



## Data Article

# Triggering cognitive dissonance with textual information and images: Data from three experiments with meat-eaters



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## ABSTRACT

This article presents data from three experiments in which we triggered and measured cognitive dissonance in meat-eaters. Cognitive dissonance is a well-established concept in the social psychology literature; however, empirical measures are scarce. In all datasets, we used textual information and/or images related to meat consumption as means to trigger cognitive dissonance. Cognitive dissonance data was collected in Study 1 with a Likert scale, whereas Study 2 and 3 used a Semantic Bipolar scale. Each experiment was programmed with Qualtrics and consisted of four conditions. Data was collected online; Study 1 utilized social media to recruit participants while Study 2 and 3 were hosted on Prolific. All datasets contain items on participants' socio-demographic background, liking of different food products, cognitive dissonance, and a measure of meat avoidance. The data can be used to analyze the effect of information provision on cognitive dissonance and meat avoidance. Moreover, the relationship between socio-demographic variables and cognitive dissonance,

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as well as other exploratory purposes regarding meat avoidance can be explored. Furthermore, researchers can use the data to investigate differences between Likert scales and Semantic Bipolar scales. This data is related to the paper *Can images and textual information lead to meat avoidance? The mediating role of cognitive dissonance* [1].

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## Specifications Table

Subject	Social and Personality Psychology
Specific subject area	The effect of information provision in the form of texts and images on cognitive dissonance and meat avoidance
Type of data	Excel files
How the data were acquired	Online experimental study with survey tool Qualtrics. Participants for Study 1 were recruited through social media (e.g., Facebook) and the platform Survey Circle. Study 2 and Study 3 were launched on Prolific.
Data format	Cleaned raw data, partially analyzed
Description of data collection	The datasets originate from three distinct online experiments, all following a $2 \times 2$ between-subjects design with the experimental factors image (conflict vs control) and textual information (conflict vs control). Study 1 ( $n = 280$ ) uses a Likert scale to measure cognitive dissonance in relation to images and texts about meat and Study 2 ( $n = 190$ ) uses a semantic bipolar scale. Study 3 ( $n = 379$ ) uses a bipolar scale and operationalizes a new measure of meat-related cognitive dissonance. In all studies, we collected a measure of meat avoidance with a hypothetical food choice task and included a measure of food liking. We excluded participants who follow a vegetarian or vegan diet and participants who never consume pork.
Data source location	Institution: University of Bonn City/Town/Region: Bonn Country: Germany
Data accessibility	Repository name: Open Science Framework (OSF) Data identification number: <a href="https://osf.io/rj5yp/">10.17605/OSF.IO/RJ5YP</a> [2] Direct URL to data: <a href="https://osf.io/rj5yp/">https://osf.io/rj5yp/</a>
Related research article	The results from Study 3 are published here: N. Weingarten, C.J. Lagerkvist, 2023. Can images and textual information lead to meat avoidance? The mediating role of cognitive dissonance. <i>Food Quality and Preference</i> . 104, 104747. <a href="https://doi.org/10.1016/j.foodqual.2022.104747">10.1016/j.foodqual.2022.104747</a> .

## Value of the Data

- The datasets provide information about different empirical measures of cognitive dissonance, operationalized with a Likert Scale (Study 1) compared to a Semantic Bipolar scale (Studies 2 and 3).
- Furthermore, the data allows researchers to estimate how cognitive dissonance mediates the effect of information provision on meat avoidance in meat-eaters, and to control for additional covariates in the mediation analysis.
- Researchers can benefit from this data when they want to use a measure of cognitive dissonance and investigate differences between a Likert scale and Semantic Bipolar scale.
- Data can be used to further analyze the relationship between socio-demographic variables, food liking, cognitive dissonance, and meat avoidance, for example according to the meat-related cognitive dissonance framework by Rothgerber [3].

## 1. Objective

We conducted three experimental studies to investigate the effect of information provision on meat avoidance behaviour. The related research article [1] presents the results of the main study (Study 3). In addition, we collected two prior datasets with a different conceptualization of the cognitive dissonance measure. Our data contributes to the academic literature in two ways: first, we show that by leaning on the theory of cognitive dissonance, information provision can contribute to the transition towards a plant-based diet, which has beneficial effects on consumers' health, environmental sustainability, and animal welfare [4]. Second, we present a modified measure of cognitive dissonance. Although this construct is already long established in social psychology [5], empirical measures related to food consumer research are scarce [6].

## 2. Data Description

The datasets originate from three experimental studies that were carried out between 2020-2021 with meat-eaters. The experimental design, survey, and material from each experiment are provided on OSF, along with the data files [3]. All three datasets contain variables regarding participants' assignment to different experimental conditions, socio-demographic background, food liking, cognitive dissonance, and meat avoidance (see Table 1). We provide a descriptive summary of key variables in Table 2.

**Table 1**

Short description of key variables in the datasets for Study 1-3.

Study 1 <i>n</i> = 280	Study 2 <i>n</i> = 190	Study 3 <i>n</i> = 379	Description
Condition	Condition	Condition	Random assignment to one of four conditions
Gender	Gender	Gender	Gender of participant
Age	Age	Age	Age of participant
Diet	Diet	Diet	Dietary pattern of participant
Pork	Pork	Pork	Pork consumption pattern of participant
Meat_Like	Meat_Like	Meat_Like	Score of expected meat item liking
Veg_Like	Veg_Like	Veg_Like	Score of expected veggie item liking
ImageCD	ImageCD	/	Score of image-related cognitive dissonance
TextCD	TextCD	/	Score of text-related cognitive dissonance
/	/	MeatCD	Score of meat-related cognitive dissonance
Choice	Choice	Choice	Selected option in the food choice task

**Table 2**

Descriptive summary of main variables in Study 1-3.

	Study 1 <i>n</i> = 280	Study 2 <i>n</i> = 190	Study 3 <i>n</i> = 379
Condition	Control = 76 Conflict-Text = 63 Conflict-Image = 72 Combined = 69	Control = 49 Conflict-Text = 49 Conflict-Image = 45 Combined = 47	Control = 94 Conflict-Text = 90 Conflict-Image = 95 Combined = 100
Gender	Men = 114 Women = 165 Non-binary = 1	Men = 108 Women = 81 Non-binary = 1	Men = 225 Women = 152 Non-binary = 2
Age	<i>M</i> = 24.32 <i>SD</i> = 4.27	<i>M</i> = 26.99 <i>SD</i> = 9.64	<i>M</i> = 27.77 <i>SD</i> = 8.58

(continued on next page)

**Table 2** (continued)

	Study 1 <i>n</i> = 280	Study 2 <i>n</i> = 190	Study 3 <i>n</i> = 379
Diet	Omnivorous =112 Flexitarian =166 Other =2	Omnivorous = 150 Flexitarian = 39 Other = 1	Omnivorous = 306 Flexitarian = 73 Other = 0
Pork	Seldom = 103 Sometimes = 108 Often = 51 Almost every day = 18	Seldom = 24 Sometimes = 84 Often = 66 Almost every day = 16	Seldom = 54 Sometimes = 146 Often = 151 Almost every day = 28
Meat_Like	<i>M</i> = 3.93 <i>SD</i> = 1.62	<i>M</i> = 5.40 <i>SD</i> = 1.25	<i>M</i> = 5.33 <i>SD</i> = 1.44
Veg_Like	<i>M</i> = 4.67 <i>SD</i> = 1.65	<i>M</i> = 4.92 <i>SD</i> = 1.57	<i>M</i> = 5.25 <i>SD</i> = 1.47
ImageCD	<i>M</i> = 3.47 <i>SD</i> = 1.65	<i>M</i> = 3.73 <i>SD</i> = 1.37	/
TextCD	<i>M</i> = 3.26 <i>SD</i> = 1.55	<i>M</i> = 3.59 <i>SD</i> = 1.19	/
MeatCD	/	/	<i>M</i> = 2.97 <i>SD</i> = 1.39
Choice	Meat = 57 Veggie = 170 Opt-Out = 53	Meat = 102 Veggie = 68 Opt-Out = 20	Meat = 207 Veggie = 144 Opt-Out = 28

### 3. Experimental Design, Materials and Methods

All experiments followed a  $2 \times 2$  between-subjects design with the experimental factors image (conflict vs control) and text (conflict vs control), but differed in the way cognitive dissonance was triggered and operationalized. We excluded participants who follow a vegetarian or vegan diet and participants who never consume pork. Furthermore, we screened out participants with certain food allergies/ intolerances that would affect the measure of meat-avoidance, for instance, gluten intolerance. In all experiments, we initially obtained consent for participation, followed by a measure of socio-demographic variables such as age, gender, and dietary patterns.

#### 3.1. Study 1

A total of 280 participants were recruited through snowball sampling from social media networks and the platform SurveyCircle for a study on food perception. As an incentive, participants could enter a lottery to win one of three 20€ vouchers.

First, we measured participants' expected food item liking that we later reused in the experiment to measure meat avoidance. Participants rated images of a pre-packed meat as well as a vegetarian sandwich (How do you rate the sandwiches?) on a 7-point Likert scale (1 = I expect to dislike it very much to 7 = I expect to like it very much). Next, we used images to triggered image-related cognitive dissonance in participants. Similar to previous research [7], we showed participants an image of a pig together with ham in the experimental condition, and only ham in the control group. We measured image-related dissonance with three items ('Looking at the image above makes me feel uncomfortable/uneasy/bothered'), that were answered on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) adopted from Elliot and Devine [8]. All items were merged to an average score of image-related cognitive dissonance. Following that, we triggered text-related cognitive dissonance. The experimental conditions received a text that outlined the negative health effects of red and processed meat consumption, whereas the control

groups read about the local university. Similar to image-related cognitive dissonance, we measured text-related cognitive dissonance with three items on a 7-point Likert scale ('Reading the text above makes me feel uncomfortable/uneasy/bothered'). Lastly, we measured participants' meat avoidance with a hypothetical food choice task. Participants could choose between a vegetarian sandwich (tomato-mozzarella), a meat sandwich (ham-cheese), or an opt-out option. To increase the realism of the choice, we asked participants to imagine a situation in which they usually consume sandwiches.

### 3.2. Study 2

We recruited 190 participants from the platform Prolific (<https://www.prolific.co/>), who all received a financial reimbursement in exchange for their participation.

Similar to Study 1, we measured expected liking of two food items for the hypothetical choice task. In this study, we used images of unpacked sandwiches to make the ingredients more visible. Both sandwiches were rated with six items each (e.g. I think this sandwich would taste good) on a 7-point Likert scale (1 = Strongly disagree, 7 = Strongly agree), that were merged into two average scores of expected liking. Next, we used an image to trigger cognitive dissonance. In contrast to Study 1, we combined the pig not with pure ham, but with the ham sandwich that they previously rated in the expected liking measure. To measure image-related cognitive dissonance, we modified the measure from Elliot & Devine [8] to overcome limitations of a Likert scale. Similarly, to the approach from Edenbrandt et al. [9], we added negative-affect items (distressed; undetermined; upset) to the scale that were taken from the positive and negative affect scale (PANAS) [10]. In total, the adapted measure of cognitive dissonance consisted of six items (comfortable-uncomfortable; pleased-bothered; easy-uneasy; relaxed-distressed; determined-undetermined; calm-upset) that were answered on a 7-point Semantic Bipolar scale ('After viewing the image I feel'). Subsequently, we triggered text-related cognitive dissonance with information about the health-meat link and measured it with the modified scale. Lastly, we assessed participants' meat-avoidance with the same choice task as in Study 1.

### 3.3. Study 3

We recruited 379 participants from Prolific who all received a financial compensation in exchange for participation.

First, we assessed liking of the food products with the same instrument described in Study 2. Next, we used the same images and textual information as in Study 2 to trigger participants' meat-related cognitive dissonance with. However, contrary to the previous studies, we did not show images and texts separately, but combined them to a multimodal message. To measure meat-related dissonance, we followed the approach from Study 2 by using a 7-point Semantic Bipolar scale, but modified it, according to the scale of Sweeney et al. [11], to a context-dependent measure of meat-related cognitive dissonance ('How do you feel about your own meat consumption?') with five items (relaxed-distressed; easy-uneasy; comfortable-uncomfortable; pleased-bothered; calm-upset). Finally, participants performed the food choice task similarly to the previous studies.

## Ethics Statements

The Ethics Committee for Clinical Trials on Humans and Epidemiological Research with personal data of the Medical Faculty of the Rheinische Friedrich-Wilhelms-Universität Bonn has declared that no formal ethical approval is required for this research project (file number 099/23).

The experiment was conducted in full accordance with the Declaration of Helsinki and all participants gave informed consent prior to study participation.

## CRedit Author Statement

**Nina Weingarten:** Conceptualization, Methodology Study 1-3, Investigation, Writing – original draft, Writing – review & editing; **Carl-Johan Lagerkvist:** Conceptualization, Methodology Study 2-3, Writing – review & editing. **Manuela Meraner:** Conceptualization, Methodology Study 1, Writing – review & editing; **Monika Hartmann:** Conceptualization, Methodology Study 1, Writing – review & editing.

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## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data Availability

Triggering cognitive dissonance with textual information and images: Data from three experiments with meat-eaters (Original data) (Open Science Foundations).

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## References

- [1] N. Weingarten, C.J. Lagerkvist, Can images and textual information lead to meat avoidance? The mediating role of cognitive dissonance, *Food Qual. Prefer.* 104 (2023) 104747, doi:[10.1016/j.foodqual.2022.104747](https://doi.org/10.1016/j.foodqual.2022.104747).
- [2] N. Weingarten, Triggering cognitive dissonance with textual information and images: data from three experiments with meat-eaters, *Open Sci. Framew.* (2022) <https://osf.io/rj5yp/10.17605/OSF.IO/RJ5YP>.
- [3] H. Rothgerber, Meat-related cognitive dissonance: A conceptual framework for understanding how meat eaters reduce negative arousal from eating animals, *Appetite* 146 (2020) 104511, doi:[10.1016/j.appet.2019.104511](https://doi.org/10.1016/j.appet.2019.104511).
- [4] C. Bonnet, Z. Bouamra-Mechemache, V. Réquillart, N. Treich, Regulating meat consumption to improve health, the environment and animal welfare, *Food Policy* 97 (2020) 101847, doi:[10.1016/j.foodpol.2020.101847](https://doi.org/10.1016/j.foodpol.2020.101847).
- [5] L. Festinger, *A Theory of Cognitive Dissonance*, Stanford University Press, 1962.
- [6] L. Lin-Schilstra, A.R.H. Fischer, Consumer moral dilemma in the choice of animal-friendly meat products, *Sustainability* 12 (2020) 4844, doi:[10.3390/su12124844](https://doi.org/10.3390/su12124844).
- [7] J.R. Kunst, S.M. Hohle, Meat eaters by dissociation: How we present, prepare and talk about meat increases willingness to eat meat by reducing empathy and disgust, *Appetite* 105 (2016) 758–774, doi:[10.1016/j.appet.2016.07.009](https://doi.org/10.1016/j.appet.2016.07.009).
- [8] A.J. Elliot, P.G. Devine, On the motivational nature of cognitive dissonance: dissonance as psychological discomfort, *J. Person. Soc. Psychol.* 67 (1994) 382–394, doi:[10.1037/0022-3514.67.3.382](https://doi.org/10.1037/0022-3514.67.3.382).
- [9] A.K. Edenbrandt, C.J. Lagerkvist, J. Nordström, Interested, indifferent or active information avoiders of carbon labels: cognitive dissonance and ascription of responsibility as motivating factors, *Food Policy* 101 (2021) 102036, doi:[10.1016/j.foodpol.2021.102036](https://doi.org/10.1016/j.foodpol.2021.102036).

- [10] D. Watson, L.A. Clark, A. Tellegen, Development and validation of brief measures of positive and negative affect: the PANAS scales, *J. Personality Soc. Psychol.* 54 (1988) 1063–1070, doi:[10.1037/0022-3514.54.6.1063](https://doi.org/10.1037/0022-3514.54.6.1063).
- [11] J.C. Sweeney, D.R. Hausknecht, G. Soutar, Cognitive dissonance after purchase: a multidimensional scale, *Psychol. Mark.* 17 (2000) 369–385 369–385, doi:[10.1002/\(SICI\)1520-6793\(200005\)17:53.3.CO;2-7](https://doi.org/10.1002/(SICI)1520-6793(200005)17:53.3.CO;2-7).