

Accepted Manuscript

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PII: S0195-6663(16)30512-8

DOI: [10.1016/j.appet.2017.02.011](https://doi.org/10.1016/j.appet.2017.02.011)

Reference: APPET 3329

To appear in: *Appetite*

Received Date: 4 October 2016

Revised Date: 2 February 2017

Accepted Date: 3 February 2017

Please cite this article as: Monteiro C.A., Pfeiler T.M., Patterson M.D. & Milburn M.A., The Carnism Inventory: Measuring the Ideology of Eating Animals, *Appetite* (2017), doi: 10.1016/j.appet.2017.02.011.

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The Carnism Inventory: Measuring the Ideology of Eating Animals

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This research was funded by grants from the University of Massachusetts, Boston's Provost Research Scholarship, Honors Research Fund, and the McCormack Scholars Fellowship of the McCormack Graduate School of Policy and Global Studies.

Acknowledgements

The authors would like to thank Erin Hennes, Boris Egloff, Cornelia Wrzus, Mario Wenzel, Kiera Hudson and Shaun O'Grady for their critical and insightful comments on this article.

The Carnism Inventory: Measuring the Ideology of Eating Animals

“All animals are equal, but some animals are more equal than others.”

– George Orwell (1945), *Animal Farm*

Meat consumption has played a significant role in human evolution. Humans began to eat animals approximately 2.5 million years ago, and the transition from an herbivorous to an omnivorous diet is thought to have contributed to the development of early human societies (Stanford, 1999), physiology (Milton, 1999) and intelligence (Aiello & Wheeler, 1995). In the present, meat is consumed in vast quantities (American Meat Institute, 2011), and the processes through which billions of animals are turned into food are associated with widespread ethical concerns as well as environmental and health consequences. The practices used to raise and slaughter animals are increasingly criticized for being inhumane and ethically problematic (Singer, 1977) and have drawn increasing media coverage (e.g., “The Daily Show with Jon Stewart”, 2015). Additionally, the meat industry produces more greenhouse gases than any other industry (United Nations, 2006), and a growing body of research links meat consumption to increased risk of obesity, heart disease, and cancer (Sinha, Cross, Graubard, Leitzman, & Schatzkin, 2009; Wang & Beydoun, 2009; Chao et al., 2005). Despite the fact that plant-based alternatives to meat not associated with these consequences are available in the U.S., most Americans include animal products in their diets (Gallup, 2012).

The predominant lay theory explaining why people eat animals is that meat simply tastes good (Lea & Worsley, 2003). In the present article we argue that the phenomenon of eating animals is more complex than it appears. We posit that meat

consumption is not simply a gustatory behavior, but also an ideological one, and take the first steps in empirically investigating the belief system of the meat-eating majority by developing a brief measure of the ideology of eating animals. To this end, we integrate prior theory about carnism and research on meat consumption in order to present a broadened theoretical understanding of the beliefs that facilitate the practice of eating animals.

Carnism: The Ideology of Eating Animals

Numerous philosophers have argued that societies' norms of eating certain species and not others express prejudices against those animals (Francione, 2008; Regan, 1983; Singer, 1977). In the case of meat consumption, Joy (2009) has posited that these prejudices are supported by an ideology that she named carnism. Joy (2009) argued that the carnistic system relies on violence because meat cannot be produced without killing animals. Carnism is assumed to be a pervasive, entrenched, and largely non-conscious system of norms, legitimations and motivated cognitions that allows people to deny animal suffering caused by the meat production process in order to perpetuate the consumption of animals (Joy, 2009). In line with these assumptions, recent research has demonstrated that people are motivated to justify meat consumption and morally disengage from this behavior (Graça, Calheiros, & Oliveira, 2016; Haslam, Loughnan, & Holland, 2012).

Defending meat consumption. Joy (2009) suggested that carnistic beliefs include arguments that humans should eat meat because it is normal, natural and necessary to do so. Recent research supports the hypothesis that meat-eating behavior is related to different categories of legitimations for meat consumption. Piazza and colleagues (2015)

found that when asked to provide justifications for the consumption of animals, meat eaters reference the beliefs that eating meat is normal, necessary, natural, and that meat tastes good. Similarly, Rothgerber (2012) proposed a number of categories of justifications for meat consumption.

Denying the harm meat production inflicts on animals is also a powerful means for defending eating animals and morally disengaging from this behavior. Connecting animals and meat can result in cognitive dissonance (Prunty & Apple, 2013), and as a result, many meat eaters are confronted with the so called “meat paradox” (Loughnan, Haslam, & Bastian, 2010; Herzog, 2010;). The meat paradox describes the moral conflict meat eaters may experience when they care about animals, but also want to eat them (Loughnan et al., 2010). Consistent with cognitive dissonance theory (Festinger, 1957; Harmon-Jones & Mills, 1999), this conflict can be resolved by bringing one’s beliefs and attitudes in line with one’s behavior. Prior research has shown that the meat paradox can be resolved by either rejecting meat consumption or denying animals’ cognitive capacities, reducing the moral concern for them in order to justify the act of eating them (Bastian, Loughnan, Haslam, & Radke, 2012; Loughnan, Bastian, & Haslam 2014). Meat eaters also attribute fewer psychological characteristics to animals than do vegetarians (Bilewicz, Imhoff, & Drogosz, 2011).

Carnism Theory (Joy, 2009) and research regarding the meat paradox describe people as being unwitting or regretful participants in animal agriculture. Based on the original conceptualization of carnism (Joy, 2009) and research on the meat paradox, we argue that one component of carnism is comprised of *carnistic defense* beliefs, which provide justifications for meat consumption. According to this view, people like animals

and do not wish them harmed; however, they also like eating meat, and are either intent on defending or are unaware of the carnistic system. Therefore, they rely on justifications to reduce their discomfort with the death inherent in meat production. However, we also posit that liking animals is not the only the reason why people hold beliefs that defend meat-eating, and that people can defend carnism without having positive attitudes toward animals. For example, Dhont and Hodson (2014) found that people eat more meat if they believe that vegetarianism (the ideological opposite of carnism) is a threat to the status quo.

Dominating animals. Recent research often contends that people care about animals and does not take into account that some individuals might experience little or no distress when confronted with the animal-meat connection because they are less empathic toward animals (Pfeiler & Wenzel, 2015). For example, carnistic behaviors like recreational hunting involve actively and volitionally killing animals, and would be difficult to engage in if you like or empathize with the animal being killed. We expand on the original conceptualization of carnism by arguing that there is a second, more hostile, and hierarchy-enhancing category of carnistic beliefs, *carnistic domination*, organized around the domination of animals in the context of meat consumption. Carnistic domination beliefs justify the domination, subjugation, and killing of animals for food; therefore, these beliefs support the hierarchy between animals and humans. Many people are not personally involved with the processes that provide them with meat, however, and carnistic domination beliefs likely justify paying for others to kill animals for meat.

Singer (1977) has argued that the attitude that humans are morally superior to animals and are ethically allowed to use and kill them is a form of prejudice based on

species membership, which was termed *speciesism* (Ryder, 1970). Speciesism has been found to relate to social dominance orientation (SDO; Dhont, Hodson, Costello, & MacInnis, 2014), a known predictor of prejudice (Kteily, Ho, & Sidanius, 2012). Recent research has demonstrated that speciesism is associated with meat consumption (Dhont & Hodson, 2014) and that individuals higher in SDO are more likely to include meat in their diet (Allen, Wilson, Ng, & Michael, 2000; Vesper, Taylor, & Singer, 2015; Wilson & Allen, 2007). Moreover, Dhont and Hodson (2014) have shown that individuals high in SDO eat meat not only because they enjoy the taste of it, but as an expression of their belief in social hierarchies and in human superiority over animals. These attitudes can be transmitted from parent to child through the socialization of infrahumanization (Costello & Hodson, 2012), through which animals' and humans' level of humanness is reduced. The interspecies model of prejudice (Costello & Hodson, 2012) demonstrates that human-human prejudices and human-animal prejudices are related to another. We posit that prejudice toward animals is a key component of carnistic beliefs.

Taken together, the reviewed studies demonstrate that derogating animals and meat consumption are related to prejudicial ideologies, and that some people eat animals as an expression of their support for group-based hierarchy. Carnistic beliefs may be related to how people interpret the meaning of eating animals; whereas for some the consumption of animals is related to taste or beliefs about nutrition, for those with strong carnistic domination beliefs meat eating may be an act of domination over animals.

The Present Research

The ideology surrounding meat consumption has been referred as carnism (Joy, 2009). Prior research has shown that people are motivated to defend their meat

consumption in order to reduce experienced dissonance in the context of eating animals (Bastian et al., 2012) and to defend the status quo (Dhont & Hodson, 2014). Eating animals is also associated with beliefs that rationalize (Piazza et al., 2015) and justify (Rothgerber, 2013) meat consumption. Moreover, some people eat animals as an expression of the support for group based hierarchy between humans and animals (Dhont & Hodson, 2014). Rothgerber's (2013) meat eating justification scale (MEJ) measures justifications in a number of categories, including justifications relying on belief in interspecies hierarchy, but relationships between justification categories were not systematically explored. Dhont and Hodson (2014) explore system-justifying beliefs about animals and belief in interspecies hierarchy, with a focus on their relationships for people who endorse right-wing ideologies. But to what extent are the two sets of carnistic beliefs statistically distinguishable (or indistinguishable), and how are they related to behavior toward animals (both killing animals and eating animals) and to prejudicial human-human attitudes?

In the present research we attempt to integrate prior empirical findings. We argue that the ideology of carnism is comprised of two coherent and distinguishable sets of beliefs. The first set of beliefs, which we refer to collectively as *carnistic defense*, is used to defend the practice of eating animals by legitimating meat consumption and denying animal suffering in the context of meat production. The second set of beliefs, *carnistic domination*, concerns the legitimacy of killing animals for their meat, by both derogating animals and endorsing human superiority over them. Therefore, we theorize that carnistic beliefs are both hierarchical and ideological.

We have developed a brief measure of carnism to be used to investigate the nature

of the ideology. We began with the development of a self-report measure of carnistic beliefs, the Carnism Inventory (CI). We tested its reliability (Study 1) and the hypothesis that carnistic defense and domination are indicators of the same underlying construct (Study 1). In Studies 2a and 2b, we examined the convergent, discriminant and known group validity of the CI. In Study 3 we investigated relationships between carnistic beliefs and prejudice, ideological human-human attitudes, and other social and political variables, to determine whether carnism can explain previous findings that relate eating animals with hierarchical ideologies.

Samples. According to prior works of measurement development (Brown & Ryan, 2003; Glick & Fiske, 1996), the present studies are presented thematically and by analytical techniques, rather than by sample, with each study section reporting data from multiple samples. Samples are described in Table 1. Sample A was comprised of undergraduate students recruited from a northeastern liberal arts university. Sample A completed demographic items, the CI, the Animal Rights scale (AR; Wuensch, Jenkins, & Poteat, 2002), the Animal-Human Continuity scale (AHC; Templer, Conelly, Bassman, & Hart, 2006), and the Social Dominance Orientation scale (SDO; Sidanius & Pratto, 1999). These measures were administered to allow us to conduct preliminary tests of convergent validity and to explore the feasibility of investigating relationships between the CI and sociopolitical variables.

Sample B was recruited from Amazon's Mechanical Turk, an online service that allows individuals to pay "workers" to complete short tasks. Sample B was compensated for their participation, and completed the CI and demographic items. This sample was recruited to collect more pilot data on the CI items. To evaluate the temporal stability of

the CI, we invited all participants from Sample B to participate in a second wave eight to nine weeks later. Those participants who chose to participate comprised sample B_R. Sample B_R completed the CI, demographic items, the Attitudes toward Animals Scale (AAS; Herzog, Betchart, & Pittman, 1991) the Interpersonal Reactivity Index (IRI; Davis, 1983), a measure of xenophobia, the RWA, and the Vegetarianism Threat scale (VT; Dhont & Hodson, 2014). Data from these measures were collected for additional tests of validity.

Sample C was comprised of undergraduate students from a northeastern liberal arts university. Sample C completed the CI, demographic items, the SDO, and AHC scales, the Right-wing Authoritarianism scale (RWA; Altemeyer, 1981), the Hostile Attribution Bias scale (HAB; Barefoot, Dodge, Peterson, Dahlstrom, & Williams, 1989), the Marlow-Crowne social desirability scale (Crowne & Marlowe, 1960), the Big-Five Index (BFI; John & Srivastava, 1999), and a measure of xenophobia (Van der Veer, Ommundsen, Yakushko, & Higler, 2011). These measures allowed us to conduct additional tests of validity, to investigate differences between the two CI subscales and other constructs, and to further investigate relationships between the CI and sociopolitical variables.

Sample D was recruited through Amazon's Mechanical Turk. Sample D completed demographic items, the CI, HAB and SDO scale, the Economic System Justification scale (ESJ; Jost & Thompson, 2000), the Ambivalent Sexism Inventory (ASI; Glick & Fiske, 1996), and the Symbolic Racism scale (SR; Sears & Henry, 2003). We collected these data to investigate relationships between the CI and sociopolitical variables, in particular prejudices toward specific social groups (i.e., Black Americans

and women).

Study 1: Construction and Reliability of the Carnism Inventory

Drawing on Joy's (2009) theory of carnism and prior research, we drafted pilot items corresponding to hypothesized categories of beliefs, including justifications (e.g., naturalness, normality, and naturality of eating animals) and cognitive mechanisms (e.g., the derogation of animals and the categorization of different species as edible or inedible). Carnistic defense items related to the naturalness ("Humans should continue to eat meat because they've been doing it for thousands of years"), normality (I've been eating meat my whole life, I could never give up"), dietary necessity of meat ("Eating meat is better for my health"), and the denial of animal suffering ("The production of meat causes animals to suffer"). We also drafted items that reflected carnistic domination of animals focusing on the derogation of animals ("Animals aren't intelligent enough to suffer in intensive confinement"), negative stereotypes about animals ("Animals are dirty and deserve to be eaten"), dominance ("Eating animals builds character"), and support for the killing of animals ("I have the right to kill any animal I want"). We constructed our measure with the following goals in mind: (a) it must measure both carnistic defense and carnistic domination beliefs, and (b) for pragmatic reasons, the final measure should be a short self-report measure.

We began with a large item pool and eliminated items on the basis of face validity, readability and clarity. The final item pool of 12 items was included in the exploratory factor analysis. 302 American undergraduate students (Sample A, Table 1) took part and indicated their agreement with each item on a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Results

Exploratory factor analysis. Study 1 was aimed at winnowing the initial item pool down to a short set of items that tapped carnistic defense and domination. With the data of sample A (Table 1), we conducted principal factor analysis with promax rotation in Stata 13 (Stata Corporation, College Station, TX, USA), using maximum likelihood parameter estimation. With a Kaiser measure of sampling adequacy of .83 and Barlett's test of sphericity highly significant we considered the factor analysis to have sufficient sampling adequacy. Two factors with eigenvalues > 1 emerged and inspection of the scree plot revealed a substantial drop between the second and third factor (eigenvalue: Factor 1 = 3.18, Factor 2 = 1.15, Factor 3 = 0.43). We eliminated items that showed high cross loadings on different factors ($>.45$) or low loadings ($<.45$) from the solution, resulting in a final scale with 2 factors and 8 items, corresponding to our theoretical constructs (Table 2). A defense factor (Factor 1, accounting for 55% of the variance) accounted for legitimations of eating meat and denial of animal suffering, and a domination factor (Factor 2, accounting for 20% of the variance), comprised of items expressing hostile and violent attitudes toward animals.. Two items referred to the suffering of animals, but each loaded on different factors. Item four ("*The production of meat causes animals to suffer,*" reverse-coded) loaded on carnistic defense and measures the belief that animal agriculture is humane, making it a viable defense of meat eating. Item eight ("*Animals aren't intelligent enough to suffer in intensive confinement*") is worded so as to derogate animals by minimizing their intelligence. Correspondingly it loaded more strongly on carnistic domination. Rather than reporting the exploratory analyses in detail, we present the Confirmatory Factor Analysis (CFA) of the Carnism Inventory (CI).

Confirmatory factor analysis. To verify that the two-dimensional factor structure of the CI supported our theoretical conceptualization of carnism, we conducted several confirmatory factor analyses (CFA). If the two factors of carnism are separate constructs, a one-factor model should account for the data significantly less well than the full model with one latent factor (carnism) and two second-order factors (defense and domination).

We performed a CFA of the full model using data from a national sample of 306 adults (Sample B, Table 1), using maximum-likelihood estimations with Stata 13 (STATA, StataCorp LP, College Station, Texas, USA). The fit indices for the full model with one latent factor (carnism) and two second-order factors showed a satisfactory correspondence with the sample covariance matrix (root mean square error approximation [RMSEA] = .033, comparative fit index [CFI] = .993, Tucker-Lewis index [TLI] = .989, standardized root mean square residual [SRMR] = .028), but this was not the case for the one factor solution (RMSEA = .178, CFI = .770, TLI = .678, SRMR = .092). To cross-validate the model, we tested the factorial model in a new sample of 173 university students (Sample C, Table 1). Again, the full model showed good fit indices (RMSEA = .048, CFI = .984, TLI = .975, SRMR = .044), whereas the one factor solution did not (RMSEA = .218, CFI = .32, TLI = .485, SRMR = .144). Factor loadings across the samples are reported in Table 2. As a final note, in all subsequent samples we confirmed the CI factorial structure. For brevity we do not further report these statistics.

Stability. The temporal stability of the CI was examined in sample B_R (Table 1). The CI scores from both waves were highly correlated, $r(101) = .84, p < .001$. Also, the

defense scores, $r_{(101)} = .83, p < .001$, and the domination scores from both waves, $r_{(101)} = .68, p < .001$, were highly correlated.

Scale characteristics. In Table 3 we report the scale characteristics of the CI and separately of defense and domination. The defense and domination factors were moderately correlated, $r_{(984)} = .39, p < .001$, for combined data of Samples A – D (meat eaters: $r_{(856)} = .33, p < .001$; vegetarians: $r_{(122)} = .44, p < .001$).

Discussion

The findings of Study 1 support the reliability of two distinct dimensions of carnism: carnistic defense, corresponding to legitimations of meat consumption and the denial of animal suffering and carnistic domination, corresponding to derogating and dominating animals in the context of meat consumption. While factor analyses indicated that these are two distinct factors, they were significantly correlated, and a model with two observed and one latent variable fit the data well. These results support our hypothesis that carnism is comprised of not just defensive beliefs, but of beliefs supporting human hostility toward animals as well. The strength of the relationships between scores on the CI scales measured at two different times indicates that these beliefs vary over time. An individual's scores on the CI scales likely reflect attitudes rather than states. This result could also indicate that participants experience some ambivalence around carnism, and particularly carnistic domination, which may result explain the lower temporal stability for that scale.

Study 2a: Discriminant and Convergent Validity

In Study 2a we sought to establish convergent and discriminant validity of the CI by investigating its relationships with other constructs. We expected both categories of

carnistic beliefs to be negatively associated with positive attitudes toward animals and support for animal rights. Carnistic beliefs are likely congruent with the belief that humans are unique and distinct from other animals, and we hypothesized that the CI would be negatively correlated with beliefs in animal-human continuity.

We included personality measures to test discriminant correlations with both CI scales. We expected that both CI scales would be unrelated to the Big Five Personality Characteristics (John & Srivastava, 1999) and to social desirability (Crowne & Marlowe, 1960) because while eating animals is a visible and socially accepted behavior, beliefs about doing so largely escape attention. We posit a bifurcated conceptualization of carnism comprised of both a defensive (carnistic defense) and a hostile element (carnistic domination). We hypothesized that empathy would differentiate between the two sets of carnistic beliefs. In line with these hypotheses, recent research has found that meat eaters report less empathy toward animals (Preylo & Arikawa, 2008) and show less activity in brain areas related to empathy when witnessing violence against animals and humans compared to vegetarians and vegans (Filippi et al., 2010). We also included a measure of the tendency to attribute others' behaviors to hostile motivations (Barefoot et al., 1989) and we predicted that carnistic domination would be negatively associated with empathy and positively correlated with hostility.

Method

Participants. Samples A - D are described in Table 1. Participants in all samples completed measures in a single session.

Measures. We asked participants to provide their age, sex, race, and education level, and we used the eight items of the Carnism Inventory (CI, Table 2) to measure

carnism. To test the CI's convergent validity, we administered the Animal-Human-Continuity Scale (AHC, Templer et al., 2006; e.g., "People evolved from lower animals"); the Animal Right Scale (AR, Wuensch et al., 2002; e.g. "God put animals on earth for man to use"), and the Attitude toward Animals Scale (AAS, Herzog et al., 1991; e.g., "Much of the scientific research done with animals is unnecessary and cruel"). Hostility was measured via the Hostile Attribution Bias scale (HAB, Barefoot et al., 1989; e.g., "I feel that I have often been punished without cause"), and empathy was measured with the Interpersonal Reaction Index (Davis, 1983; e.g. "I often have tender, concerned feelings for people less fortunate than me"). Social desirability was assessed with the Marlowe-Crowne Social Desirability Scale (SD, Crowne & Marlowe, 1960; e.g., "No matter who I'm talking to, I'm always a good listener"), and the Big-five trait taxonomy was used to assess global personality traits (John & Srivastava, 1999).

Results

For the analyses of the relationships between demographic variables and the CI we combined Samples A – D. In Sample A – D, carnistic domination was not significantly associated with demographic variables, but defense was negatively correlated with age, $r_{(953)} = -.11$ ($p = .001$). In samples B – D, only defense was negatively correlated with education level, $r_{(677)} = -.12$ ($p = .002$).

Convergent and discriminant correlations¹ between the two CI scales and other measures are provided in Table 4. As expected, the three scales that measured attitudes toward animals were negatively related to the CI scales. Participants higher on carnistic defense or domination scored significantly lower on the animal attitude scale than participants with lower scores on the CI scales. Moreover, they were less supportive of

animal rights and believed less strongly in animal-human continuity. Higher carnistic domination was significantly associated with higher hostile attribution bias and lower empathy, demonstrating the hostile character of carnistic domination. There was no relationship between these variables and carnistic defense. There was no significant correlation between the CI scales and social desirability, nor between the CI scales and conscientiousness, extraversion, or neuroticism. Participants higher in agreeableness were lower in carnistic domination. No relationship between agreeableness and carnistic defense was found. Participants higher in openness to experience had lower scores on the both CI scales.

Discussion

In Study 2a we presented evidence for the convergent and discriminant validity of the CI. The two CI scales were correlated with conceptual constructs as expected. Individuals with stronger carnistic beliefs did not support the belief that humans should respect the well-being of other species, did not believe in animal rights, and more staunchly believed in the divide between humans and animals (i.e. seeing humans as unique and superior to other species). The correlations between the CI and each of these variables were small enough to affirm that the CI represents a distinct construct with the exception of the high relation between the CI and the AAS. We address this point in Study 2b. The correlation between carnistic beliefs and animal rights (AR) are in the predicted direction, but domination was correlated less negatively with the Animal Right Scale than carnistic defense. While this pattern could be a sampling artifact, it could also indicate a broader pattern. Animal rights threaten the carnistic system and status quo, and are likely highly aversive to those high in carnistic defense. As the animal rights

described in the AR are mostly focused on animals used for clothing, research, or as pets, they may not be perceived to threaten people's ability to dominate animals by eating them, resulting in the lower correlation between carnistic domination and support for animal rights.

Results also supported the bifurcated conceptualization of carnistic beliefs as comprised of both a defensive and a hostile element. Participants higher in carnistic domination (the hostile component of carnism) were higher in hostile attribution bias. They were also lower in agreeableness and empathy, two variables that mitigate aggression (Dodge, 2006).

Study 2b: Criterion Validity

In Study 2b we sought to establish the known-group validity of the CI scales across two domains of carnistic behavior – eating meat and killing animals for their meat. In order to understand how carnistic beliefs facilitate meat consumption, we explored the relationships between the CI, meat enjoyment and meat-eating behavior. Meat enjoyment is indicated as the main motivation to eat meat (Lea & Worsley, 2003), and, not surprisingly, prior research has shown that meat-eating behavior is positively associated with meat enjoyment (Dhont & Hodson, 2014; Fessler, Arguello, Mekdara, & Macias, 2003). As carnistic defense is used to justify this practice, we hypothesized that individuals who ate more meat and derived more pleasure from it would be higher in carnistic defense. We also argue that enjoying meat but strongly rejecting carnistic beliefs would make it difficult to justify the decision to eat animals. Thus, we expected that carnistic defense would explain differences in meat consumption beyond meat enjoyment.

We investigated the relationship between carnistic beliefs and killing animals for their meat. We expected that participants who had slaughtered an animal for its meat would more strongly embrace carnistic domination beliefs as they justify violence toward animals. Finally, we further examined the high correlation between the Animal Attitude Scale (AAS) and the CI. We expected that the CI would better account for variation in the carnistic behaviors of eating and slaughtering animals than would speciesist attitudes assessed via the AAS.

Methods

Participants. In all samples together (see Table 1), there were 122 vegans and vegetarians (12%) and $N = 93$ participants indicated that they had butchered an animal for meat before (13.7%). To increase statistical power, we combined sample A – D ($N = 978$) for analyses of diet group as well as sample B – D for analyses of slaughtering group in Study 2b. We controlled for sample in all analyses.

Measures. As part of the demographic questionnaire participants indicated whether or not they eat meat or consume any other animal products (diet group: vegetarians and vegans = 0, meat eaters = 1). We also asked participants if they had ever personally slaughtered an animal as an indicator of violent behavior toward animals used for food (butchering group: 0 = not slaughtered, 1 = slaughtered an animal). In sample B, C, and D individuals reported how much meat they consume on an 8-point Likert scale ranging from 0 to 35 servings per week as a measure of the frequency of meat consumption. Two items developed by Dhont and Hodson (2014) were used to assess meat enjoyment on a 1 to 5 scale (sample B – D). These items measured how much participants like the taste of meat and how much pleasure they derive from consuming it.

Cronbach's alpha for the two meat enjoyment items was $\alpha = .92$. Carnism was measured with the eight items of the Carnism Inventory (CI, Table 1).

Results

The CI was strongly correlated with meat enjoyment ($r_{(682)} = .52, p < .001$) and moderately associated with meat consumption ($r_{(478)} = .37, p < .001$). Using partial correlations we explored each of the two CI scales' relationship with meat enjoyment and meat consumption, while controlling for the other scale. Defense was positively related to meat enjoyment ($r_{(682)} = .64, p < .001$) and to meat consumption ($r_{(478)} = .35, p < .001$). Domination was negatively related to meat enjoyment ($r_{(682)} = -.12, p = .002$), and not related to meat consumption ($r_{(478)} = .07, p = .110$). To further examine the negative partial correlation of domination and meat enjoyment, we analyzed this correlation for each diet group. For meat eaters, domination was negatively related to meat enjoyment ($r_{(595)} = -.09, p = .026$), while for vegetarians there was a positive but not significant correlation between domination and meat enjoyment ($r_{(81)} = .19, p = .084$).

Using multiple regression analyses, we examined possible differences between diet group (meat-eaters vs. vegetarians) and slaughtering group (slaughtered vs. not slaughtered) in the CI scales, meat enjoyment, and meat consumption after controlling for sample (see Table 5). Participants who identified as meat eaters had significantly higher scores on both CI scales, were higher in meat enjoyment and consumed more meat than vegetarians. Participants who had slaughtered an animal for meat had significantly higher domination scores than participants who had never slaughtered an animal. In addition, participants who had slaughtered an animal reported significantly more frequent meat consumption compared to participants who had not killed an animal. There were no

differences between slaughtering group in carnistic defense and meat enjoyment.

Because we hypothesized that eating animals is in part an ideological behavior, we analyzed predictors of diet and butchering group as well as meat consumption after controlling for sample (see Table 6): In a logistic regression model, carnistic defense and domination significantly predicted diet group after controlling for meat enjoyment and sample. The odds ratio of domination, however, indicated that individuals with lower scores on domination had a higher probability to be meat eater. A regression model regressing meat consumption on defense and domination indicated that domination, but not defense was a significant predictor of meat consumption after controlling for meat enjoyment and sample. Finally, a logistic regression predicting slaughtering group indicated that after controlling for meat enjoyment and sample, domination significantly predicted whether an individual had killed an animal, but defense did not.

Because of the high correlation between the CI and the AAS, we investigated the possibility that the CI would account better for variation in carnistic behavior than the AAS in sample B_R. We tested this possibility by conducting a number of regression models. A logistic regression model predicting diet group (meat eaters vs. vegetarians) indicated that carnistic defense was a significant predictor $OR = 89.81$, 95% $CI [5.03, 1604.04]$, while carnistic domination $OR = 0.17$, 95% $CI [0.02, 1.50]$, and the AAS were not, $OR = 3.64$, 95% $CI [0.19, 68.04]$, ($R^2_{\text{pseudo}} = .78$, $p < .001$). In a model predicting frequency of meat-consumption, carnistic defense was a significant predictor, $\beta = .34$, $p = .006$, but not carnistic domination, $\beta = -.13$, $p = .256$, or the AAS, $\beta = -.16$, $p = .236$, ($R^2_{\text{adj.}} = .13$, $p < .001$). A logistic regression model predicting animal slaughter indicated that domination, $OR = 1.63$, $CI [1.03, 2.58]$, but not defense, $OR = 0.73$, 95% $CI [0.43,$

1.23], was a significant predictor after controlling for the AAS, $OR = 0.56$, 95% CI [0.19, 1.64], ($R^2_{\text{pseudo}} = .10$, $p = .038$).

Discussion

Study 2b provides support for the hypothesis that meat-eating behavior is related to ideological values, namely carnism. As expected, our analyses showed that carnistic beliefs facilitate carnistic behaviors. Carnistic beliefs serve to justify not only eating meat, but also violence toward animals used for food.

Our findings demonstrate that carnistic beliefs play a unique role in predicting people's meat-eating behavior. Carnistic defense predicted meat consumption, while carnistic domination significantly predicted whether or not a participant had killed an animal for its meat. These results support the hypothesis that there are two distinct components of carnism: one dimension that defends meat consumption and a second dimension that supports the domination of animals through killing them. However, there were likely floor effects of domination for both diet groups, while there was only a floor effect of defense for vegetarians. Thus, the effect of diet group was larger on defense than on domination. There was a negative correlation between domination and meat enjoyment for meat eaters, and a positive, but not statistically significant, correlation for vegetarians. This correlational pattern could reflect a statistical artifact that was indicated by the non-intuitive negative effect of domination on the diet group (Table 6). Carnistic beliefs explained unique variance in carnistic behavior beyond meat enjoyment and beyond speciesist beliefs measured via the Animal Attitude Scale.

These results provide evidence that the CI scales and the AAS are psychometrically distinct constructs, and that the CI accounts for variance in behaviors directed

toward farmed animals that the AAS does not. Thus, the CI may be a more useful and precise measure for researchers exploring psychological processes related to meat consumption and other forms of carnistic behaviors than measures of speciesism.

Study 3: Carnism and Intergroup Attitudes

Having established the reliability as well as validity of the CI in the first two studies, we investigated possible associations between the CI and intergroup attitudes in Study 3. Previous research has shown that right-wing ideologies like SDO and RWA are related to meat-eating behavior (Veser et al., 2015). Dhont & Hodson (2014) have demonstrated that the belief that vegetarianism is a threat to one's country's social, political and economic stability is positively related to the frequency of meat consumption. We expected carnistic beliefs to be positively related to SDO and RWA, and hypothesized that individuals who justify the carnistic status quo will see vegetarianism as a threat to the carnistic system. In addition, we argue that carnism provides the legitimation and justification of the meat-eating status quo. We hypothesized that carnistic beliefs may serve system justification needs (Jost & Banaji, 1994) and expected that individuals with a strong need for system justification would be higher in carnistic beliefs in general.

Furthermore, we investigated possible associations between carnistic beliefs and prejudicial attitudes towards human minority groups, such as immigrants, women, and people of color. We anticipated positive correlations between prejudicial human-human attitudes and carnistic beliefs. In line with our hypothesis that carnism has both a defensive (carnistic defense) and a hostile (carnistic domination) component, we expected measures of prejudice to be more strongly correlated with carnistic domination

than carnistic defense. Finally, in light of recent studies on right-wing ideology and meat-eating behavior (e.g. Dhont & Hodson, 2014; Veser et al., 2015), we tested the hypothesis that carnistic beliefs mediate the relationship between carnistic behaviors (meat consumption and killing an animal for its meat) and SDO.

Method

Participants. Study 3 includes samples B_R, C, and D, who completed measures of sociopolitical variables in addition to the CI. Samples are described in Table 1.

Measures. Participants were asked to indicate their political orientation on a 1 to 5 scale, ranging from strongly liberal to strongly conservative. Right-wing ideologies and prejudicial human-human relations were measured with seven different scales (see Table 6). SDO measures one's preference for intergroup hierarchy (Pratto, Sidanius, Stallworth & Malle, 1994; Sidanius & Pratto, 1999; e.g., "some groups of people are simply inferior to other groups"), while RWA refers to a constellation of personality characteristics comprised of conservatism, authoritarian aggression and authoritarian submission (Altemeyer, 1981; e.g., "Obedience and respect for authority are the most important virtues children should learn"). Vegetarianism threat was assessed with a seven-item scale (Dhont & Hodson, 2014; e.g., "The rise of vegetarianism poses a threat to our country's cultural customs"). Xenophobia was also measured with a seven-item scale (Van der Veer, Ommundsen, Yakushko, & Higler, 2011; e.g., "Interacting with immigrants makes me uneasy"). The economic system justification scale was used to measure system justification needs (Jost & Thompson, 2000; e.g., "If people work hard, they almost always get what they want"), while sexism was assessed with the Ambivalent Sexism Inventory (Glick & Fiske, 1996; e.g., "Women seek to gain power by getting control over

men”), and racism with the Symbolic Racism 2000 Scale (Sears, & Henry, 2003; e.g., “Over the past few years, blacks have gotten more than they deserve”). Carnistic beliefs were measured with the CI (Table 1).

Results

Correlations among study variables. Table 7 presents the correlations of the study variables with the CI as well as partial correlations of carnistic defense and domination (correlations with one CI scale performed after controlling for the other)². The CI was significantly correlated with all study variables, but the two CI scales correlated differently with some of the variables. Individuals with higher carnistic domination scores were also higher in SDO RWA, xenophobia and economic system justification than were those higher in carnistic defense, supporting the hypothesis that carnistic domination represents more hierarchical ideological values. Further, carnistic domination was associated with benevolent sexism, hostile sexism, and symbolic racism, which suggest that carnistic domination function as an intergroup belief system. Carnistic defense was correlated with political conservatism while carnistic domination was not; there was also a significant relationship between carnistic defense and SDO, though this relationship was smaller than that between SDO and carnistic domination. Both scales were related to the belief that vegetarianism poses a credible threat to U.S. social norms and political stability.

Mediation models. Next, we tested the hypothesis that the relationships between SDO and meat consumption, as well as between SDO and having slaughtered an animal for meat, were mediated by carnistic beliefs after controlling for sample. To test the indirect effects in the mediation model, bootstrapping (1,000 resamples) was used to

provide bias corrected confidence intervals (Preacher & Hayes, 2008). We expected that the total effect of SDO on meat consumption and on having slaughtered an animal would be due to an indirect effect through carnistic beliefs. This was the case (see Table 7): we found significant direct effects of carnistic defense and domination on meat consumption as well as indirect effects of SDO via carnistic defense and domination. The direct effect of SDO on meat consumption was not significant indicating that the two categories of carnistic beliefs fully mediated the relation between SDO and meat consumption. We found significant direct effects of SDO and domination on animal slaughter as well as a significant indirect effect of SDO via carnistic domination. These results indicate that carnistic domination partially mediates the relationship between SDO and killing an animal for its meat.

Discussion

The findings of Study 3 supported our hypothesis that carnistic beliefs are associated with right-wing ideologies as well as prejudicial human-human attitudes. As expected, carnistic domination was related to prejudicial attitudes, but carnistic defense was not. We demonstrated that carnistic beliefs mediated the relationship between SDO and meat consumption, a pattern that was found in prior research (e.g. Dhont & Hodson, 2014). In addition, we found an indirect effect of SDO on having slaughtered an animal for its meat via carnistic domination. These findings demonstrate that the CI explains unique variance beyond SDO in both the eating and slaughtering of animals.

General Discussion

To date, little research has investigated the meat-eating majority's beliefs about meat consumption and the animals they eat. In the present article we present a novel

measure of these beliefs – collectively named carnism - and argue that consuming animal meat is related to this ideology, just as a plant-based diet is related to beliefs regarding veganism or vegetarianism (see Ruby, 2012, Ruby & Heine, 2012).

The aims of this project were to develop a brief instrument to measure carnistic beliefs and to begin investigating the relationships between carnism, the consumption of animals, and prejudice. To this end, we developed the Carnism Inventory (CI), comprised of two scales: carnistic defense contains items which provide justification for the practice of meat consumption as legitimate and just, while carnistic domination provide a rationale for the belief that animals are inferior beings who humans have the right to kill for their meat and contains hostile attitudes toward farmed animals. Results demonstrated that the CI was negatively associated with attitudes toward animals, including support for animal rights and the belief that humans are animals that evolved from other animals. As expected, carnistic domination was positively associated with hostile attribution bias and negatively correlated with empathy, demonstrating its hypothesized role as the hostile facet of carnism. In Study 2b we demonstrated the criterion validity of the CI, and found that carnistic defense was positively related to eating animals and to meat enjoyment, while individuals higher in carnistic domination were more likely to have killed an animal for their meat. Study 3 demonstrated that both carnistic defense and domination were associated with ideologies unrelated to animals, including RWA, SDO, xenophobia, and system justification. Both scales were also related to the perception of vegetarianism as a social and political threat. Unlike participants high in only carnistic defense, participants higher in carnistic domination had higher scores on measures of hostile sexism, benevolent sexism, and symbolic racism, suggesting that people who hold

prejudicial attitudes toward human out-groups also hold prejudicial attitudes toward animals. In addition, individuals who held negative attitudes toward Black Americans or women endorsed carnistic domination to a greater degree than those who did not, an indication of the discriminatory character of carnistic domination.

The Contribution of the Carnism Theory

The present research aimed to shine a light on attitudes held by the meat-eating majority, attitudes often taken for granted (Bem & Bem, 1970). Carnism is an important area of research not because it is deviant, but because it is so prevalent. The present research provides evidence that one of the most common human behaviors is not simply a gustatory behavior, as is widely believed, but also an ideological one. We further develop Joy's (2009) theory that carnism is a defense-oriented, system justifying ideology, and our findings demonstrate that eating animals is facilitated by two distinct sets of beliefs that are strongly related. While carnistic defense provides legitimations for meat consumption, carnistic domination concerns subjugating animals and physical violence against animals (i.e., killing an animal for its meat). The present research extends prior studies about the meat-paradox that have shown that because people care about animals they experience cognitive dissonance when thinking about eating them (Bastian et al., 2012; Loughnan et al., 2010). Our results showed a negative relationship between carnistic domination and empathy and suggest an additional hypothesis: some individuals do not empathize with animals, and therefore may not experience dissonance when they think about or actually engage in killing animals for food.

The associations between carnism, vegetarianism threat, and system justification support the theory that the adherents of the carnistic system are motivated to justify it.

Prior research has shown similar processes in other systems of racial or economic inequality (Jost, Banaji, & Nosek, 2004). Those who experience competing ideologies (like vegetarianism or veganism) that challenge their system as highly threatening might invest more cognitive effort into creating a coherent carnistic worldview than those who are not so affected by alternative ideologies. Because system justification is a strategy for reducing dissonance (Jost & Thompson, 2000), people who eat animals may benefit from endorsing legitimating myths embedded in carnism in order to reduce dissonance and to justify their behavior.

Dhont and Hodson (2014) showed that right-wing ideologies (RWA and SDO) predicted meat consumption and support for animal use through the belief in human superiority. Our findings suggest that not only are those high in right-wing attitudes motivated to eat animals to maintain unequal group relations, but that individuals high in carnistic domination eat meat more frequently independent of how much they enjoy it. For them, the act of eating animals may be motivated by ideology even more than taste.

Finally, our findings contribute to the understanding of the Interspecies Model of Prejudice (IMP, Costello & Hodson, 2012). The IMP describes prejudice as originating in negative or hierarchical attitudes toward animals and posits that perceiving animals as inferior to humans is a contributing factor to the development of perceiving human out-groups as inferior (Costello & Hodson, 2010; 2012). Results of Study 3 provide evidence that carnistic attitudes toward specific animal species (those that are eaten) are related to attitudes toward specific human social groups. These categorizations may constitute early forms of carnism and their development may still affect human perception of both human and non-human out-groups today. It could be argued that the evolved mechanisms for

evaluating the instrumental value of animals may have preceded or informed mechanisms for evaluating the utility of other humans.

Limitations and Future Directions

The current research was intended as a first step in understanding how carnistic beliefs facilitate the eating and killing of animals. We found that carnistic beliefs are related to prejudice toward human social groups. However, our research is limited by its correlational design. Experimental research that manipulates carnism is needed to establish causal directions in these relationships as well as to uncover the processes through which they function. More research is needed to understand the relationship between carnistic beliefs and the behavior of eating meat, and in particular, to understand the extent to which people eat meat because of their endorsement of carnism, or vice versa. Previous research has shown that people both derogate animals when they eat them (Bratanova et al., 2011; Bastian et al., 2012; Loughnan et al., 2014) and eat animals to derogate them (Dhont & Hodson, 2014). The CI was developed, in part, to be used as a tool to explore the relationship of these two patterns that correspond to carnistic defense and domination, respectively. Future experiments should test the hypothesis that carnistic defense is a consequence of meat consumption by those who enjoy eating meat, while carnistic domination drives people prejudiced against farmed animals to eat them.

The intrapersonal association between carnistic defense and domination is unclear. On the one hand, it is possible that individuals higher in carnistic domination embrace beliefs that defend meat consumption in order to justify the killing of animals that makes meat consumption possible. It is also possible that people higher in carnistic defense tend to endorse the subjugation of animals and deny moral worth to animals they

eat because they experience cognitive dissonance. More research is needed to understand the reasons for endorsing carnistic beliefs, and while socialization may appear the obvious answer, processes such as motivated cognition, preference for social hierarchy, and dissonance reduction also seem likely in light of the literature. But while considerable theoretical explanations of why people endorse carnism exist, these remain to be empirically tested.

While we believe that the construct of carnism is interesting in itself, we also believe that the Carnism Inventory may be a useful tool for researching ideology more broadly. As the public currently supports carnism, researching carnism presents an opportunity to investigate a hierarchical ideology while it is widely and explicitly endorsed. An essential next step in understanding carnism is to evaluate ways in which carnism is similar to prejudice toward human social groups. Adherents of prejudicial belief systems such as racism or sexism rarely identify themselves as racists or sexists; carnists, on the other hand, identify as meat eaters, though they may not recognize the ideological milieu in which this practice occurs. Therefore, researchers interested in how prejudice operates while it is still socially desirable may benefit from researching carnism, because participants who endorse carnism self-identify and likely do not face social pressure to moderate the expression of their beliefs. And because research has provided evidence that processes of moral disengagement play an important role in meat consumption (Graça et al., 2016; Haslam et al., 2012), carnism may be an effective lens through which personal involvement in structural or physical violence could be investigated, as carnism is a predictor of both the consumption of meat (the product of violence) and the actual and violent act of killing animals for their meat.

Conclusion

In the current research, we have introduced our theory of carnism and developed a brief measure to examine individual differences in embracing carnistic defense and domination beliefs. We believe that this research provides a possible explanation of how individual differences contribute to attitudes and behaviors toward animals used for food. As concern about animal welfare increases in the United States, carnism provides a means for understanding how the public thinks about animals used for food and might respond to ethical dilemmas surrounding meat production and consumption. Our findings provide evidence that meat consumption is facilitated by beliefs that defend carnistic behavior and justify violence against farmed animals. As such, carnism represents a core belief that underlies a pervasive human behavior and shapes a broad facet of human interactions with other species. Moreover, the current research suggests that carnistic beliefs are related to prejudicial attitudes. The relationship between SDO, carnism, and eating and killing animals suggests that carnism is a prejudicial ideology which supports discriminatory actions towards non-human animals. Future research is needed to understand how specific cognitive mechanisms operating in carnism relate to those present in other social attitudes. Such research may shed light on how prejudicial beliefs are maintained and translated into discriminatory behavior against out-group members, human and non-human alike.

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Footnotes

¹In Study 2a, female participants had significantly higher scores in the following scales AHC, AR, AAS, Empathy, neuroticism, and significantly lower scores in the HAB scale compared to male participants.

²In Study 3, female participants had significantly lower scores in the following scales SDO, ASI, SJE, and SR compared to male participants.

THE CARNISM INVENTORY

Table 1

Sample Characteristics

Characteristics	Sample				
	A	B	B _R ¹	C	D
N	302	306	102	173	203
Location	UM ^a	MT ^b	MT ^b	UM ^c	MT ^d
Age range (years)	18 - 67	18 - 69	21 - 61	18 - 75	18 - 66
Age <i>M</i> (<i>SD</i>)	25.5 (8.9)	33.8 (11.1)	35.9 (10.8)	27.0 (10.2)	35.3 (11.1)
Female (%)	75.2	42.6	54.5	67.4	50.3
Meat eater (%)	86.0	89.0	86.0	86.1	87.0
Ever Butchered (%)	-	15.3	11.9	8.1	15.8
Education <i>M</i> (<i>SD</i>)	-	3.55 (0.94)	3.87 (0.95)	3.58 (0.92)	3.73 (0.89)

Note. UM = Student Sample, University of Massachusetts, Boston; MT = General Adult Sample, Mechanical-Turk

¹B_R = Retest of the CI in sample B

^aUM, Winter, 2012; ^bMT, Winter 2014; ^cUM, Spring 2015, ^dMT, Spring 2015

THE CARNISM INVENTORY

Table 2

Factor Loadings for Carnism Inventory across Four Samples

Scale item	Sample			
	A	B	C	D
Carnistic Defense				
1) Humans should continue to eat meat because we've been doing it for thousands of years.	.73	.70	.83	.85
2) Eating meat is better for my health.	.73	.44	.84	.82
3) I've been eating meat my whole life, I could never give it up.	.68	.73	.70	.73
4) The production of meat causes animals to suffer ^a	.52	.60	.43	.30
Carnistic Domination				
5) Animals are dirty and deserve to be eaten.	.70	.65	.80	.91
6) Not eating animals is a sign of weakness.	.60	.73	.75	.84
7) I have the right to kill any animal I want.	.67	.68	.66	.78
8) Animals aren't intelligent enough to suffer in intensive confinement.	.61	.59	.58	.80

Note. The accompanying 7-point scale was 1 = *strongly disagree* to 7 = *strongly agree*.

^aReverse coded.

THE CARNISM INVENTORY

Table 3

Mean (SD) and Cronbach's Alpha of the Carnism Inventory in Four Samples

Sample	CI			Defense		Domination	
	<i>N</i>	<i>M (SD)</i>	α	<i>M (SD)</i>	α	<i>M (SD)</i>	α
A	302	2.95 (1.00)	.76	4.13 (1.47)	.76	1.78 (0.95)	.73
B	306	3.19 (1.23)	.83	4.14 (1.54)	.78	2.26 (1.35)	.82
B_R	102	3.00 (1.28)	.88	3.97 (1.69)	.87	2.03 (1.12)	.78
C	173	2.56 (0.93)	.77	3.69 (1.45)	.79	1.43 (0.80)	.78
D	203	3.27 (1.29)	.85	4.13 (1.48)	.78	2.41 (1.60)	.90

Note. CI = Carnism Inventory.

THE CARNISM INVENTORY

Table 4

Correlations of the Carnism Inventory (CI) and Subscales with other Scales with Mean (SD) and Cronbach's Alpha of the Scales in Sample A - D

Scale	Sample	N	Cronbach's α	M (SD)	Min - Max	Correlations		
						CI	Defense ^a	Domination ^b
AHC	A, C	475	.81	5.00 (0.98)	1-5	-.50***	-.26***	-.39***
AR	A	302	.88	0.35 (0.20)	0-1	-.51***	-.45***	-.16**
AAS	B _R	102	.92	3.41 (0.81)	1-5	-.71***	-.42***	-.41***
HAB	C, D	376	.75	1.32 (0.25)	1-2	.25***	-.07	.35***
Empathy	B _R	102	.90	4.59 (0.77)	1-7	-.13	.11	-.29**
SD	C	173	.79	1.50 (0.17)	0-1	-.03	-.08	.07
Agreeableness	C	173	.77	3.75 (0.64)	1-5	-.17*	-.01	-.22**
Openness	C	173	.75	3.84 (0.56)	1-5	-.21**	-.07	-.21**
Consciousness	C	173	.78	3.58 (0.42)	1-5	-.03	-.04	-.10
Extraversion	C	173	.87	3.21 (0.83)	1-5	.01	-.04	-.03
Neuroticism	C	173	.86	3.04 (0.87)	1-5	-.10	-.06	-.06

Note. CI = Carnism Inventory; AHC = Animal-Human-Continuity; AR = Animal Right Scale; AAS = Attitude toward Animals Scale; HAB = Hostile Attribution Bias; Empathy = Interpersonal Reaction Index; SD = Social Desirability.

^aCorrelations of defense after controlling for domination. ^bCorrelations of domination after controlling for defense.

*** $p < .001$, ** $p < .01$, * $p < .05$.

THE CARNISM INVENTORY

Table 5

Means (SD), and effect sizes of Diet and Animal Slaughter Group for the CI Scales, Meat Enjoyment, and Meat Consumption after Controlling for Sample

Dependent Variables	Diet Group					Animal Slaughter Group				
	Meat-eaters <i>M (SD)</i>	Vegetarian <i>M (SD)</i>	β	<i>p</i>	$R^2_{adj.}$	Slaughtered <i>M (SD)</i>	Not slaughtered <i>M (SD)</i>	β	<i>p</i>	$R^2_{adj.}$
CI ¹	3.25 (1.03)	1.88 (0.96)	.41	< .001	.17***	3.70 (1.32)	3.05 (1.11)	.20	< .001	.04***
Defense ¹	4.44 (1.25)	2.25 (1.23)	.51	< .001	.26***	4.47 (1.37)	4.14 (1.44)	.10	.012	.01*
Domination ¹	2.06 (1.27)	1.50 (1.04)	.15	< .001	.03***	2.93 (1.82)	1.96 (1.24)	.24	< .001	.06***
ME ²	4.34 (0.80)	1.73 (1.03)	.71	< .001	.51***	4.26 (1.05)	3.99 (1.19)	.08	.044	.01*
MC ³	1.87 (1.09)	0.45 (1.22)	.40	< .001	.16***	2.25 (1.36)	1.61 (1.17)	.17	< .001	.03***

Note. ME = Meat Enjoyment; MC = Meat Consumption, β = Standardized effect size of the regression analyses predicting the dependent

variables. ¹Samples A – D ($N = 978$); ²Samples B – D ($N = 676$); ³Samples B_R – D ($N = 475$)

THE CARNISM INVENTORY

Table 6

Predictors of Diet Group, Animal Slaughter Group, and Meat consumption after Controlling for Sample

	Meat Eater ¹			Meat Consumption ²			Animal Slaughter ³		
	<i>OR</i>	<i>95% CI</i>	<i>R</i> ² _{Pseudo}	β	<i>P</i>	<i>R</i> ²	<i>OR</i>	<i>95% CI</i>	<i>R</i> ² _{Pseudo}
Meat Enjoyment	6.14***	[3.88, 9.71]		0.40	< .001		1.19	[0.90, 1.56]	
Defense	2.34***	[1.49, 3.69]		0.08	.174		0.93	[0.74, 1.16]	
Domination	0.52***	[0.36, 0.76]		0.10	.019		1.53***	[1.31, 1.80]	
			.65***			.25***			.07***

Note. *OR* = odds ratio, *CI* = confidence interval, Meat Eater (0 = vegetarians, 1 = meat eater), Animal Slaughter (0 = no animal slaughter, 1 = animal slaughter). ¹Sample B, C, D (*N* = 676); ²Sample B_R, C, D (*N* = 478); ³Sample B, C, D (*N* = 681).

THE CARNISM INVENTORY

Table 7

Mean (SD) and Cronbach's Alpha of Study-Variables and (Partial)-Correlations of the CI with Study-Variables

Scale	Sample	N	Cronbach's α	M (SD)	Min - Max	Correlations		
						CI	Defense ^a	Domination ^b
CO	C, D	369		2.35 (1.14)	0 – 5	.20*	.17**	.05
SDO	C, D	376	.93	2.41 (1.19)	1 – 7	.48***	.13*	.45***
RWA	B _R , C	275	.94	3.11 (1.70)	1 – 9	.38***	.13*	.30***
Xenophobia	B _R , C	173	.93	2.49 (1.39)	1 – 7	.41***	.21***	.25**
ESJ	D	203	.83	4.45 (1.20)	1 – 9	.41***	.19**	.29***
VT	B _R	102	.88	2.01 (0.81)	1 – 5	.60***	.22*	.39***
BS	D	203	.84	3.94 (1.33)	1 – 7	.25***	-.03	.30***
HS	D	203	.96	3.54 (1.72)	1 – 7	.41***	-.05	.50***
SR	D	203	.79	2.28 (0.58)	1 – 4	.28***	.11	.20**

Note. CO = Conservatism; SDO = Social Dominance Orientation, RWA = Right-Wing Authoritarianism, ESJ = Economic System Justification, VT = Vegetarian Threat; BS = Benevolent Sexism, HS = Hostile Sexism, SR = Symbolic Racism.

^aCorrelations of defense after controlling for domination. ^bCorrelations of domination subscale after controlling for defense.

*** $p < .001$, ** $p < .01$, * $p < .05$.

THE CARNISM INVENTORY

Table 8

Direct and Indirect Effects of Carnistic Defense and Domination on Outcome Variables after Controlling for Sample

Unstandardized estimates	Meat Consumption		Animal Slaughter ^a	
	<i>B (SE)</i>	95% <i>CI</i> ^b	<i>B (SE)</i>	95% <i>CI</i> ^b
Total effect of SDO	.21 (.08)	[0.07, 0.35]	.33 (.08)	[0.17, .49]
Direct effect of SDO	-.00 (.06)	[-0.12, 0.12]	.21 (.10)	[0.01, 0.40]
Direct effect of Defense	.37 (.05)	[0.28, 0.47]	.20 (.21)	[-0.20, 0.61]
Direct effect of Domination	.14 (.07)	[0.01, 0.26]	.43 (.17)	[0.10, 0.76]
Indirect effect of SDO via Defense	.11 (.02)	[0.06, 0.15]	.03 (.03)	[-0.03, 0.08]
Indirect effect of SDO via Domination	.06 (.03)	[0.00, 0.12]	.10 (.04)	[0.03, 0.18]

Note. Data of Sample C and D, $N = 373$. An indirect effect is statistically significant if its confidence interval does not include zero. CI = Confidence Interval, SDO = social dominance orientation. All continuous variables were standardized.

^aAnimal Slaughter is a dichotomy variable. ^bPercentile 95% *CI*s for all direct and indirect effects were estimated using 1,000 bootstrap samples.