



# Do Pro-Vegetarian Online Ads Make a Difference?

## Meat Eaters' Personalities and the Stability of Meat Consumption and Carnism

Bachelorarbeit von

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### **Abstract**

Our society's vast consumption of meat has negative impacts on animal welfare, the environment, and human health. This study evaluates the effects of pro-vegetarian online ads on meat consumption and carnism, the ideology of eating animals. It was also investigated how individual differences in personality and attitudes are linked to meat consumption and carnistic beliefs. In the first part of the online experiment, participants were randomly assigned to either a shocking video of animal abuse in animal husbandry plants, a video illustrating negative impacts of meat consumption on the environment, especially on climate change, or an unrelated control video. Different attitudinal and personality measures, including carnism, as well as participants' eating behavior and motivation for diet change were assessed. One week and one month later, subjects were repeatedly asked about their eating choices and carnistic beliefs. Eating meat and carnism were found to be positively correlated with sexism and, in case of carnism, also with narcissism. Additionally, negative links to openness and tender-mindedness were demonstrated. Meat consumption and carnism were also positively related to each other. Computing multilevel models, we found that, although both the shock and the environmental video motivated participants to eat less meat, they did not affect their actual meat consumption and carnistic attitudes. Previous research has demonstrated that barriers on the way to reduced meat intake might include gustatory pleasure, habit, status, and social norms and pressures. Individuals were also found to use moral disengagement strategies in order to continue to eat meat, such as carnistic justifications, strategic ignorance of meat related issues, and self-exonerations. Due to several limitations of our study, future research is strongly needed to enable us to draw conclusions about the effectiveness of online ads raising awareness of animal abuse and environmental damage caused by the meat production sector.

## Introduction

Animal rights and environmental activists are discussing the excessive consumption of meat as one of the most devastating human behaviors of our time. During the last century, industrialized animal production has been rapidly growing, turning animals rather than bread into our preferred source of protein (Grigg, 1995). In addition to industrial changes, urbanization and global economic growth are contributing to this diet shift (Stabler, 2011). Worldwide, an average of 48 kg of animal flesh is being consumed per person per year, which equals 0.92 kg each week (United Nations, 2013). Our massive consumption of meat requires the annual slaughter of over 65 billion animals (Lea & Worsley, 2003). Furthermore, the average US-American currently consumes over 30% more meat than in 1960, representing a trend that is expected to be followed especially by non-Western, economically growing populations (United Nations, 2006). Influential policy makers are contributing to this development by subsidizing animal products and promoting meat as a substantial part of our everyday diet (United Nations, 2013).

Even though this increasing demand for meat is paralleled by a rising vegetarian subculture in some Western societies, it has been estimated that its global demand might increase by 70% by 2050 (United Nations, 2013). This development is considered highly problematic for several reasons: Research has shown that eating animals is associated with an increased risk for several human diseases including different types of cancer, type 2 diabetes, and cardio vascular diseases (Friel et al., 2009). Additionally, meat production is one of the main contributors to climate change and other environmental problems, such as global freshwater availability and loss of biodiversity (United Nations, 2006). Furthermore, causing a highly inefficient use of food and land resources, unrestricted meat consumption is incompatible with the predicted population growth (Roberts, 2008). The meat production sector has also been increasingly criticized for its utterly questionable treatment of animals.

To name only a few, accusations include tremendous overcrowding, unnatural feed, or inhumane and sometimes ineffective methods of slaughter (Foer, 2009).

## Theory

### Why Do People Eat Meat?

Despite the above mentioned negative aspects of eating animals, our society's demand for meat is still rising (United Nations, 2013). To develop a better understanding of this phenomenon, it is well worth having a closer look at its underlying psychological mechanisms. Research has shown that one of the main motivations for the consumption of meat is its delicious taste (Lea & Worsley, 2003; United Nations, 2006). However, at some point in their lives most meat eaters feel themselves confronted with a moral dilemma because they not only like meat, they also like animals. Eating their flesh therefore stands in stark contrast to their desire not to hurt them, which is the essence of the *meat paradox* (Loughnan, Haslam, & Bastian, 2010). In order to dissolve feelings of cognitive dissonance, some meat eaters bring their behavior into alignment with their moral ideals by rejecting meat consumption. However, most people prefer to continue to eat meat. For this purpose, they bring their beliefs in line with their behavior by relying on a largely non-conscious system of pervasive and entrenched norms, motivated cognitions, and legitimations that make it possible to deny the suffering of animals caused by meat consumption (Joy, 2009). Melanie Joy (2009) called this pro-meat ideology *carnism* and introduced the *Three Ns of Justification* (3Ns) as a core component of the carnistic belief system. These rationalizations include that eating animals is *natural*, *normal*, and *necessary* (Joy, 2009). Piazza et al. (2015) summarized that, according to the 3Ns, eating meat is what the human species evolved to do and therefore biologically determined (natural), a widespread behavior that is fully accepted and even expected in civilized society (normal), and what we need to do in order to be strong and healthy (necessary). The authors empirically supported the 3N theory by showing that

omnivores indeed justify their behavior by arguments of naturalness, normality, and necessity (Piazza et al., 2015). As shown before, they found the tastiness of meat to be another main justification for the consumption of animals. In conclusion, the authors added a fourth N of justification: People eat meat because it is natural, normal, necessary, and nice (4Ns, Piazza et al., 2015).

Other powerful means for resolving the meat paradox and morally disengaging from eating animals include the denial that so-called food animals are emotional beings who have the capacity to suffer, who have cognitive abilities, and who have moral rights (Bastian, Loughnan, Haslam, & Radke, 2012; Bratanova, Loughnan, & Bastian, 2011; Loughnan, Bastian, & Haslam, 2014).

### **What Characterizes Meat Eaters?**

Turning away from the underlying psychological mechanisms of meat consumption towards individual differences in consumers' personalities, research has revealed less consistent results. All studies which we know of that deal with the association between the Big Five personality traits (openness, conscientiousness, agreeableness, extraversion, and neuroticism; Digman, 1990) and meat consumption reported that people who are more open tend to consume less meat (Goldberg & Strycker, 2002; Keller & Siegrist, 2015; Mottus et al., 2013; Mottus et al., 2012; Pfeiler & Egloff, 2018a, 2018b; Tiainen et al., 2013). Agreeableness has also been linked negatively to meat consumption by some of these studies (Keller & Siegrist, 2015; Mottus et al., 2013; Pfeiler & Egloff, 2018a; Tiainen et al., 2013). Goldberg and Strycker (2002) reported that those scoring higher on tender-mindedness, which is a facet of agreeableness in the NEO-PI-R (Costa & McCrae, 1992), also tend to consume less meat. Tiainen et al. (2013) found that extraversion was positively associated with meat consumption, whereas Mottus et al. (2012) reported a negative relation. Results regarding the link between conscientiousness and meat consumption have been inconsistent as well, with

Mottus et al. (2013), Mottus et al. (2012), and Pfeiler and Egloff (2018a) reporting a negative and Pfeiler and Egloff (2018b) finding a positive association. Neuroticism has not been linked to meat consumption by any of these studies. It must also be noted that, with an exception of Pfeiler and Egloff (2018a), all of the above-mentioned studies used non-representative convenience samples or an indirect measure of meat consumption and therefore must be interpreted with caution.

Focusing on other personality aspects than the Big Five, it seems promising to have a closer look at narcissism and its link to meat consumption. According to Back et al. (2013), grandiose narcissism is composed of two positively correlated dimensions representing two distinct interpersonal strategies: Admiration, obtained by assertive self-enhancement, and Rivalry, driven by antagonistic self-protection. These components reflect the narcissistic goal to elevate oneself over others in order to get to the top of hierarchical systems (Zitek & Jordan, 2016). However, the endorsement of hierarchies not only seems to be a characteristic of narcissists, but also of meat eaters (Dhont, Hodson, & Leite, 2016; Dhont & Hodson, 2014; Loughnan et al., 2014). Although we do not know of any research on narcissism and meat consumption, Kavanagh, Signal, and Taylor (2013) found a positive association between the engagement in acts of animal cruelty, negative attitudes towards animals, and higher levels of the so-called Dark Triad, a composite measure of narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002).

In line with findings on meat consumption and support for hierarchies, research has revealed that those scoring higher on Social Dominance Orientation (Dhont & Hodson, 2014), authoritarianism (Loughnan et al., 2014), speciesism (Allen & Baines, 2002; Allen, Wilson, Ng, & Dunne, 2000), conservatism (Monteiro, Pfeiler, Patterson, & Milburn, 2017), as well as those endorsing right-wing ideologies (Allen et al., 2000; Dhont & Hodson, 2014) tend to



consume more meat. Furthermore, Piazza et al. (2015) found that approving the 4Ns (eating animals is natural, normal, necessary, and nice) is positively linked to consuming meat.

Monteiro et al. (2017) investigated how carnism is related to the Big Five, meat consumption, racism, and sexism. Carnistic beliefs were measured using the novel Carnism Inventory, that Monteiro et al. developed based on research on the meat paradox and Melanie Joy's (2009) conceptualization of carnism. They argued that carnism not only comprises *carnistic defense* beliefs, including the 3Ns (Joy, 2009) and the denial of animal suffering caused by meat production, but also *carnistic domination* beliefs. These hierarchy-enhancing and more hostile beliefs might be held especially by those who feel morally superior to and less empathic towards animals and who therefore advocate their subjugation, domination, and slaughter for food (Monteiro et al., 2017). Monteiro et al. found that carnistic defense, but not carnistic domination, predicted how frequently people consume meat, while domination, but not defense, predicted whether they have ever slaughtered an animal. They also found that more agreeable and more open people were lower in domination, while there was no relation to defense. Sexism and racism, measured by the Ambivalent Sexism Inventory (ASI; Glick & Fiske, 1996) and the Symbolic Racism 2000 Scale (SR; Henry & Sears, 2002; Sears & Henry, 2003), were positively associated with domination, but not with defense (Monteiro et al., 2017). The authors did not report any association between sexism, racism, and meat consumption. While there are a few studies on racism and eating animals (Allen et al., 2000; Dhont & Hodson, 2014), we do not know of any research on the link between sexism and meat consumption.

### **What Motivates People to Eat Less Meat?**

In an attempt to raise awareness of the negative impacts of meat consumption, several campaigns and educational programs are being implemented by animal rights and environmental organizations. For instance, in times of social media it becomes a frequently

used strategy to post shocking videos of animal husbandry plants, thus publicizing the cruel conditions of living and dying in these mass factories. Such material is often collected undercover and illegally, which requires considerable effort and puts activists at risk. Therefore, it is important to evaluate if such undercover investigations are effective in changing people's behavior and thinking, specifically their dietary choices and attitudes towards eating animals.

Another relevant question is whether raising awareness of the environmental consequences of eating meat, such as the acceleration of climate change, could serve as another effective strategy for reducing overall meat consumption. It might be possible that the issue of climate change has recently become more relevant to the public than the issue of animal welfare, partly due to its increasing urgency and media coverage. If this were true, it might be promising to not only point out the living conditions and slaughter practices in meat factories, but to also educate the public about environmental consequences of meat consumption in order to decrease animal suffering.

To our knowledge, up to the present there is only one intervention study researching the effects of online ads showing undercover investigations in animal husbandry plants on meat consumption. The respective online study was conducted by Mercy for Animals (MFA, 2016b) and did not reveal any statistically significant differences in reported meat consumption between the experimental and control group two to four months after watching the online ad. However, they did find that four months after watching the video the experimental group was more likely to hold attitudes correlated with meat reduction and to intend to eat less meat. Similarly, another study by Mercy for Animals (2017) has shown that, in comparison to the control group, those who watched a video disclosing cruel conditions in animal husbandry plants were more likely to intend to reduce their meat consumption and to hold pro-vegetarian attitudes one day after the intervention.

## The Present Research

**Meat eating, carnism, and personality.** One goal of this study was to extend our knowledge regarding various correlates of meat consumption and carnism. We investigated links between meat consumption, the Big Five personality traits, tender-mindedness, narcissism, sexism, and carnism. Carnism was measured by the newly developed Carnism Inventory (Monteiro et al., 2017), which we consider a useful instrument for future animal advocacy research. Since it was not related to a comparably detailed, diary-based measure of meat consumption before, this study took a step forward in further validating the Carnism Inventory.

**Motivation for diet change and effectiveness of online ads.** We were also interested in investigating whether watching either a video of undercover investigations in animal husbandry plants (*shock video*) or a video educating the viewer about consequences of meat consumption on climate change (*environmental video*) motivates people to adapt their eating behavior. However, the main goal of this study was to find out whether watching either the shock video or the environmental video indeed changes participants' dietary choices and carnistic beliefs (in comparison to watching an unrelated video). Hereby, we contrasted Mercy for Animals (2016b) by several means.

First, MFA (2016b) only compared the usefulness of a video of undercover investigations in animal husbandry plants with that of a thematically unrelated control video. However, we also investigated the effect of watching an educational video about environmental consequences of eating animals, comparing it to undercover investigations and a control video. As far as we know, these interventions have never been compared using a randomized controlled trial before.

Second, we included the Carnism Inventory (Monteiro et al., 2017) as a measure of people's attitudes towards eating animals. MFA (2016b), however, measured people's beliefs

about animal consumption solely by the following three items: “Cows, pigs, and chickens are intelligent, emotional individuals with unique personalities.”, “I know how to replace meat, chicken, and fish dishes with appealing non-meat options.”, and “Eating less meat, chicken, and fish (in total) is the right thing to do.” We consider the Carnism Inventory to be a more comprehensive tool to evaluate participants’ pro-meat attitudes.

Third, MFA (2016b) only recruited women aged 13-25 years. In contrast, we collected data of a more diverse and therefore more representative sample by including all age groups and genders. We also gained insight into whether a German sample is more receptive to video interventions than an American one.

Fourth, to measure meat consumption, MFA (2016b) asked their participants to report how many servings of different meat products they had in the past two days. In our study, however, participants were asked about their dietary choices in the past seven days. Since people eat different amounts of meat every day, we hoped to get a more reliable diet measure by averaging participants’ meat consumption over seven instead of two days. Besides, we not only asked about the number of servings of pork, beef, and chicken, like MFA did. Instead, we used a more detailed diet journal including a variety of meat products like sausages, steaks, or meat paste.

Last, MFA (2016b) investigated people’s dietary choices two to four months after watching the videos. In our study, however, participants were asked to report their food intake one week and one month after the video intervention. We assumed that, in case there were any effects on subjects’ meat consumption, these effects might decrease over time. It seemed plausible to us that right after learning about negative impacts of eating animals, participants were more likely to act in line with their raised awareness and therefore reduce meat consumption. After a few days, however, they might gradually fall back into their old and more convenient eating patterns. By investigating both long- and short-term effects we hoped

to learn more about underlying mechanisms of eating choices after watching videos of farmed animal cruelty and the environmental impact of meat consumption.

**Hypotheses.** In line with prior research and our own considerations, we developed the following hypotheses. For H3 to H9 the respective effects were always hypothesized in comparison to the control group.

- H1.1: Openness and meat consumption are negatively correlated.
- H1.2: Tender-mindedness and meat consumption are negatively correlated.
- H1.3: Narcissism and meat consumption are positively correlated.
- H1.4: Sexist beliefs and meat consumption are positively correlated.
- H2.1: Openness and carnistic beliefs are negatively correlated.
- H2.2: Tender-mindedness and carnistic beliefs are negatively correlated.
- H2.3: Narcissism and carnistic beliefs are positively correlated.
- H2.4: Sexist beliefs and carnistic beliefs are positively correlated.
- H2.5: Meat consumption and carnistic beliefs are positively correlated.
- H3: Watching the shock video leads to a higher motivation to change eating behavior.
- H4: Watching the environmental video leads to a higher motivation to change eating behavior.
- H5: Watching the shock video leads to less meat consumption.
- H6: Watching the environmental video leads to less meat consumption.
- H7: Watching the shock video leads to a stronger decrease of meat consumption than watching the environmental video.

- H8: Watching the shock video leads to less positive attitudes towards eating meat, reflected in lower scores on the Carnism Inventory.

- H9: Watching the environmental video does not lead to a change in attitudes towards eating meat, measured by the Carnism Inventory.

## Method

### Brief Outline of the Study Design

The online experiment consisted of three different study segments. In the first segment (T0), participants were randomly assigned to either the shock video, the environmental video, or the control video. At T0, we also assessed different attitudinal and personality measures, including carnism, as well as participants' eating behavior and their motivation for diet change. One week (T1) and one month (T2) after T0, we repeatedly asked participants about their eating choices and carnistic beliefs.

### Participants

**Sample A.** We recruited a total of 758 women, 270 men, and one non-binary person ( $N = 1029$ ). Of those, 340 saw the shock video, 335 saw the environmental video, and 345 saw the control video. Participants were between 18 and 86 years old with a mean age of 28.43 years ( $SD = 11.66$ ). Student rate was 64.82%. Inclusion criteria were a minimum age of 18 years and completion of the first study segment (T0). We used Sample A for the evaluation of links between meat consumption, carnism, sexism, and different personality variables.

**Samples B and C.** In order to evaluate the effects of online ads on carnistic beliefs (using Sample B) and meat consumption (using Sample C), we computed a power analysis with the program G\*Power, version 3.1.7. (Faul et al., 2009) for a three-group between factor repeated measures design, based on the effect size  $f = .10$ , alpha level of .05, and statistical

power of .80. A target sample size of 648 participants was calculated for Sample B and Sample C, respectively.

Sample B consisted of those Sample A targets who participated in all three study segments (T0, T1, and T2), who watched the intervention video in full length, and who gave the right answer to the treatment control question (see below). A total of 420 women, 160 men and one non-binary person resulted ( $N = 581$ ). Of those, 154 saw the shock video, 202 saw the environmental video, and 225 saw the control video. Participants were between 18 and 82 years old with a mean age of 28.34 years ( $SD = 11.16$ ). Student rate was 67.81%. Sample B was used to analyze effects of the shock, environmental, and control video on carnistic beliefs. We also assessed participants' motivation to change their eating habits using Sample B.

For Sample C we excluded self-defined vegetarians and vegans from Sample B. A total of 255 women and 125 men resulted ( $N = 380$ ). Of those, 99 saw the shock video, 129 saw the environmental video, and 152 saw the control video. Participants were between 18 and 82 years old with a mean age of 29.83 years ( $SD = 11.16$ ). Student rate was 62.89%. Sample C was used to analyze effects of the shock, environmental, and control video on meat consumption.

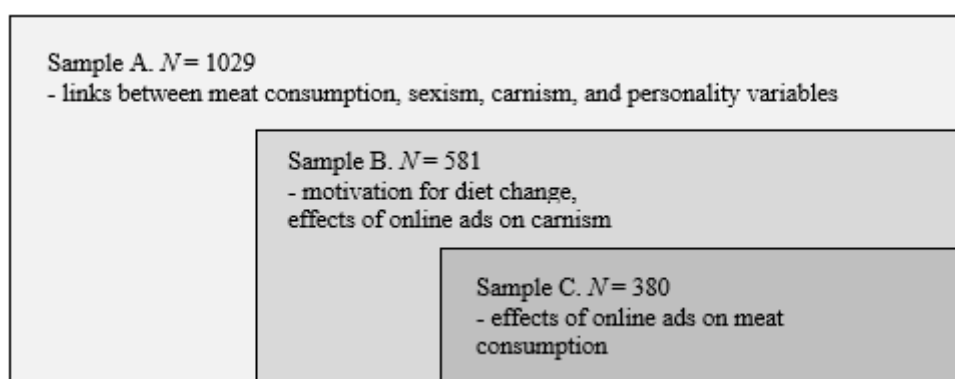


Figure 1. Illustration of sample sizes and respective research questions of Samples A to C.

## Material

**Diet measure.** Meat Consumption was measured using a self-developed diet journal (33 items, see Appendix A). The journal included different kinds of foods and drinks from fruits and vegetables over sweets, snacks, and staple foods to different animal products. We included six items for several meat products, such as sausages, steaks, meat paste, and fish (Cronbach's  $\alpha = .85$ ). Participants were asked to report how many servings of a specific food product they had during the past seven days. We used a 6-point scale ranging from *no portion* to *more than 6 portions a day*.

**Personality measures.** The Big Five personality traits (21 items, 5-point Likert scale) were measured using the German short version of the Big Five Inventory (BFI-K, Rammstedt & John, 2005) including the five facets Extraversion (3 items, Cronbach's  $\alpha = .72$ ), Agreeableness (5 items, Cronbach's  $\alpha = .46$ ), Conscientiousness (4 items, Cronbach's  $\alpha = .72$ ), Neuroticism (4 items, Cronbach's  $\alpha = .81$ ), and Openness (5 items, Cronbach's  $\alpha = .77$ ). Typical items for each facet were: "I see myself as someone who... is outgoing, sociable." (Extraversion), "...is considerate and kind to almost everyone." (Agreeableness), "...makes plans and follows through with them." (Conscientiousness), "...gets nervous easily." (Neuroticism), and "...is curious about many different things." (Openness).

Tender-mindedness (5 items, 5-point Likert scale, Cronbach's  $\alpha = .61$ ) was measured using the Tender-mindedness facet of the German NEO-PI-R Agreeableness scale (Ostendorf & Angleitner, 2004). A typical item was: "I feel sympathy for those who are worse off than myself."

Narcissism (6 items, 6-point Likert scale, Cronbach's  $\alpha = .76$ ) was measured using the German short version of the Narcissistic Admiration and Rivalry Questionnaire (NARQ-S; Back et al., 2013) comprising the two dimensions Admiration (3 items, Cronbach's  $\alpha = .77$ ) and Rivalry (3 items, Cronbach's  $\alpha = .63$ ). Typical items were: "I deserve to be seen as a great



personality.” (Admiration) and “I react annoyed if another person steals the show from me.” (Rivalry).

**Measures of attitudes.** Sexism (8 items, sliding scale from 1 to 100, Cronbach’s  $\alpha = .79$ ) was measured using a self-developed Sexism Scale (see Appendix B). We originally tested 11 items but removed three of them due to low item-scale correlations and decreased Cronbach’s alpha. We used a sliding scale where participants shifted a modulator between *girls/women* on the left and *boys/men* on the right side of the scale. Lower scores reflected higher Sexism. A typical item was: “...are better suited for jobs in the social sector.” In this example, shifting the modulator far to the right side of the scale expressed the assumption that men were much more suitable for social work than women. Shifting it to the left expressed that women were more suitable, respectively. Leaving the modulator in the middle of the scale reflected the belief that neither women nor men were better suited for work in the social sector.

Carnism (8 items, 7-point Likert scale, Cronbach’s  $\alpha = .76$ ) was measured using the German version of the Carnism Inventory (Monteiro et al., 2017) comprising the two components Carnistic Defense (4 items, Cronbach’s  $\alpha = .81$ ) and Carnistic Domination (4 items, Cronbach’s  $\alpha = .56$ ). Typical items were: “Humans should continue to eat meat because we’ve been doing it for thousands of years.” (Defense) and “I have the right to kill any animal I want.” (Domination).

**Video material.** We included three different videos in the online study. Each of them was in German and between 4:32 and 5:26 minutes in length. Participants could pause or skip the videos at any point.

**Shock video.** This drastic video by Animal Rights Watch (2017), one of Germany’s most influential animal advocacy organizations, displayed the results of two years of undercover investigations in large-scale animal husbandry plants in Germany. It showed

extreme animal suffering due to inhumane and insanitary living conditions, serious illnesses and injuries, tremendous overcrowding, or illegal killing methods and other violations against animal rights. A male speaker informed the viewer about the normality of these conditions in large-scale meat factories and about alternatives that politicians, farmers, and consumers have. The video ended with a call to action to put an end to animal suffering and choose a vegan diet.

***Environmental video.*** This animated video by Spiegel Online (2015), one of Germany's most frequently used online news providers, educated the viewer about the link between meat consumption and climate change in a calm and entertaining way. A male speaker informed the subjects about the underestimated impact of meat consumption on climate change, presenting problems like cows' methane emissions, soy-based feed for so-called food animals leading to forest clearances, fertilizing, and the global development towards meat-based diets. Different approaches to solving the issue were introduced, ending with an appeal to totally reconsider our diets. It was not apparent that the video was created by Spiegel Online to avoid effects of preconception.

***Control video.*** This short documentary by NDR *Weltbilder* (2011), a German educational television program, revealed violations of human rights caused by the textile industry for H&M in Cambodia. There were no associations to meat consumption, animal suffering, or environmental issues.

## **Procedure**

We designed the online experiment using the survey framework formr (Arslan & Tata, 2017). Participants were recruited mostly via Facebook, but also via e-mail distribution lists and ORSEE, a web-based online recruitment system (Greiner, 2015). Subjects did not receive any payment. However, those who were willing to participate in our lottery got the chance to win one of fifty Amazon vouchers in the amount of 10€. Students who needed to participate

in scientific studies for course credit received a signed note of participation, indicating one hour of time invested.

The experiment consisted of three time points: T0, T1 one week after T0, and T2 one month after T0. Clicking on the link in the online ad or e-mail directly led participants to the first time point of the study. At T0, subjects were informed about the procedure of the study, the duration of the single study segments, the compensation, and their rights as participants. They were told that the goal of the study was to learn more about the link between eating habits and moral ideals. After answering a small number of socio-demographic questions, participants completed the BFI-K, the NEO-PI-R facet scale Tender-mindedness, the NARQ-S, and the Sexism Scale. After indicating whether they were vegetarian or vegan, subjects filled out the diet journal and Carnism Inventory. Participants were then randomly assigned (using the randomization algorithm implemented in formr) and forwarded to either the shock video, the environmental video, or the control video. Because they had the chance to pause or skip the films at any point, we then asked participants whether they watched the video in full length. As a second treatment control question, subjects had to choose the correct out of three very short summaries of the video. Finally, we asked participants whether they felt motivated to change their eating behavior (*yes* or *no*) and, if applicable, how these changes could look like.

One week after submitting their answers to T0, participants received an e-mail invitation to T1. Approximately three and a half weeks after completion of T1 (exactly one month after T0), they received an e-mail invitation to T2. At T1 and T2, participants repeatedly indicated whether they were vegetarian or vegan and filled out the diet journal and Carnism Inventory. At the end of T1 and T2, subjects were asked whether they thought their eating behavior had changed in the past week (T1) or the past month (T2), respectively.

## Statistical Analyses

All statistical computations were performed using the software R 3.4.1 (R Core Team, 2017).

For all BFI-K domains, the NEO-PI-R facet Tender-mindedness, the NARQ-S domain Narcissism and NARQ-S facets Admiration and Rivalry, the Sexism Scale, the Carnism Inventory domain Carnism and Carnism Inventory facets Defense and Domination, mean scores were computed from the respective items. For Sexism, we reversed items so that higher scores on the Sexism Scale also reflected higher Sexism. Items of the diet journal that contained meat were z-standardized and then combined into a Meat Consumption index by their mean score.

We investigated links between Meat Consumption, Carnism, the Big Five personality traits, Narcissism, Tender-mindedness, and Sexism by analyzing zero-order correlations between these variables, including significance tests corrected for multiple testing (using the False Discovery Rate procedure).

A Fisher test was conducted to assess whether those who saw the shock or environmental video were more motivated to change their eating behavior than those who saw the control video.

To evaluate effects of the videos on Meat Consumption and Carnism, we ran two multilevel models with Meat Consumption and Carnism as dependent variables, respectively. For each participant, a random intercept was estimated along the three measurement occasions, which was included as a three-level factor in the model. Group membership (shock vs. environmental vs. control) was integrated as a three-level factor as well. We included gender as a dichotomous predictor in both models (the non-binary person was therefore excluded from Sample B). The meat model also contained Carnism as a continuous predictor.

In addition to main effects of these predictors, we computed a two-way interaction for Group Membership x Measurement Occasion. In both models the dependent variable constituted of multiple items. These were not included as a mean score but individually and their item number was specified as a random intercept. Both linear models were implemented using the R package brms (Bürkner, 2017). Inference was based on Bayesian 95% credibility intervals.

## Results

### Correlates of Meat Consumption and Carnism

**Meat Consumption.** As can be seen in Table 1, Meat Consumption was significantly negatively correlated with Openness and Tender-mindedness and significantly positively associated with Sexism. H1.1, H1.2, and H1.4 were therefore accepted. Unexpectedly, Meat Consumption was not significantly related to Narcissism. Hence, H1.3 was rejected.

Table 1

*Zero-order Correlations of Attitudes and Personality Measures with Meat Consumption and Carnism*

	Meat Consumption	Carnism	Carnistic Defense	Carnistic Domination
<b>Big 5</b>				
Extraversion	-0.08*	-0.04	-0.04	-0.02
Agreeableness	-0.05	-0.10**	-0.08*	-0.09*
Neuroticism	-0.16**	-0.08*	-0.07*	-0.06
Openness	-0.28**	-0.21**	-0.19**	-0.14**
Conscientiousness	-0.11**	0.06	0.06	-0.07*
<b>Additional Personality</b>				
Tender-mindedness	-0.48**	-0.28**	-0.25**	-0.22**
Narcissism	0.01	0.16**	0.11**	0.19**
Narcissistic Admiration	-0.02	0.09*	0.06	0.11**
Narcissistic Rivalry	0.04	0.19**	0.14**	0.22**
<b>Attitudes</b>				
Sexism	0.35**	0.38**	0.40**	0.16**
Carnism	0.46**	1.00	0.95**	0.65**
Carnistic Defense	0.48**	0.95**	1.00	0.37**
Carnistic Domination	0.19**	0.65**	0.37**	1.00

Note.  $N = 1029$  (Sample A)

\* $p < .05$ , \*\* $p < .01$ .

**Carnism.** As expected, Carnism, Carnistic Defense, and Carnistic Domination were significantly negatively related to Openness and Tender-mindedness (see Table 1). Thus, H2.1 and H2.2 were accepted. Furthermore, Carnism, Defense, and Domination were significantly positively associated with Narcissism and Narcissistic Rivalry. Narcissistic Admiration was also significantly positively associated with Carnism and Carnistic Domination, but not with Carnistic Defense. Consequently, H2.3 was only partly accepted. Additionally, Carnism and both Defense and Domination were significantly positively related to Sexism and Meat Consumption. We therefore accepted H2.4 and H2.5.

### **Motivation for Diet Change**

We found that 49% of the shock group, 40% of the environmental group, and 0.05% of the control group were motivated to change their eating behavior after watching the respective video. The Fisher test showed that differences in motivation between the shock and control group ( $p < .001$ ) and the environmental and control group ( $p < .001$ ) were highly significant. Consequently, participants who watched the shock or the environmental video were more motivated to change their eating behavior than those who watched the control video. Therefore, H3 and H4 were accepted.

### **Effectiveness of Online Ads**

**Meat Consumption.** As can be seen in Table 2, being female predicted eating less meat. We also found that those who endorse carnistic beliefs tend to consume more meat. However, controlling for gender and Carnism, there were no significant interactions between group membership (shock vs. environmental vs. control) and time points of the study.

Thus, in comparison to the control video, neither the shock nor the environmental video influenced Meat Consumption (see Figure 2). People did not consume more or less meat one week or one month after being confronted with undercover investigations in animal

husbandry plants or environmental consequences of eating animals. Hypotheses H5, H6, and H7 were therefore rejected.

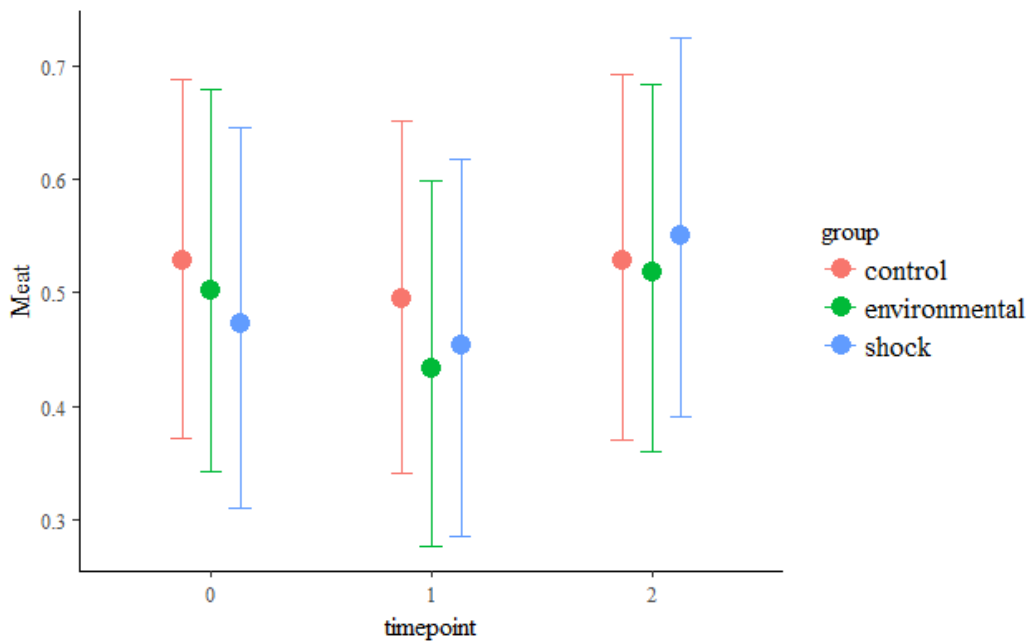
Table 2

*Results of the Mixed Linear Model Predicting Meat Consumption*

	$\beta$	Standard Error	95% CI
Intercept	0.49	0.08	[0.34, 0.66]
T1	-0.03	0.04	[-0.12, 0.05]
T2	0.00	0.05	[-0.09, 0.09]
Environmental group	-0.02	0.07	[-0.17, 0.11]
Shock group	-0.05	0.08	[-0.21, 0.09]
Gender (female)	-0.31*	0.05	[-0.41, -0.21]
Carnism	0.16*	0.03	[0.09, 0.22]
T1 x environmental group	-0.03	0.07	[-0.16, 0.10]
T2 x environmental group	0.02	0.07	[-0.12, 0.15]
T1 x shock group	0.01	0.07	[-0.13, 0.16]
T2 x shock group	0.08	0.08	[-0.07, 0.23]

*Note.*  $N = 380$  (Sample C). CI = confidence interval.

\*CI does not contain the value of 0.



*Figure 2.* Means and 95% confidence intervals of Meat Consumption among groups from T0 to T2.

**Carnism.** As Table 3 shows, being female predicted lower scores on the Carnism Inventory. We also found that participants, irrespective of their group membership, held less carnistic beliefs at T2 than at T0. However, controlling for gender, there were no significant

interactions between group membership (shock vs. environmental vs. control) and time points of the study. Thus, in comparison to the control video, neither the shock nor the environmental video affected participants' carnistic beliefs one week and one month after the intervention (see Figure 3). Learning about conditions in animal husbandry plants or environmental consequences of meat consumption did not influence people's attitudes towards eating animals. Hypothesis H8 was therefore rejected, while H9 was accepted.

Table 3  
*Results of the Mixed Linear Model Predicting Carnism*

	$\beta$	Standard Error	95% CI
Intercept	0.21	0.06	[0.09, 0.66]
T1	-0.04	0.03	[-0.12, 0.01]
T2	-0.07*	0.03	[-0.13, -0.02]
Environmental group	0.03	0.06	[-0.09, 0.14]
Shock group	-0.04	0.06	[-0.17, 0.08]
Gender (female)	-0.22*	0.05	[-0.32, -0.11]
T1 x environmental group	-0.04	0.04	[-0.12, 0.04]
T2 x environmental group	-0.01	0.04	[-0.09, 0.07]
T1 x shock group	-0.02	0.04	[-0.10, 0.07]
T2 x shock group	0.00	0.04	[-0.09, 0.08]

Note.  $N = 580$  (Sample B without non-binary person). CI = confidence interval.

\*CI does not contain the value of 0.

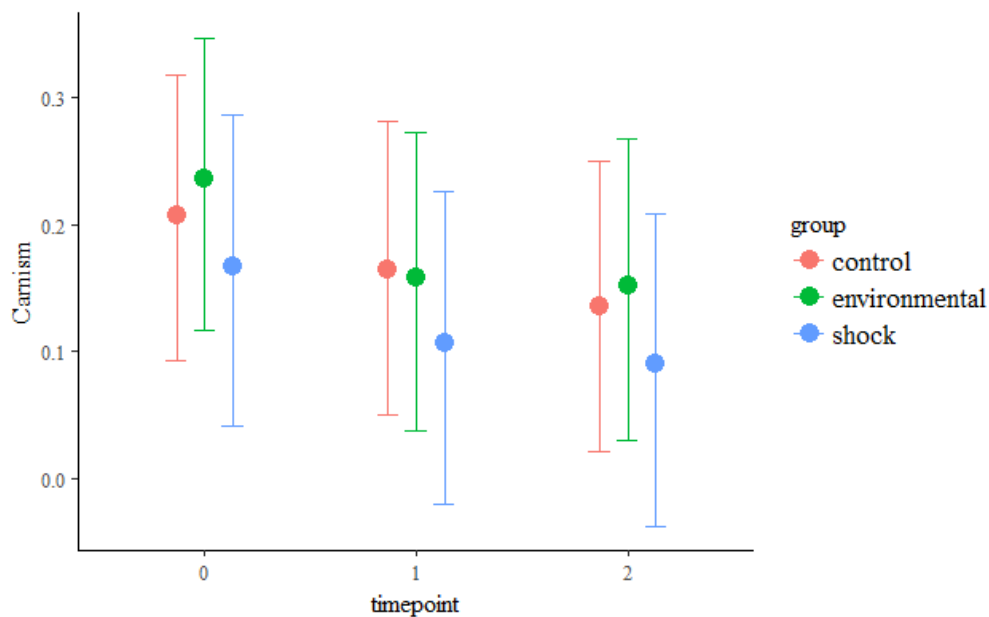


Figure 3. Means and 95% confidence intervals of Carnism among groups from T0 to T2.



## Discussion

### Goals and Expectations

Animal rights and environmental organizations increasingly use social media to raise awareness of the negative impacts of meat consumption. It has become a frequently used strategy to post online ads publicizing shocking discoveries of undercover investigations in animal husbandry plants. Other videos educate the viewers about the negative impact of meat consumption on climate change and further environmental issues. The main aim of this research therefore was to evaluate whether such shocking and environmentally educating online ads affect people's behavior and thinking. First, we expected participants who watched the shock or environmental video to reduce their meat consumption. Second, we expected the shock group to hold less attitudes in favor of meat consumption after watching the video, reflected in lower scores on the Carnism Inventory (Monteiro et al., 2017). However, we did not expect a change of carnistic beliefs in the environmental group since the Carnism Inventory does not aim at people's environmental convictions regarding meat consumption. Third, we hypothesized the shock and environmental video to motivate subjects to change their eating behavior, irrespective of actual diet changes.

To learn more about different motivations for why and how much meat people consume, another aim of this study was to investigate how individual differences in personality and attitudes are linked to endorsing carnistic beliefs and eating animals. We expected meat consumption and carnism to be positively linked to narcissism and sexism and negatively to openness and tender-mindedness, a facet of agreeableness. We also hypothesized carnism and meat consumption to be positively associated with each other.

### Explanation of Results

**Effectiveness of online ads.** Inconsistent with our hypotheses, neither the shock nor the environmental video affected how much meat people consumed one week and one month

after the intervention. Concerning the shock video, this finding is in line with research by Mercy for Animals (2016b), who also compared an online ad showing undercover investigations in animal husbandry plants with an unrelated control video regarding their effects on meat consumption. The authors did not find any differences in how much meat participants consumed two to four months after seeing the videos. Even though we do not know of any studies on effects of environmental education in the form of online ads, our findings support research by Pohjolainen, Tapio, Vinnari, Jokinen, and Räsänen (2016) as well as Macdiarmid, Douglas, and Campbell (2016). Both studies concluded that raising awareness of the environmental impact of eating meat needs to be combined with other interventions in order to successfully lower individuals' meat consumption (Macdiarmid et al., 2016; Pohjolainen et al., 2016).

Turning towards the effects of online ads on carnism, we found that watching the shock video did not change people's attitudes towards eating animals. Unexpectedly, one week and one month after seeing the online ad participants did not hold stronger or weaker carnistic beliefs than those who watched the control video. In line with our hypothesis, subjects who watched the environmental video did not change their carnistic attitudes either. However, irrespective of group membership, participants showed a slight decrease in carnism one month after the video intervention.

Regarding participants' motivation for diet change, we found that watching the environmental video motivated people to adapt their eating habits, compared to seeing the control video. Similar to MFA (2016b, 2017), we also demonstrated that watching the shock video led to a higher motivation for diet change. However, unlike MFA, we did not ask participants whether they were willing to change their meat consumption but only their diet in general. Even though we assume that subjects referred to restricting meat consumption when

stating to be motivated to change their eating habits, we cannot be entirely sure of this conclusion.

Consistent with Godinho, Alvarez, Lima, and Schwarzer's (2014) conclusion, our findings show that diet changes seem to require much more than simply having good intentions. The discrepancy between participants' initial motivation to eat less meat and their eventual maintenance of old consumption patterns and carnistic attitudes reflects several burdens on the way to reduced meat intake. Graça, Oliveira, and Calheiro (2015) demonstrated that many omnivores share an affective connection towards meat, accompanied by signs of attachment and dependency (i.e. feelings of deprivation and sadness) when considering leaving it off their plate. This is not surprising since preferences and choices are often based on shared conventions, meanings, and values that go beyond their biological function (Beardsworth & Keil, 2002). Meat is viewed as pleasurable and desirable in most parts of the world not only because it provides us with nutrients or because it tastes good (Joy, 2009; Lea & Worsley, 2003). In fact, in the human society of commensality (eating in community), food also serves as a social vehicle that can provide social bonding (Fischler, 2011). However, since eating animals has become part of the social norm in most Western societies, this might also inhibit individual attempts to go vegetarian. As Lea and Worsley (2003) found, people tend to worry about being viewed as strange and becoming outsiders if they abstain from meat consumption. Furthermore, eating animals seems to be especially meaningful for men and status-oriented individuals since meat has been found to be a symbol of masculinity and high standing (e.g. Rothgerber, 2013).

Being confronted with eating meat, individuals might therefore not only find themselves influenced by feelings of shame and guilt, but also by powerful motivators such as pleasure, habit, social norms and pressures as well as virility and status. Consequently, most people develop strategies that help them reduce cognitive dissonance and facilitate the

practice of meat consumption (Joy, 2009; Loughnan et al., 2014). Bandura's (1999, 2002) moral disengagement theory proposes that individuals tend to apply disengagement mechanisms especially when maintaining harmful but self-serving behaviors. Concerning the meat paradox, these moral disengagement strategies might include carnistic justifications like the 4Ns (eating meat is natural, normal, necessary, and nice), denying that food-animals have the capacity to suffer, or telling oneself that animal abuse in the meat production sector is rather an exception than the rule (Joy, 2009; Piazza et al., 2015). With respect to environmental issues linked to meat consumption, justifications mainly include self-exonerations, such as playing down one's own impact on environmental outcomes and displacing personal responsibility towards meat producers and the government (Onwezen & van der Weele, 2016). Individuals also tend to strategically ignore information on meat related issues, be skeptical of the scientific evidence, or frame the situation as unclear due to contrasting information (Onwezen & van der Weele, 2016). Furthermore, many consumers perceive a lack of practical know-how as a major hindrance on their way to a more plant-based diet (Pohjolainen et al., 2016).

These might only be some of the factors preventing society's transition to reduced meat intake. We strongly need future research to identify how consumers can be effectively supported in bringing their behavior in line with their beliefs and how awareness can be successfully raised in the first place. With respect to awareness building interventions, Joy (2009) argues that eating meat could be reduced by emphasizing that it is not a necessity, but rather a choice which is built upon a sophisticated belief system. She proposes that educating individuals about carnism as a largely non-conscious, defensive, and violent ideology underlying meat consumption will make them realize the absurdity and perversity of eating animals. Regarding the present research, this might partly explain the slight decrease of carnistic attitudes averaged above all groups one month after the intervention: Repeatedly

confronting participants with items of the Carnism Inventory (Monteiro et al., 2017) might have built awareness of so far unconscious carnistic beliefs, resulting in their adaptation.

**Correlates of meat consumption.** In line with our hypothesis and several previous studies (e.g. Keller & Siegrist, 2015; Pfeiler & Egloff, 2018a, 2018b; Tiainen et al., 2013), we found openness to be negatively linked to meat consumption. Prior research has demonstrated that individuals who are more open tend to try new foods more often (Steptoe, Pollard, & Wardle, 1995). In our Western society, where eating animals is what most people grow up with, testing unfamiliar vegetarian or vegan dishes and readily adopting to vegetarianism as a modern trend should therefore logically be related to higher levels in openness to new experiences.

Consistent with our expectation and prior research by Goldberg and Strycker (2002), tender-mindedness, as a facet of the NEO-PI-R agreeableness scale (Costa & McCrae, 1992), was also negatively correlated with meat consumption. It has been shown that ethical concerns regarding animal rights and animal welfare are among the main motivations to restrict meat consumption (e.g. Forestell, Spaeth, & Kane, 2012). As Keller and Siegrist (2015) reasoned, more agreeable (and therefore most likely more tender-minded) individuals might have a greater tendency towards these altruistic motives.

Furthermore, the expected positive link between eating animals and holding sexist beliefs was confirmed. This might be explained by several ideological values that sexists and omnivores seem to share. Both sexism and meat consumption were found to be positively related to Social Dominance Orientation, right-wing authoritarianism, and the endorsement of hierarchical systems (e.g. Dhont & Hodson, 2014; Loughnan et al., 2014; Lee, 2013). Consequently, finding inequality and dominance acceptable might be part of an underlying belief system that fosters both sexist attitudes and eating animals.

In contrast to what was hypothesized, meat consumption was not associated with narcissism. However, our hypothesis did not have a strong theoretical foundation. On the one hand, it was based on findings by Kavanagh et al. (2013), who demonstrated a positive relation between the engagement in acts of animal cruelty, negative attitudes towards animals, and higher levels of the Dark Triad, a composite measure of narcissism, Machiavellianism, and psychopathy. However, acting aggressively towards and thinking negatively about animals might not necessarily go along with eating them. Additionally, the Dark Triad should not be considered synonymous with narcissism. On the other hand, we based our hypothesis on both narcissists' and omnivores' support for hierarchical systems (Dhont & Hodson, 2014; Zitek & Jordan, 2016). We do recognize, however, that it is much more than the endorsement of hierarchies that motivates people to eat meat or abstain from it (see Ruby, 2012).

**Correlates of carnism.** We found carnism, including carnistic defense and carnistic domination, to be negatively correlated with openness and tender-mindedness and positively with sexism. This partly supports findings by Monteiro et al. (2017), who found that domination, but not defense, was negatively linked to openness and agreeableness and positively to sexism. In addition, we found that carnism, including defense and domination, was positively related to narcissism and Narcissistic Rivalry. However, while carnism and domination were also positively associated with Narcissistic Admiration, no relation between Admiration and defense was found. Furthermore, we demonstrated that those who hold stronger carnistic beliefs (including both defense and domination) also tend to consume more meat. Again, this agrees with Monteiro et al. only to some extent, who found that carnistic defense, but not domination, predicted individuals' frequency of meat consumption. With an exception of the missing positive link between Narcissistic Admiration and carnistic defense, all hypotheses concerning carnism were confirmed. We assume that differences between Monteiro et al.'s and our findings might partly be due to different sample characteristics, including the proportion of students and females, participants' mean age, and their nationality.

Furthermore, we contrasted Monteiro et al. by using a more detailed, diary-based diet journal to measure meat consumption.

We assume that the negative link between openness and carnism might be due to the fact that the carnistic belief system relies on entrenched and pervasive values that most Westerners adopt from a very young age on (Joy, 2009). We are both consciously and unconsciously influenced by cultural norms telling us that some animals are there to be eaten while others are not (Joy, 2009). Thus, it is not surprising that resolving such deep-rooted conditioning and making oneself receptive for alternative ideologies, such as vegetarianism, requires high levels in openness to new experiences. Similarly, high levels in tender-mindedness were found to be negatively linked to carnism. Tender-mindedness as part of the German NEO-PI-R Agreeableness scale is characterized by a positive idea of man, the adaptability of one's own point of view, and empathy, a variable that mitigates aggression (Ostendorf & Angleitner, 2004; Dodge, 2006). Consequently, we assume that carnism, being a defensive, hostile, and dominance-oriented ideological system, should contrast many of the values that tender-minded people share. Concerning carnism's positive link to sexism, our study provides evidence for Monteiro et al.'s (2017) assumption that both carnism and sexism are based on prejudicial attitudes. While carnists hold prejudices towards so-called food-animals, sexists hold prejudices towards a specific gender, usually females. According to the Interspecies Model of Prejudice (Costello & Hodson, 2010), hierarchical or negative attitudes towards human groups are even originating from prejudices towards animals. The (mostly) positive relation between carnism and narcissism is consistent with this assumption. For narcissists, however, it might not be a specific human group that is perceived as negative and inferior, but simply the rest of humanity. Finally, the positive link between carnism and meat consumption demonstrates that carnistic behaviors indeed seem to be justified by carnistic beliefs. This supports Joy's (2009) notion that the practice of eating (specific) animals is legitimized by an underlying ideological belief system.

### **Limitations and Recommendations for Future Research**

Due to the following limitations of our study, we do not feel confident to draw any conclusions on whether awareness building videos of animal abuse in animal husbandry plants or the relation of meat consumption and environmental damage have any effect on people's meat consumption and carnistic beliefs. In order to dissolve this unclarity and learn more about different motives for meat reduction, we strongly need future studies that ideally address the following methodological weaknesses of our research.

First, our study is limited by several sample-related issues. For instance, we did not achieve the target sample sizes for reliably evaluating effects of online ads on meat consumption, carnism, and people's motivation for diet change. Especially regarding the investigation of impacts on meat consumption our study was highly underpowered. Furthermore, our samples consisted of two to three times more women than men and approximately 65% students, which is not representative of the overall population and therefore restricts generalizations of the findings. In addition, since we only included Germans in our study, we are unable to draw any conclusions regarding other countries or cultures. We also had to exclude considerably more participants of the shock than the environmental or control group because they did not watch the video in full length. We suspect that this might have been due to strong emotions like anger or disgust elicited by the shock video, which possibly led to undesirable selection effects. For instance, those who skipped the video might have been especially sensitive and therefore would have been more receptive to the intervention than those who watched the video in full length. Consequently, future research should try to collect representative and large-scale samples, ideally including individuals from different nationalities and cultures. Regarding undercover investigations, it should be investigated how to best reach individuals that might be unwilling or emotionally unable to watch drastic recordings of animal abuse.



Second, we measured meat consumption based on self-reports. However, it was found that self-reports on dietary choices are often unreliable due to recall bias or concerns regarding social desirability (e.g. Kimberlin & Winterstein, 2008). Furthermore, research showed that diet-change interventions can change how subjects self-report their eating behavior (Nataranjan et al., 2010). In addition to their dietary choices, we also suspect participants' answers on the Carnism Inventory (Monteiro et al., 2017) to be influenced by social desirability. Future studies could therefore profit from the use of objective measures and, regarding meat consumption, could compare self-reports to actual behavior.

Third, Mercy for Animals (2016a) found that different elements of shock videos, such as using a narrator vs. subtitles or talking about farmed animal intelligence, have different effects on people's motivation to reduce meat consumption. This demonstrates that slightly differing videos, even though they outline the same topic (e.g. cruelty in animal husbandry plants or environmental effects of meat consumption), might have different consequences on behavior. Thus, we cannot draw any conclusions regarding the effectiveness of shock videos of animal abuse or videos illustrating negative impacts of meat consumption in general. Strictly speaking, we can only interpret our findings with respect to the two specific online ads we used. Future research should therefore compare the effects of slightly differing videos in order to identify their most impactful elements.

Fourth, concerning links between meat consumption, carnism, personality, and attitudes, our research is limited due to its cross-sectional design. As a result, no conclusions can be made regarding the causality of these relations. Longitudinal studies are needed to evaluate whether personality traits and attitudes affect meat consumption, meat consumption influences personality traits and attitudes, or both.

## **Conclusion**

The main goal of this study was to evaluate whether watching online ads showing shocking animal rights violations in animal husbandry plants or illustrating negative environmental impacts of eating meat changes people's meat consumption and carnistic beliefs. Findings of this randomized controlled trial demonstrated that, even though both online ads motivated participants to change their diets, neither the shock nor the environmental video affected how much meat people consumed and which attitudes they held towards eating animals. This might be due to numerous barriers on the way to vegetarianism, including gustatory pleasure, habit, status, or social norms and pressures. However, due to several limitations of our study, we strongly need future research that enables us to draw conclusions about the effectiveness of online ads raising awareness of animal abuse and environmental damage caused by meat production. The second goal of our study was to investigate how individual differences in personality and attitudes are related to meat consumption and carnism. Endorsing carnistic beliefs and consuming meat were negatively linked to openness to new experiences and tender-mindedness, while positively related to sexism. Narcissism was (mostly) positively associated with holding carnistic attitudes, while it was not linked to eating meat. Furthermore, meat consumption and carnism were positively related to each other. The latter supports Joys (2009) notion that the behavior of eating meat is justified by an underlying ideological belief system called carnism. Longitudinal studies are needed to investigate causal relationships between personality, attitudes, including carnism, and meat consumption.

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(at least when narcissists think they can rise to the top). *Social Psychological and*

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## Appendices

### Appendix A

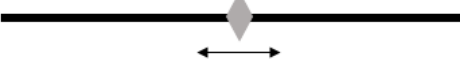





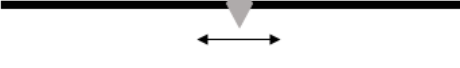

**Diet journal.** Participants were instructed as follows: „Im Folgenden würden wir gerne etwas über Ihre Ernährungsgewohnheiten erfahren. Bitte überlegen Sie dafür genau, wie Sie sich *in den vergangenen sieben Tagen* ernährt haben. Bitte setzen Sie dafür ein Kreuz in der betreffenden Spalte. Erinnerung: Die Mengenangaben beziehen sich auf die vergangenen sieben Tage.“

	Keine Portion	Insges. 1-2 Portionen in der letzten Woche	Insges. 3-4 Portionen in der letzten Woche	Ungefähr eine Portion am Tag	3 bis 5 Portionen am Tag	6 oder mehr Portionen am Tag
Softdrinks, 1 Portion = 1 Glas						
Saft, 1 Portion = 1 Glas						
Milch (Kuh-, Schaf-, Ziegen-), 1 Portion = 1 Glas						
Pflanzliche Drinks (Soja-, Hafer-, Reis-, ...), 1 Portion = 1 Glas						
Obst, 1 Portion = 1 Handvoll						
gemischter Salat, 1 Portion = 1 Viertelsteller						
Rohes Gemüse, 1 Portion = 1 Handvoll						
Gekochtes Gemüse (außer Kartoffeln), 1 Portion = 1 Viertelsteller						
Kartoffeln bzw. Kartoffelprodukte (Brei, Pommes, ...), 1 Portion = 1 Viertelsteller						
Reis, 1 Portion = 1 Viertelsteller						
Nudeln, 1 Portion = 1 Viertelsteller						
Brot, 1 Portion = 1 Scheibe						
Joghurt auf Milchbasis, 1 Portion = 1 (kleiner) Becher						

Süße Desserts auf Milchbasis (Pudding, Eis, Grießbrei, Milchreis, ...), 1 Portion = 1 Becher						
Kuchen, 1 Portion = 1 Stück						
Käse auf Milchbasis, 1 Portion = 1 Scheibe						
Frischkäse, 1 Portion = 1 Esslöffel						
Veganer Aufstrich, 1 Portion = 1 Esslöffel						
Marmelade, 1 Portion = 1 Esslöffel						
Honig, 1 Portion = 1 Esslöffel						
Butter, 1 Portion = 1 Esslöffel						
Pflanzliche Margarine, 1 Portion = 1 Esslöffel						
Eier, 1 Portion = 1 Stück						
Wurstaufschnitt (gekochter Schinken, Salami, Mortadella, ...), 1 Portion = 1 Scheibe						
Streichwurst (Leber-, Mettwurst, ...), 1 Portion = 1 Esslöffel						
Wurst im Darm (Wiener, Bratwurst, Weißwurst, ...), 1 Portion = 1 Stück						
Rotes Fleisch (Rindersteak, Schweinebraten, ...), 1 Portion = 1 Stück						
Weißes Fleisch (Hähnchen-/Putenschenkel, -brust, -schnittel, ...), 1 Portion = 1 Stück						
Fisch, 1 Portion = 1 Filetstück						
Fleischersatz (Tofu, Tempeh, Seitan, ...), 1 Portion = 1 Scheibe bzw. Stück						
Salzige Snacks (Chips, Nüsse, Salzstangen, ...), 1 Portion = 1 Handvoll						
Süßigkeiten (Schokolade, Gummibären, Riegel, ...), 1 Portion = 1 Handvoll						

## Appendix B

**Sexism Scale.** Participants were instructed as follows: “Bitte vergleichen Sie nun Frauen/Mädchen und Männer/Jungen bezüglich der folgenden Aussagen, indem Sie den Regler nach links oder rechts schieben. Es geht um Ihre ganz persönliche Einschätzung und gibt keine richtigen oder falschen Antworten.“

Die Farbe Rose passt besser zu...	Frauen/Mädchen  Männer/Jungen
... sind insgesamt braver.	Frauen/Mädchen  Männer/Jungen
Körperbehaarung gehört sich eher für ... (reversed)	Frauen/Mädchen  Männer/Jungen
... können besser mit Kindern umgehen.	Frauen/Mädchen  Männer/Jungen
Kleider oder Röcke passen eher zu...	Frauen/Mädchen  Männer/Jungen
... sind insgesamt ängstlicher.	Frauen/Mädchen  Männer/Jungen
... können schneller lernen, mit Computern umzugehen. (reversed)	Frauen/Mädchen  Männer/Jungen
... eignen sich besser für soziale Berufe.	Frauen/Mädchen  Männer/Jungen

### **Selbstständigkeitserklärung**

Hiermit versichere ich, dass ich die Arbeit mit dem Titel “Do Pro-Vegetarian Online Ads Make a Difference? Meat Eaters’ Personalities and the Stability of Meat Consumption and Carnism” selbstständig verfasst und keine anderen als die angegebenen Hilfsmittel und Quellen benutzt habe.

.....

Datum

.....

Unterschrift