $Q_S$  is analyzed as an indicator of a potential shift toward more negative communication due to the impact of the pandemic. This would make possible the calculation of the “sentiment resilience”  $R_S(t)$ .

The resilience values calculated *via* this model are not meaningful on their own, but only relative to other resilience values of the same normalization. This comparability can be established between two datasets collected for this study, for each of which resilience values  $R_i(t)$  were determined. For this reason, not only the communication of the groups selected is analyzed, but this is set in comparison with a data set constructed from a representative sampling of Twitter communication during the same time period.

From a social-scientific qualitative perspective, different aspects may be decisive for the interpretation of the resilience values measured. Potential points of focus include: 1. the greatest possible “stability” at the moment of the crisis; 2. the shortest possible “recovery time” for the quality; 3. “future security” in the event of a renewed crisis or a worsening of the



**Figure 2.** Illustration of the three social-scientific evaluation aspects “stability”, “recovery time” and “future security” based on two developments of a system’s quality  $Q(t)$

current crisis. In [Figure 2](#) below, showing two exemplary developments of a system’s quality  $Q(t)$  named A and B, development A would be more resilient than development B according to the measured resilience value  $R(t)$  and each of the three evaluation criteria mentioned.

## Methods

### *Dataset creation*

To investigate the RQs, a quantitatively robust dataset of tweets from official religious organizations was created. First, relevant Twitter user accounts (TUA) were identified, consisting of ecumenical, interfaith, and humanitarian faith-based organizations (criteria for inclusion in the dataset required that groups had: an ecumenical or religious humanitarian profile; a minimum of 1000 followers; a minimum of 10 tweets since 01/01/2020; been active on Twitter before 01/01/2019). This resulted in a database of 126 accounts included. Based on 105 of the 126 TUA (83.3%) providing location information in their user profiles, the global geographic distribution of the TUA is visualized in [Figure 3](#). While a clear dominance of the large English-speaking countries (the United States, the United Kingdom, and Canada) is noticeable, the overall TUA distribution is representative of the English-speaking Twitter community (Statista):

Subsequently, all tweets of the identified TUA posted between 01/01/2019 and 09/13/2021 were collected in a database *via* the “Twitter API v2”. Tweets from the pre-pandemic year 2019 were included to compare Twitter activity before and during the pandemic. After data shaping (Fortino 34) and data cleansing (Döring and Bortz 585), the resulting research dataset (“research dataset”, RD) consisted of 238,923 tweets.

In order to determine possible differences between the RD and the general Twitter activity during the study period, a second dataset (Twitter “average dataset”, AD) with random English-language tweets was generated,



**Figure 3.** Global distribution of TUA of the research dataset. Each marker corresponds to one of the TUA. The radius of the blue circles is linearly scaled with the number of TUA in the respective country.

containing a total of 919,529 English-language tweets, approximately equally distributed in time over the study period.

For both datasets, a repository set up *via* a university cloud server in Germany, “Sciebo”, served as the storage location. Sciebo ensures access-restricted and secure storage of sensitive data. The data handling was based on Art. 89 DS-GVO in conjunction with §17 DSG NRW. In addition, the “Social Media Ethics Framework” by Townsend and Wallace was used to ensure ethical research practice (Townsend and Wallace). All program code written for data collection and analysis is available on GitHub ([https://github.com/J-Froeh/Twitter\\_Religion-Resilience](https://github.com/J-Froeh/Twitter_Religion-Resilience)). In addition, the datasets created can be (according to Twitter’s developer policy) requested from the authors of the study.

### **Evaluation methodology**

To investigate the development of COVID-19-related (“COV.-rel.”) communication of the TUA indicating communication resilience (RQ1.1), the RD was assessed for a significant shift in the communication contents to include COV.-rel. semantics. A shift was considered with a minimum change in the standard deviation of  $|\sigma| > 3$ . To identify COV.-rel. semantics, the list of terms published in the “Coronavirus (COVID-19) Tweets Dataset” (Lamsal) was used. Lastly, the resilience component  $R_C(t) = \int_{t_0}^{t_1} Q_C(t) dt$  was calculated for the RD and the SD.

To investigate the change in sentiment indicating sentiment resilience (RQ1.2), the sentiment valence of the tweets was determined using the “VADER Sentiment Analysis” tool. This was standardized and examined for significant changes of  $|\sigma| > 3$ . In this case, while providing unexpected insights into the groups’ Twitter communication, the sentiment valence during the pandemic did not meet the necessary conditions to signify a resilience-relevant progression.

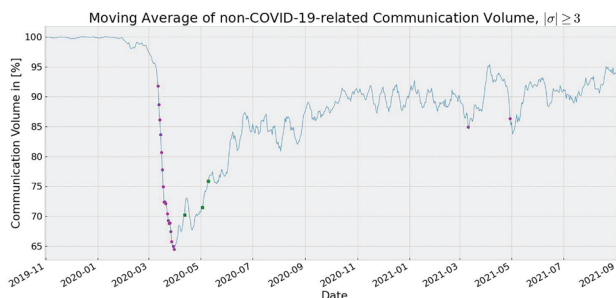
To answer how resilience-effective religious semantics might indicate a connection between religious self-understanding and group resilience (RQ2), a Latent Dirichlet Allocation (LDA) topic analysis was performed for the RD. In order to conduct the analysis, the RD was first narrowed to COV.-rel. tweets. The prepared dataset was then passed to the gensim module “ldamulti-core” (Řehůřek), which was used to create the topic model. This was subjected to hyperparameter fitting for optimization as done by Amin Azad (Azad). Finally, to answer RQ2, the topic model was (i) analyzed for semantics constitutive of the topic and (ii) checked for the occurrence of religious semantics.

## Results

### Research question 1.1

Examination of the RD for COV.-rel. communications revealed that approximately 7.8% (18,846 of 238,923) of tweets were directly related to the pandemic. A graphical time series analysis subsequently conducted to determine the period in which pandemic-related terms were included can be seen in Figure 4, showing the reduction of non-COV.-rel. communication during the pandemic. Here, it can be seen that an initial thematization of the pandemic began at the end of January 2020 and increased exponentially to a global maximum value in March 2020.

Calculating the significance of this shift in communication, in the period from March 12-31, 2020, a total of 18 days could be detected on each of which, in direct comparison to the previous day, a significant reduction of  $\sigma \leq -3$  non-COV.-rel. communication took place. For better clarity, the significant points are marked as magenta circles in Figure 4. The maximum reduction of the non-COV.-rel. communication volume was observed to have occurred on April 07, 2020, when it dropped to approximately 59.1% of the total communication. Relating these observations back to the elements characterizing a situation of potential resilience, described above,



**Figure 4.** Simple moving average (7 days) of non-COV.-rel. communication volume. Magenta circles for  $\sigma \leq -3$  and green squares for  $\sigma \geq 3$ .

a significant deterioration of communication volume addressing pre-pandemic topics is evident.

Following the detected impact on communication volume, the RD was then analyzed for a significant recovery of the non-COV.-rel. communication. Time series analysis of the trend-adjusted standardized dataset revealed a significant increase on April 12, 2020, and March 03 and 05, 2020, compared to the previous day (see [Figure 4](#), green squares). In addition, an overall positive trend for the non-COV.-rel. communication volume could be identified from the beginning of April 2020, which persisted for several months. In other words, the groups tweeted less and less about the pandemic, showing themselves thus to be recovering from the impact of the pandemic on their communication.

Finally, the communicative resilience component  $R_C(t)$  was calculated. Using the boundaries of  $t_0$  on Jan. 15, 2020, and  $t_1$  on Sept. 12, 2021, the value for the entire RD was  $R_C \approx 531,5$ , which corresponds to the area under the curve of the non-COV.-rel. communication share of total communication.

### **Research question 1.2**

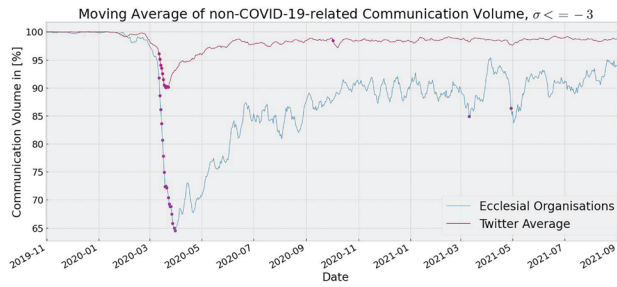
When the RD was examined for a significant deterioration in sentiment valence during the crisis onset, no significant decrease was found. Furthermore, not only did the overall sentiment valence  $S$  not show a significant shift, but also the sentiment valence difference  $\Delta S$  between non-COV.-rel. tweets and COV.-rel. tweets turned out to be only minor. For non-COV.-rel. communication, an average sentiment valence of  $S_{nc} \approx 0,387$  was found, while the average sentiment valence of COV.-rel. communication was  $S_c \approx 0,293$ , so that  $\Delta S = -0,094$ .

Since no significant decrease in sentiment valence was found during the period of crisis onset, and therefore not all necessary criteria were met according to the theory for finding a resilience-relevant crisis progression, the sentiment resilience component  $RS(t)$  of the RD will not be analyzed further for its own sake but only in comparison to the sentiment of the AD, as described below.

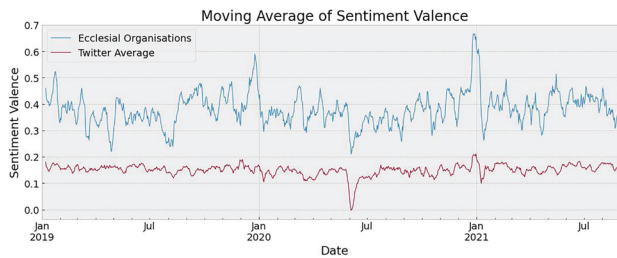
### **Research question 1 – results of the random dataset**

Although the AD was examined analogously to the RD, due to the limited length of this paper, only the results relevant to the discussion are presented. Three points of interest emerge from a comparison of the datasets:

First, the evaluation for RQ1.1 revealed that the non-COV.-rel. communication share differs significantly between the two datasets. While the communication share in the RD was reduced to as low as 59.1%, only a



**Figure 5.** Ratio of non-COV.-rel. and COV.-rel. tweets during the crisis period in the RD (top) and the AD (bottom).



**Figure 6.** 1W SMA of the sentiment valence for both datasets (ecclesial organizations – blue; Twitter average – red).

**Table 1.** Sentiment valence of the RD and AD as well as their difference.

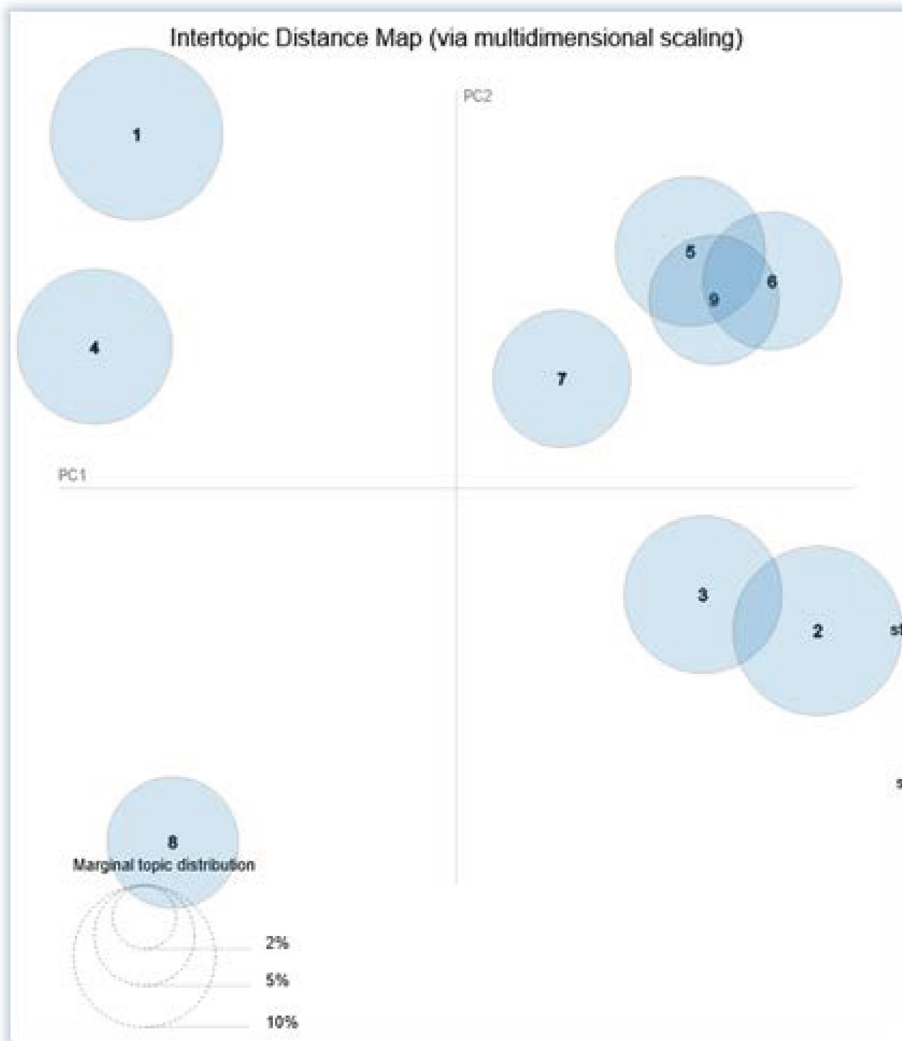
Sentiment value	RD	AD	Difference
$S_{nc}$	0.387	0.151	0.236
$S_C$	0.294	0.01	0.283
$\Delta S$	-0.094	-0.141	0.047

maximum reduction to 89.3% of the total communication could be found in the AD, with an otherwise similar development of the communication shares. In other words, the communications collected for the AD showed significantly less attention to the pandemic than the RD, as shown in Figure 5.

Second, following directly from the previous observation, since the calculated resilience component  $R_C(t)$  is directly correlated with the proportion of non-COV.-rel. communication, the calculated resilience values of the RD and the AD also differ. Whereas the RD had an average resilience value of  $R_C \approx 531,5$ , the resilience value of the AD was  $R_{C\_random} \approx 594,5$ , which is significantly higher.

A third striking feature is that a significant difference in the studied sentiment valence was found, as shown in Figure 6. The direct comparison of the values is shown in Table 1.

It can be seen immediately that the sentiment valence in the RD is much higher (i.e., more positive) than in the AD. Even the sentiment



**Figure 7.** Intertopic distance map visualizing the topic clusters resulting from the LDA topic modeling.

valence of COV.-rel. communication  $\mathcal{S}_C$  in the RD is still almost two times higher the non-COV.-rel. sentiment valence  $\mathcal{S}_{nC}$  of the AD.

### **Research question 2**

For the investigation of RQ2, the RD was limited to tweets that are related to the pandemic (18,846 of 238,923 tweets, or 7.8%). The generation and hyperparameter fitting of the LDA topic model led to an improvement of coherence value of  $C_{start} \approx 0,2268$  to  $C_{max} \approx 0,368$  for the final model.

The topic modeling analysis clustered the tweets into a total of nine topics. These are shown in [Figure 7](#) using circles on an “Intertopic Distance Map”.

**Table 2.** The 10 most significant terms per topic.

ID	Most significant terms
1	vaccine (95%), <b>faith (67%), church (43%)</b> , join (46%), leader (50%), community (22%), webinar (81%), global (35%), register (82%), time (18%)
2	child (73%), family (43%), help (24%), support (21%), world (18%), work (27%), food (4%), protect (50%), year (44%), community (16%)
3	people (29%), million (55%), world (22%), <b>pray (35%)</b> , help (25%), today (31%), report (56%), support (19%), read (27%), child (17%)
4	<b>church (30%), prayer (68%), christian (95%), faith (26%), wcc (28%)</b> , read (29%), community (15%), leader (33%), world (14%), impact (24%)
5	health (61%), support (27%), worker (48%), community (20%), world (18%), vulnerable (33%), people (13%), response (24%), care (40%), government (41%)
6	help (22%), need (24%), congress (94%), people (13%), support (11%), time (11%), include (33%), pass (89%), family (11%), country (18%)
7	community (11%), crisis (24%), people (10%), new (21%), face (21%), country (19%), case (48%), work (11%), government (27%), family (8%)
8	<b>pray (61%), god (84%), wcc (42%)</b> , time (21%), world (12%), <b>prayer (30%)</b> , love (69%), today (14%), new (19%), life (22%)
9	food (40%), need (19%), family (16%), hunger (50%), help (13%), join (15%), response (13%), world (7%), today (10%), people (6%)

Sorted by absolute term frequency within the topic. Included next to each term is the percentage showing how often the term occurs within the topic relative to the total number of occurrences of the term in the LDA dataset (rounded to a full number). Religious terms are marked in bold.

The size of the circles indicates the percentage of tweets that belong to the respective topic. Additionally, the distance between the individual circles corresponds to the statistical proximity between the topics. A considerable distance, such as between topic 1 and topic 2, means that the terms constitutive for the topic only occur together in tweets in a small number of cases. Conversely, a small distance or overlap between topics – as in the case of topics 5, 6, and 9 – means that the constitutive terms frequently occur together in a tweet. A tweet at the intersection of the three topics 5, 6 and 9 can be assigned equally to all three topics.

For each topic, the 10 most significant terms were identified. These have the greatest significance statistically within the topics and are constitutive for the respective topic. For these reasons, they represent a meaningful choice when aiming to gain an impression of the communication process. Table 2 shows those terms for each topic. Included next to each term is the percentage showing how often the term occurs within the topic relative to the total number of occurrences of the term in the LDA dataset. Additionally, terms that can be identified as having a religious quality are marked in red.

In total, four of the nine topics in the final topic model have terms with unambiguously religious semantic contents. These include three topics – topics 1, 4, and 8 – on the left side of the Intertopic Distance Map (see Figure 7) and contain multiple religion-related semantics each. However, only topic 3 both includes the term “pray-”, as a religion-related semantic, and also stands in relative proximity to the other five topics in the dataset.

## Discussion

In the following, we now discuss the results of the investigation of the datasets with a special focus on understanding the potential significance of digital religious communication as a social resilience factor. For both research questions, this begins with a framing of the results against the theoretical background. Finally, the limitations of the study are discussed at the end of the section.

### Research question 1

#### *Discussion of the results in relation to the theoretical model*

RQ1 deals with digital religious communication as an expression of the social resilience of the TUA studied rendered and read as communicative resilience  $R_C(t)$  and sentiment resilience  $R_S(t)$ .

Regarding  $R_C(t)$ , the four necessary conditions for calculating a meaningful resilience value described above are satisfied in the RD. There was (1.) a stable baseline level of non-COV.-rel. communication (2.) that experienced a significant drop during the period of pandemic onset. Importantly, with regard to the relevance of digital religious communication for social resilience, this drop does not necessarily correspond to a worsening of the situation (see below). However, (3.) following Spradley and Spradley (T. Spradley and E. Spradley 70), that drop does constitute a pandemic-related functional decline and as such clearly marks a resilience-relevant starting point in the dataset. Finally, (4.) the results show a recovery of the non-COV.-rel. communication share as the pandemic progresses. Thus, all necessary conditions are met, making the quantitative determination of a resilience value  $R_C(t)$  for the communication evolution  $Q_C(t)$  plausible.

Following the establishment of the necessary conditions, the quantitative analysis of RQ1 offers the possibility of classifying the results on the basis of the three resilience evaluation aspects of “stability”, “recovery time” and “future security”.

It is striking that the comparison between the RD and the AD reveals that “stability” and “recovery time” are much more pronounced in the AD. As can be seen in [Figure 5](#), the non-COV.-rel. communication of the religious TUA shows a much larger dip. Similarly, the recovery of the communication percentage sets in later, and COV.-rel. communication remains at about 10% – which is equivalent to the maximum value the AD reached, and even then, only briefly. In line with the calculated resilience values of the two datasets of  $R_C \approx 531,5$  und  $R_{C\_random} \approx 594,5$ , this means that the religious TUA studied experienced the crisis in a significantly less resilient manner compared to general communication *via* Twitter, at least with respect to these two evaluation aspects. On the other

hand, the sentiment valence analysis showed the sentiment of the religious TUA's communication to be more stable compared to the AD.

Regarding the third potential aspect of “future security”, both datasets perform equivalently. Although the pandemic worsened substantially in terms of the number of cases in several waves during the period studied, neither dataset shows any response in communication volume (and sentiment valence) that would be remotely comparable to that at the onset of the crisis. This fact suggests that social resilience, like individual resilience (Richter and Blank 71), is a dynamic process that develops and evolves as social groups experience crises. If the comparability between individual and social resilience is valid in this regard, then social resilience is also a “crisis phenomenon par excellence” (Richter and Korsch 12), analogous to individual resilience, of which Eberhard Hauschildt (Hauschildt 102) has written: “[i]n the crisis itself, and specifically in its current personal communicative experiences, [...] resilience [is] formed”. The same insight can be applied to larger frames of communication, such as social media. The narratives and religious beliefs negotiated there, which in turn can serve as a resilience resource for the constituents of the group, may well be regarded as a form of crisis care, as in pastoral one-on-one conversation at the individual level. This presupposes that digital religious communication as identifiable and plottable among communicators, networks, and narratives can be measured, understood and theologically reflected back to religious communicators for their digital presence.

### ***Ambivalence of the concept of resilience used***

As noted above, the collapse of non-COV.-rel. communication of religious TUA does not necessarily correspond to a “worsening” of anything, whether of the group or even of its communication. The study found that the calculated resilience values  $R_{C_i}$  of almost all TUA of the RD are significantly lower than the value  $R_{C\_random}$  of the AD. Although this result remains significant overall, such a finding might be expected of those TUA whose organizations have a diaconal/humanitarian focus. Consistent with the goal of such organizations to respond to current humanitarian emergencies such as the COVID-19 pandemic, an increased share of COV.-rel. communications in the dataset is to be expected. This, in turn, directly causes a decrease in the resilience value  $R_C(t)$  for the corresponding TUA.

This circumstance illustrates the aforementioned ambivalence of the concept of resilience obtained from the literature for this study. While from the perspective of the concept of resilience proposed by Spradley and Spradley (T. Spradley and E. Spradley 70), a decrease in non-COV.-rel. communication represents a decrease in social resilience and thus

should be evaluated as a worsening of the condition, the interpretation of the findings sheds different light on this evaluation: Reaching maximum resilience through minimal reference to the pandemic – and therefore potentially minimal support – is precisely not to be evaluated as positive.

Thus, rather than lack of affectedness or stability, *recovery* in relation to *degree of affectedness over time* would seem to be the more relevant measures of social resilience of digital religious communications.

### Research question 2

RQ2 deals with digital religious communication as an expression of resilience-relevant self-understanding. We took a first step in this direction by analyzing the religious players' communication regarding their most significant (religious) topics. The result of our investigation shows that their pandemic-related communications can be divided into nine topic fields. Of these, four of the nine fields feature explicitly religious terms, while their communications on five of the nine topics use primarily “non-religious” semantics.

Of the four religious topic fields, topics 1 and 4, located in the upper left of the “Intertopic Distance Map” in Figure 7, show a relatively high degree of similarity. Together, they unite almost all tweets in which the terms “faith”, “church,” and “Christian” appear (see Table 2). Comparing the most significant terms of the two topics, both topics seem to focus primarily on the impact of the pandemic on Christian communities. An organizational leadership perspective is particularly present here, as can be seen by the frequent occurrence of the term “leader”. The main difference between the two topics seems to be that topic 1 focuses on dealing with the vaccination options introduced during the pandemic, while topic 4 generally addresses training for church leaders on how to deal with the pandemic situation. This is illustrated nicely by the two sample tweets in Table 3. Sample tweets were selected from the dataset by containing (i) the most significant term of the topic and (ii) 4 other terms among the 10 most significant terms:

Topic 8, which is also predominantly characterized by religious semantics, is located at a relatively large distance from all other topics on the

**Table 3.** Sample tweets (user mentions <handle> and URL <URL > are anonymized).

ID	Sample tweet
1	Looking forward to this webinar tonight! If you're in church leadership and have questions about the vaccine and engaging your church - do join us, 5 pm. Hosted by @<handle>. @<handle> in partnership with @<handle>. \n\nTo Register: <URL>
4	In last month's Lambeth Conference Bishops' Conversations, Bishops from around the world shared how the Pandemic was impacting their churches and communities. \n\nThe next round of Bishops' Conversations start next week. \n\nRead about it here. <URL>

**Table 4.** Sample tweets of topics 3 and 4 (user mentions <handle> and URL <URL> are anonymized).

Topic	Sample tweet
3	Today we pray for those experiencing hunger. More than 820 million people around the world are hungry, and COVID-19 and the lockdowns are disrupting supply chains. We pray for your provision and for immediate action to prevent a global food crisis. #stayandpray<URL>
4	RT @<handle>: DAY 3 of the Global Week of Prayer. Today, we pray for wisdom for world leaders. Who can you be praying for in your own community today? \n\nDownload prayer resources for your family, church or community at<URL>   #COVID19 <URL>

“Interdistance Topic Map” (see [Figure 7](#)). This is probably due to the fact that it contains almost all tweets with the terms “god” and “lord” (see [Table 2](#)). Additionally, the terms “prayer” and “pray” are central to the topic. However, what becomes evident here is that the religious players analyzed consistently made an explicit reference to God when it came to the topic of prayer. It is striking that the nominal form “prayer” occurs almost exclusively in topics 4 and 8, while the verb form “pray” occurs almost exclusively in topics 3 and 8. A plausible explanation for this could be that different forms are used depending on the congregation-internal or congregation-external context. Tweets of topic group 4, which are predominantly focused on the congregational situation during the pandemic, could thus be characterized by a different language than the tweets of topic group 3, which is in close proximity to the five topics without religious semantics. This explanation also seems plausible against the background of the example tweets in [Table 4](#).

The aforementioned topic 3 as well as topics 2, 5, 6, 7 and 9 are, statistically speaking, relatively close together and exactly opposite to the three religiously connoted topics 1, 4 and 8 (see [Figure 7](#)). In all six topics, the terms “support”, “worker”, “community”, “vulnerable”, “people”, “family”, “help” and “protect” occur frequently (see [Table 2](#)). This shows a high focus of the tweets belonging to the mentioned topics on emergencies caused by the pandemic and an effort to address them (see the terms “support”, “help”, “protect”). Content-wise, there is significant proximity here to the already mentioned topic of “diaconia”, which, however, does not seem to be limited to the generally diaconia-oriented TUA of the RD. Rather, with six of the nine themes, a potentially diaconal aspect predominates generally, suggesting that also non-diaconic oriented religious players started to address emergencies caused by the pandemic with its onset (Abbing 644; vol. 8). This result is particularly interesting as insofar the same significant turn toward diaconal engagement has been observed for US-American churches (Thumma and Norton 1).

Within the non-religious oriented topics, the topics 5, 6 and 9 are so close to each other that there is significant overlap between them (see [Figure 7](#)). This means that there is presumably one set of topics with

**Table 5.** Sample tweets from topics 5, 6, and 9 (user mentions <handle> and URL <URL> are anonymized).

Topic	Sample tweet
5	RT @<handle>: .@<handle> asks Appropriations Cmtees to swiftly provide support for key needed global & humanitarian programs as "pandemic is outpacing the global response and threatens to collapse health systems and imperil vulnerable people worldwide." <URL> #ELCACHurchTogether
6	There is no better time to pass the #HealthyFamiliesAct than the present. COVID-19 has devastated communities -- impacting women and people of color the hardest. The Healthy Families Act gives us a fresh start and to help bring economic stability back to these communities. <URL>
9	RT @<handle>: A8: The charitable food system is on the front lines supporting people facing #hunger in the wake of #COVID19, but they alone can't #EndHunger. Charities make up only 5% of food assistance in the US. It's the government's job ensure that #SNAP helps all who need it. \n\n#FoodFri

three focal points in the discussion here, rather than three distinct topics. Tweets of topic group 5 seem to be mainly focused on the situation of medical care workers, as the three most frequent terms of the group “health”, “support” and “worker” suggest. Tweets of topic group 6 possess the peculiarity that almost all term usages of “congress” and “pass” are included. This suggests topic 6 deals with legislation on the pandemic situation. For tweets of topic 9, it is characteristic that a substantial proportion of the term usages of “food” and “hunger” are assigned to the topic group. All three of the overlapping themes taken together appear to be concerned with the situation of caregivers and families during the pandemic and how this situation can be improved through legislation. Both the intersection between the topics and the individual share in each case are shown in the corresponding sample tweets in [Table 5](#):

Taking all topics together, another circumstance stands out: In none of the topics could terms or semantics be detected that refer to the topic of death. In view of the high sentiment valence of religious communication identified in the context of RQ1, it would be natural to expect successful handling of the crisis on an emotional level. Also, in line with Tallapragada’s (Tallapragada 79) analysis of the topic’s importance for the formation of resilience, we expected that strategies for dealing with the topic of death would play an essential role in social communications facilitating individual and social resilience. Moreover, there is a long and rich tradition of dealing with the topic of death both theologically and pastorally in the Christian faith, and one might expect these reflections to figure into resilience-promoting communications (Richter 33). Therefore, the complete omission of this topic in the public communication of large religious players about a social challenge in which death has played a very significant role in the public imagination and, further, combined with the high sentiment valence of these players’ communications is conspicuous. This requires for further research on topics that appear in the dataset.

## **Limitations**

The results of our research thus far are to be understood against the background of its limitations as a proof-of-concept study. A first limitation is the truncated size of the datasets. In particular, the total size of the RD with less than 250,000 tweets after cleaning, of which less than 20,000 tweets with COVID-19 reference could be used in the context of RQ2, limits the statistical representativeness of the study results. The same applies in particular to all the sample tweets cited in this section. The samples provided serve solely to illustrate the results and are not to be understood as evidence or justification, since their representativeness can only be assumed on the basis of the selection criteria described above.

Furthermore, as the present study is a non-experimental study, only correlations can be shown, but in no way can causalities be proven (Döring and Bortz 102). The discussion of the results based on this is therefore interpretive in nature and cannot claim final validity.

Finally, with this report, we do not see ourselves as offering a complete analysis of the results obtained. In particular, the interpretive possibilities presented in this section serve to highlight the potential of research on digital communication spaces using data-scientific methods in the study of religion.

## **Conclusion**

The article presented the quantitative measurement of the social resilience of 126 ecclesial or diaconal organizations during the first 1.5 years of the COVID-19 pandemic through "digital religious communication" on Twitter. It was found that the pandemic strongly impacted these organizations' digital communication. While communication sentiment remained unchanged, up to 40.9% of all communication was pandemic-related - four times as much as the average communication on Twitter. Thereby, the ecclesial organizations showed comparably low social resilience by standards of the framework utilized for measurement. This, in turn, raised the question of whether maximum resilience is desirable if it (potentially) correlates with less crisis thematization and, therefore, less support from diaconal organizations.

In a second step, the organizations' communication was then analyzed for religious semantics and narratives used to address the pandemic, thereby deepening the understanding of the connection between "digital religious communication" and the facilitation of social resilience in the face of crisis. In doing so, a clear distinction between religious and non-religious communication in topic and language could be observed, bridged only by the semantic of "pray(er)". Further, a strong focus on humanitarian

aspects in connection with the pandemic has been identified, signaling a perspectival shift in this direction during the pandemic. Overall, practical aid turned out to be the primary avenue of these organizations for facilitating social resilience rather than more theoretically or pastoral-care-oriented thematization of pandemic-related issues such as mortality salience.

As noted earlier in this article, the presented study is a proof-of-concept study. Therefore, the analyzed research questions are not a comprehensive analysis of the organizations' communication impact on societal resilience. However, in focusing on select aspects relevant to social resilience, the applicability of the utilized resilience framework has been shown. On the one hand, this now invites further research on the organization's communication to advance our understanding of how they facilitated social resilience during the pandemic and how successful strategies might be included in policymaking. On the other hand, the study sheds light on the analyzed communication artifacts' importance for both theological and religious studies research as well as information science.

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