



Empirical: Single or Multiple Studies



A Matter of Preparation: Investigating the Differential Effects of Disassembling and Cooking on Meat-Related Perceptions and Conflict

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Supplementary Materials: Code, Data, Materials [see [Index of Supplementary Materials](#)]



Abstract

Food preparation plays a key role in shaping how people perceive meat: It helps people to dissociate meat from its animal origin and allows them to eat meat without experiencing conflict. However, experimental research in this area mostly disregards or confounds two food preparation steps: disassembling and cooking. To test how disassembling and cooking affect perceptions about meat dishes, we conducted secondary analyses of a sample of omnivores from a U.S.-representative dataset ($N = 1,189$). In this study, participants indicated meat perceptions (self-report) in response to a picture of one meat dish that varied in the degree of disassembling (i.e., whole parts vs. chopped/minced) and cooking (i.e., raw vs. cooked). Leveraging this experimental setup, multi-level analyses revealed that disassembling and cooking reduced compassion elicited by meat dishes. Disassembling also decreased general emotional arousal, while cooking reduced negative evaluations, conflict experiences in felt ambivalence, and specific negative emotions such as disgust and anger, while increasing valence perceptions more generally and the desire to eat the dish. Moreover, psychological network analyses showed that the relations of meat-related perceptions with each other do not differ significantly between food preparation steps. By offering nuanced insights into how food preparation affects conflict experiences as well as other affective and attitudinal meat-related perceptions, this research offers various theoretical and practical implications. We therefore discuss key considerations for future research on meat-related



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perceptions and identify when and which interventions may be most necessary and effective in encouraging reduced meat consumption.

Keywords

dissociation, meat perceptions, cognitive conflict, conflict avoidance, food preparation

Non-Technical Summary

Background

Many people enjoy eating meat, but if they are reminded that meat comes from animals, they often feel conflicted and uncomfortable. Researchers have thus suggested that people can avoid these conflicts and the resulting discomfort by mentally separating meat from its animal origin (they *dissociate* meat from the animal). Food preparation is one way that helps people do so because it disguises reminders of the animal origin, like blood or visible animal body parts. Thereby, food preparation arguably allows people to eat meat without feeling bad about it.

Why was this study done?

Previous studies provided initial evidence for the role of food preparation in this dissociation process. For instance, one study showed that people associated a beheaded, roasted pig in a picture with the animal less than they did a roasted pig with its head. Consequently, they experienced less empathy and disgust when seeing the former and were more willing to eat its meat and less likely to choose a vegetarian alternative. However, these studies did not clearly separate two important steps in food preparation: *disassembling* (like chopping or mincing meat) and *cooking* (typically involving a source of heat). In the present study, we therefore wanted to test how each step affects how people think and feel about meat.

What did the researchers do and find?

We showed 1,189 people from a representative U.S. sample a picture of a meat dish that varied in whether it was raw or cooked, and whole or disassembled. After seeing the image, we asked them about their emotional and attitudinal reactions to the dish and their desire to eat it. We found that:

- **When the presented meat dish was disassembled**, people reported feeling less emotionally aroused and less compassionate than if it were whole.
- **When the presented meat dish was cooked**, people reported thinking less negatively about the dish while having a more favorable general attitude toward it and a higher desire to eat it than if it were raw. In this vein, cooking meat also reduced how conflicted people felt about the meat dishes as well as how much disgust, anger, and compassion they experienced.

What do these findings mean?

How meat is prepared can change how people think and feel about it, and thereby their willingness to eat it. Our study shows that disassembling and cooking both play a role in the dissociation process, but they have different impacts on how people perceive meat. These nuanced insights could help researchers and practitioners figure out how and when to encourage people to eat less meat, in a way that is tailored to specific situations and thus more effective. This might help to promote the adoption of healthier, more sustainable, and more ethical diets.

Reducing meat consumption is essential for improving human health, protecting the environment, and promoting animal welfare (Godfray et al., 2018; Joy, 2011). However, many people are conflicted about eating meat (Bastian & Loughnan, 2017; Buttler & Pauer, 2024; Rothgerber, 2020). This is particularly evident in people's sensory perceptions of eating meat: On the one hand, people associate meat with a nice taste, tenderness and juicy texture; on the other hand, they associate it with a fibrous and chewy texture as well as fatty flavor and optics, often involving disgust when meat is associated with its animal origin, for instance, due to the visibility of blood in red meat (Font-i-Furnols & Guerrero, 2014; Kubberød, Ueland, Tronstad, et al., 2002; Michel et al., 2021; Ruby et al., 2016). Such negative sensory associations with meat are especially prevalent among women, younger people, and those who reduce their meat intake (Kubberød, Ueland, Tronstad, et al., 2002; Michel et al., 2021; Ruby et al., 2016).

When people become aware of such positive and negative perceptions about eating meat, they experience aversive conflicts about eating meat that can arise in the form of ambivalence before making decisions and in the form of dissonance after making decisions (Buttler et al., 2025). As a consequence, people actively cope with these conflicts, for example, by using motivated reasoning or by eschewing meat (Bastian & Loughnan, 2017; Rothgerber, 2020). Thus, people's experiences of ambivalence and dissonance are crucial in their transition towards meatless diets and the maintenance of meat-based diets (Bastian, 2019; Buttler et al., 2024).

Although meat-related conflict is a common experience (Buttler et al., 2023), people can passively avoid ambivalence and dissonance, which allows them to make and maintain decisions without feeling conflicted (Bastian & Loughnan, 2017; Buttler & Pauer, 2024; Rothgerber, 2020). A prominent way of doing so is by dissociating meat from its animal origin (Benningstad & Kunst, 2020). The most comprehensive test of this idea comes from Kunst and Hohle (2016), who, for example, manipulated the presentation of various meat dishes based on their degree of disassembly. In the first of five studies, they presented pictures of a full chicken (low disassembling), chicken legs or filets (medium disassembling), or minced chicken (high disassembling). Their results suggest that people dissociated meat from its animal origin more for high-disassembled dishes than low-

or medium-disassembled dishes. This, in turn, led to decreased empathy towards the slaughtered animal. In Studies 2a and 2b, they conceptually replicated and extended these results, showing that a whole roasted pork was dissociated more from its animal origin when beheaded. Again, this dissociation made people less likely to experience empathy towards animals and also disgust towards meat, which in turn increased their willingness to eat meat and decreased their willingness to eat vegetarian alternatives. In their subsequent studies, these dissociative processes were shown to occur less strongly when animals were presented beside meat advertisements and when animals and their suffering became apparent in the language used to describe meat and its production.

While there is initial evidence for the role of meat disassembling in dissociating meat from its animal origin, preparing meat is more complex than its degree of disassembling. The act of cooking, which often includes a source of heat (Lehrer, 1972), may serve a similar function as disassembling in dissociating meat from its animal origin. For instance, by changing the color of food (Fiddes, 1991), cooking may disguise associations with blood slaughter and death of animals (Twigg, 1979). Qualitative and correlational quantitative studies found that people (especially women) experience more disgust towards meat if it is red, not disassembled, raw, and includes blood or visible animal body parts (Kubberød, Ueland, Rødbotten, et al., 2002; Kubberød, Ueland, et al., 2006). An experimental study corroborated these findings, showing that cooked meat elicits less disgust compared to uncooked meat (Kubberød, Dingstad, et al., 2006).

However, in the experiment by Kubberød, Dingstad, and colleagues (2006), the cooked and uncooked dishes did not only vary in the degree of cooking but also the degree of disassembling: The uncooked dishes were not disassembled (raw full animal body parts), while the cooked dishes were disassembled (roasted and chopped meat dishes). Thus, it remains in question how cooking and disassembling contribute to these effects. Similarly, the studies by Kunst and Hohle (2016) remain inconclusive regarding the role of cooking because their studies included either manipulations of disassembling of either raw (Study 1) or cooked dishes (Studies 2a and 2b). Moreover, previous studies examined a small subset of specific meat dishes, neglecting the broad variety of meat-based meals that consumers commonly encounter. Consequently, our understanding of how meat preparation affects meat-related perceptions and especially meat-related conflict is still incomplete.

The Present Research

In the present research, we aim to improve our understanding of the role of meat preparation on people's perceptions of meat dishes more generally and conflict experiences specifically. While the work by Kubberød, Dingstad et al. (2006), as well as Kunst and Hohle (2016), has shown that disassembling and cooking might affect how people perceive meat, they confounded both factors or did not vary them. In the present study, we thus aim to investigate how cooking and disassembling affect meat dish perceptions and

meat-related conflict and whether cooking and disassembling have interactive effects. In line with the dissociation hypothesis, we expected that disassembling and cooking would decrease conflict experiences in potential ambivalence (i.e., the degree to which people hold similar and intense inconsistent evaluations about the dishes) and felt ambivalence (i.e., the meta-cognitive experience of conflict about the dishes; van Harreveld et al., 2015), compassion, and disgust. Moreover, we expected that disassembling and cooking would increase the desire to eat meat dishes, which serves as a proxy for behavioral intentions. To provide a more comprehensive overview of the effects of disassembling and cooking on the perception of meat dishes, we explored their effects on additional meat-related attitudes, including valence, familiarity, and palatability, as well as meat-related emotions, including anger and emotional arousal.

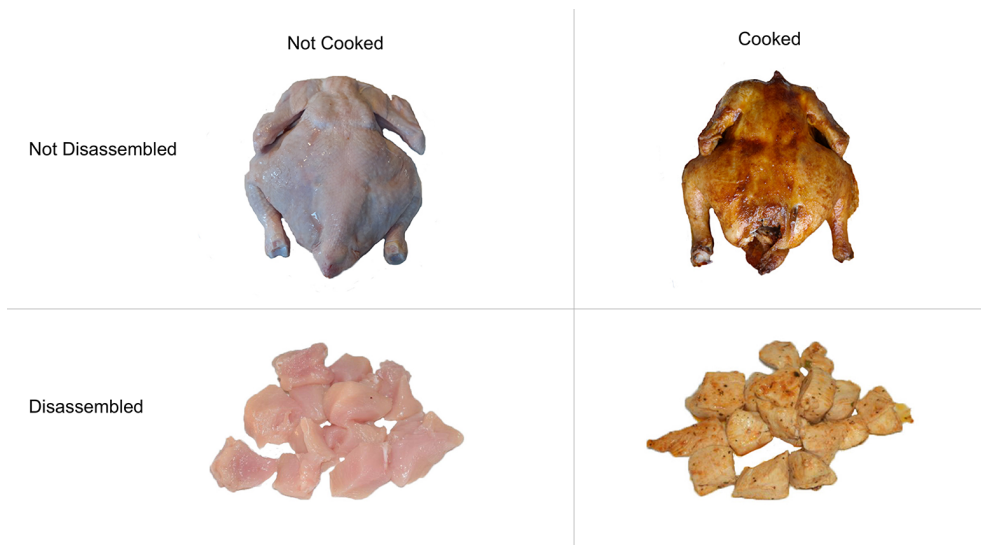
Method

In this study, we conducted secondary analyses on data from a representative sample from the United States (U.S.). This data taps into various meat-related perceptions elicited by one randomly selected picture of a meat dish that was either not disassembled or disassembled and not cooked or cooked (including all four possible combinations of these factors; see Figure 1). Not disassembled meat included dishes where the original texture of the meat is still present (e.g., broilers, chicken legs, or distinctive cuts), and disassembled meat included dishes where the original texture is not apparent anymore (e.g., chopped or minced meat and sausages or chicken nuggets; for a similar distinction, see Kubberød, Dingstad, et al., 2006; Kunst & Hohle, 2016). Cooked dishes included dishes that had already been heated (mostly roasted or baked), and not cooked dishes included raw dishes. The variation of cooking and disassembling in these dishes allows us to test their distinct effects and potential interactions on the perception of meat dishes.

We conducted the secondary analyses on data that we collected to validate the Trier Univalence Neutrality Ambivalence database (TUNA; Hahn et al., 2024). The original study was approved by the local ethics committee of the Trier University. The study's design and its analysis were not pre-registered. Below, we report all relevant measures and data exclusions. A full report on how the sample size was determined, a detailed description of the procedure and materials, and all collected measures are reported in the original study (Hahn et al., 2024). Supplemental materials (see Hahn et al., 2025c), data (see Hahn et al., 2025a), and analysis scripts (see Hahn et al., 2025b) used for the current project can be found on PsychArchives.

Figure 1

Depiction of the Independent Variation of Disassembling and Cooking in the Presented Pictures



Procedure

This sample was a subset of the data underlying the validation of the TUNA database sampled in 2021 (Hahn et al., 2024). This subsample contains participants who rated only one meat picture. This picture was randomly selected out of 130 (not) disassembled and (not) cooked meat pictures (see Figure 1). As such, the individual pictures were rated by multiple participants. Of the 130 meat images, 80 had at least one matched counterpart across the factor levels of (not) disassembled and/or (not) cooked. The remaining images depicted meats that typically exist in only one form, such as disassembled cold cuts, for which usually no not disassembled or not cooked equivalent exists. To keep the stimuli similar across factor levels, we included only the 80 matched images in our analyses, ensuring that perception differences can be attributed to the experimental variation of disassembling and cooking rather than uncontrolled stimulus properties.

Pictures were presented in the middle of the screen with the question and response option below the picture. Participants first answered dichotomous questions on familiarity and recognizability of the object displayed in the picture. Next, participants used a slider (ranging from 0 to 100 with endpoints labeled) to report their perceptions regarding emotional arousal, complexity, palatability, desire to eat the dish, anger, disgust, compassion, valence, as well as positivity, negativity, and felt ambivalence. The presentation of these questions was randomized, with the exception that valence always preceded

positivity and negativity, followed by felt ambivalence (see Figure S1 in the supplemental material for a schematic overview of the survey).

Positivity and negativity were used to calculate the similarity intensity model (SIM) index using the following formula: $(\text{Positivity} + \text{Negativity})/2 - |\text{Positivity} - \text{Negativity}|$ (Thompson et al., 1995) to indicate potential ambivalence (index range between -50 to 200). For ease of interpretation, we added 50 to the SIM index so that it ranged from 0 to 250, where 0 refers to no conflict in evaluations and 250 maximum conflict in evaluations. Table 1 provides an overview of variables included in our analysis. Zero-order correlations between all analyzed variables can be found in Table S1 in the supplemental materials.

Table 1

Overview of the Variables Investigated as Perceptions about Meat Dishes

Perception	Item Wording	Response Scale
Familiarity	Are you familiar with this object?	1 Yes 0 No
Emotional Arousal	When I see this object I experience an emotional arousal.	0 (Disagree) – 100 (Agree)
Anger	When I see this object I experience anger.	0 (Disagree) – 100 (Agree)
Disgust	When I see this object I experience disgust.	0 (Disagree) – 100 (Agree)
Compassion	When I see this object I experience compassion.	0 (Disagree) – 100 (Agree)
Palatability	This food is palatable.	0 (Disagree) – 100 (Agree)
Desire to Eat	I would like to eat this food right now if it were in front of me.	0 (Disagree) – 100 (Agree)
Valence	Evaluate this object.	0 (Very Negative) – 100 (Very Positive)
Positivity (no neg)	How <u>positive</u> is this object regardless of its negative aspects?	0 (Not Positive at all) – 100 (Very Positive)
Negativity (no pos)	How <u>negative</u> is this object regardless of its positive aspects?	0 (Not Negative at all) – 100 (Very Negative)
Felt Ambivalence	To what extent do you experience conflicting thoughts or feelings towards this object?	0 (Not at all Conflicted) – 100 (Maximally Conflicted)

Note. Positivity and negativity were used to calculate the similarity intensity model (SIM) index to indicate potential ambivalence. Complexity was not used in the further analyses as it is not a psychological outcome. Regarding familiarity and recognizability, we only included familiarity in our analyses due to the high conceptual overlap between both variables as indicated by the zero-order correlation ($r = .71$).

Participants

A total of 2,060 participants were recruited as a representative sample from the U.S. via Prolific. Due to incorrect responses to one of the attention check items, 17 participants were excluded. Additionally, because we only wanted meat eaters in our analysis, we excluded 132 participants who indicated that they followed a vegan or vegetarian diet.

To ensure that pictures were comparable across factor levels, only participants who rated pictures that had a match were included, resulting in a final sample of $N = 1,189$ ($M_{\text{age}} = 44.56$; $SD = 16.08$, range = 18–84 years). Figure S2 in the supplemental material presents a CONSORT-style diagram illustrating how the final sample was derived. Detailed demographic information for the final sample can be found in Table 2.

Table 2

Sample Characteristics for the Total Sample and the Subsamples Depending on Whether Participants Rated (Not)Disassembled and (Not)Cooked Dishes

Variable	Total	Not Cooked	Cooked	Not	
				Disassembled	Disassembled
Final N	1189(100%)	609(100%)	580(100%)	696(100%)	493(100%)
Gender					
Female	585(49.20%)	294(48.28%)	291(50.17%)	341(48.99%)	244(49.49%)
Male	592(49.79%)	309(50.74%)	283(48.79%)	350(50.29%)	242(49.09%)
Non-binary	12(1.01%)	6(0.99%)	6(1.03%)	5(0.72%)	7(1.42%)
Mage (SD)	44.56(16.08)	44.29(15.97)	44.84(16.21)	43.79(15.82)	45.63(16.4)
Occupation					
School	11(0.93%)	7(1.15%)	4(0.69%)	7(1.01%)	4(0.81%)
College/University	129(10.85)	64(10.51%)	65(11.21%)	77(11.06%)	52(10.55%)
Apprenticeship	5(0.42%)	0(0.00%)	5(0.86%)	4(0.57%)	1(0.20%)
Employed	680(57.19%)	353(57.95%)	327(56.38%)	405(58.19%)	275(55.78%)
Pensioner	132(11.10%)	68(11.17%)	64(11.03%)	67(9.63%)	65(13.18%)
Other	232(19.51%)	117(19.21%)	115(19.83%)	136(19.54%)	96(19.47%)
M political orientation (SD)	3.41(1.64)	3.37(1.65)	3.45(1.64)	3.4(1.66)	3.42(1.62)
left-right (Scale 1–7)					
Eating style					
Meat Eater (I regularly eat meat or fish)	1015(85.37%)	518(85.06%)	497(85.69%)	597(85.78%)	418(84.79%)
Meat Reducer (I try to rarely eat meat or fish)	174(14.63%)	91(14.94%)	83(14.31%)	99(14.22%)	75(15.21%)
Meat consumption					
Never	5(0.42%)	1(0.16%)	4 (0.69%)	2(0.29%)	3(0.61%)
Once per month	22(1.85%)	10(1.64%)	12 (2.07%)	15(2.16%)	7(1.42%)
Once per week	142(11.94%)	79(12.97%)	63 (10.86%)	83(11.93%)	59(11.97%)
Multiple times per week	663(55.76%)	341(55.99%)	322 (55.52%)	382(54.89%)	281(57.00%)
Daily	357(30.03%)	178(29.23%)	179 (30.86%)	214(30.75%)	143(29.01%)
Ethnicity					
Non-Hispanic White	846(71.15%)	428(70.28%)	418(72.07%)	494(70.98%)	352(71.40%)
Hispanic	76(6.39%)	43(7.06%)	33(5.69%)	48(6.90%)	28(5.68%)
Black or African American	149(12.53%)	71(11.66%)	78(13.45%)	80(11.49%)	69(14.00%)

Variable	Total	Not Cooked	Cooked	Not	
				Disassembled	Disassembled
American Indian or Alaska Native	2(0.17%)	1(0.16%)	1(0.17%)	2(0.29%)	0(0.00%)
Asian	86(7.23%)	49(8.05%)	37(6.38%)	54(7.76%)	32(6.49%)
Multi-Ethnic	22(1.85%)	11(1.81%)	11(1.90%)	13(1.87%)	9(1.83%)
Prefer not to answer	8(0.67%)	6(0.99%)	2(0.34%)	5(0.72%)	3(0.61%)

Note. Chi-square tests (gender, ethnicity, occupation, eating style) and *t*-tests (age, political orientation, and meat consumption) revealed that disassembling and cooking were indeed randomly distributed across participants as they were not significantly associated with any of the demographic variables.

Analyses

All analyses were conducted in R (R Core Team, 2013). We tested the direct effects of disassembling and cooking on the perception of meat dishes. To do so, we used separate maximum likelihood multi-level models (mixed-effect models) predicting the continuous variables outlined in Table 1. The models included disassembling (0: not disassembled, 1: disassembled) and cooking (0: not cooked, 1: cooked), and their interaction as predictors. To account for the non-independence of ratings due to the multiple evaluations of the same meat image across participants, we treated the specific meat dish (i.e., the images) as a level-two grouping variable with a random intercept. To account for potential confounding factors, we included demographic variables commonly associated with meat-related perceptions—namely gender, age, political orientation, eating style, and meat consumption—as covariates in the model (Buttler et al., 2024; Kubberød, Ueland, Tronstad, et al., 2002; Michel et al., 2021; Pfeiler & Egloff, 2018). To test for the significance of the predictor variables, we tested these models via analyses of variance applying the Satterthwaite's method. As we were interested in the individual effects of disassembling and cooking on these outcome variables (i.e., individual testing as compared to disjunction and conjunction testing), we did not correct for multiple comparisons (see Rubin, 2021).

While multi-level models shed light on how cooking and disassembling affect the perception of meat dishes on individual variables, we also wanted to examine whether cooking and disassembling affect how these perceptions are interrelated. Psychological network analysis is a data-driven approach that allows us to investigate how cooking and disassembling affect the associations between meat-related perceptions (Borsboom et al., 2021). This type of analysis provides a visually insightful representation of how different meat-related perceptions are interrelated. In psychological networks, observed variables are depicted as circles (i.e., nodes) and statistical relationships between these variables as lines (i.e., edges). Such edges are estimated with data and represent partial relations, that is, relations between variables after controlling for the effects of other variables in the

network. As such, network analysis can provide insight into unique relations between variables that cannot be explained by other variables in the network.

The networks in this study were estimated with the mgm model (mixed graphical models; Haslbeck & Waldorp, 2020), as this model allows for including continuous and categorical variables in the same network. This model estimates edges using regularized nodewise regression, meaning it calculates the relationships between each pair of nodes through regression analyses while controlling for all other nodes in the network and then applies regularization to remove weak edges in order to reduce the probability of false positive edges. Since the data are cross-sectional, edges represent conditional associations and not causal relations. An edge is included in the network if at least one of the two possible directions of relationships (from node A to B or vice versa) between nodes is selected. The interpretation of edges in a mgm network depends on the type of nodes involved: edges between two continuous nodes can be interpreted as partial correlations, and edges involving categorical nodes can be interpreted as (averaged) regression coefficients (Burger et al., 2023). Groups of nodes with a similar color represent communities of highly interrelated nodes as detected by a community finding algorithm.

Moreover, network analysis allows for comparing networks of different groups to examine whether meaningful differences can be observed, which allows for comparing the psychological networks of different conditions (i.e., cooked and not cooked; disassembled and not disassembled). Specifically, differences in network connectivity (i.e., the number and weights of edges between nodes) between networks from different groups are tested using the global strength metric, and differences in network structure (i.e., differences in edges between nodes) are tested using network invariance tests. Technical specifications of the R packages and their settings are provided in the supplemental materials S4.

Results

Multi-Level Modeling

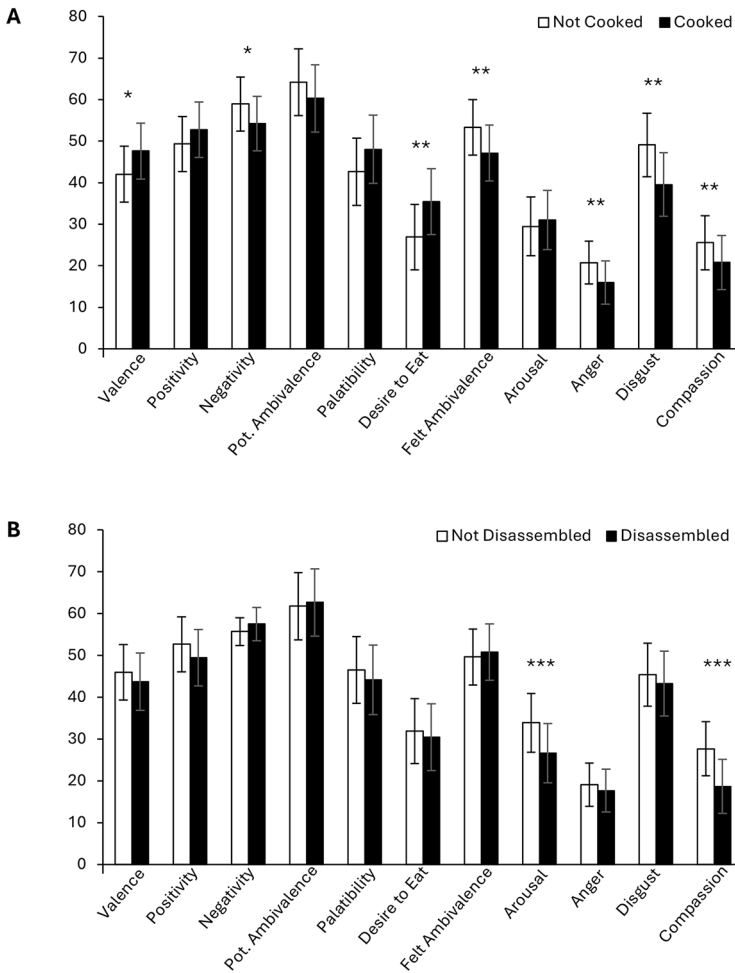
Cooking affected the desire to eat meat dishes directly ($F(1, 73.64) = 9.28, p = .003, \omega_p^2 = .10$), suggesting that cooking increased the desire to eat meat dishes (see Figure 2). Cooking also positively predicted valence ($F(1, 76.06) = 4.17, p = .045, \omega_p^2 = .04$), and negatively predicted negativity ($F(1, 75.92) = 4.71, p = .033, \omega_p^2 = .05$), felt ambivalence ($F(1, 77.64) = 9.84, p = .002, \omega_p^2 = .10$), anger ($F(1, 75.30) = 11.11, p = .001, \omega_p^2 = .12$), disgust ($F(1, 76.09) = 10.87, p = .002, \omega_p^2 = .11$), and compassion ($F(1, 1178) = 9.12, p = .003, \omega_p^2 = .01$).¹ This suggests that cooked meat dishes elicited more desire to eat it, was

1) The multi-level model for compassion indicated a singular fit, suggesting negligible variance attributable to the grouping factor “meat picture”. Consequently, we simplified the model to a standard linear regression without random effects, being justified by the lack of evidence for meaningful variation in the grouping factor meat picture.

evaluated more favorably and less negatively, and it reduced conflict experiences as well as specific emotions in anger, disgust, and compassion than not cooked meat dishes (see Figure 2A).

Figure 2

Estimated Marginal Means for Perception of Meat Dishes Depending on the Factors Cooking (Panel A) and Disassembling (Panel B)



Note. Error bars denote 95% confidence intervals around the estimated marginal means.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

In contrast, disassembling did not affect the desire to eat meat ($F(1, 73.90) = 0.29, p = .593$). However, disassembling negatively predicted more general emotional arousal ($F(1, 77.64) = 12.89, p = .001, \omega_p^2 = .13$) while also negatively predicting compassion ($F(1, 1178) = 25.87, p < .001, \omega_p^2 = .02$). This suggests that disassembled meat elicited less general emotional arousal and compassion (see [Figure 2B](#)). There were no significant interactions between disassembling and cooking (all $ps > .12$). Statistical parameters for these models and estimated marginal means can be found in Tables S2 and S3 in the supplemental materials.

Network Analyses

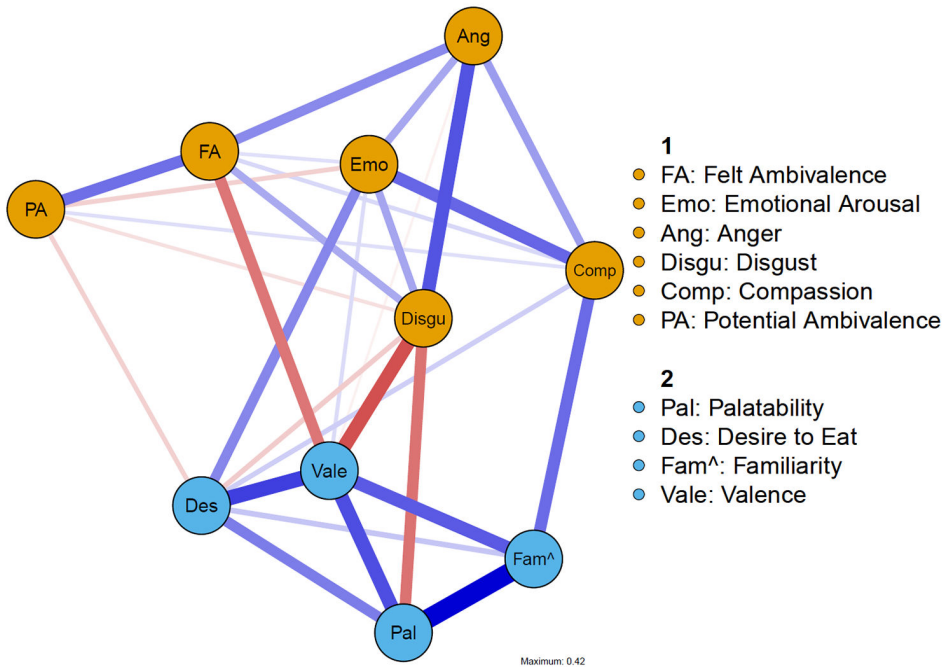
The network of the total sample ($N = 1,189$) is depicted in [Figure 3](#) (see [Table A1](#) in the [Appendix](#) for all edges in the network and [Table S4](#) for results of edge accuracy and difference analyses). The orange community (#1) mainly encompassed *emotions* and consisted of compassion, emotional arousal, anger, disgust, felt ambivalence, and potential ambivalence. The blue community (#2) encompassed aspects of *appetite*, consisting of the desire to eat the meat dish and attitude aspects (palatability, familiarity, and valence). This distinction in communities suggests that the desire to eat the meat dish—as a proxy for behavioral intentions—is more strongly related to variables related to appetite than to variables related to emotions.

Specifically, the desire to eat meat dishes was positively related to valence (edge weight = .32), palatability (edge weight = .21), emotional arousal (edge weight = .20), familiarity (edge weight = .09), and compassion (edge weight = .08). These results indicate that, on average, higher scores on these variables tend to co-occur with a stronger desire to eat the meat dish and vice versa. Conversely, the desire to eat meat dishes was negatively related to disgust (edge weight = -.08) and potential ambivalence (edge weight = -.08). This indicates that, on average, more disgust and potential ambivalence tends to co-occur with less desire to eat the meat dish and vice versa. Taken together, these results suggest that higher disgust and conflict experiences (in the form of potential ambivalence) might, in fact, be related to reduced meat consumption, while higher valence, palatability, emotional arousal, and compassion are presumably related to higher meat consumption.

Figure 3

Network Depicting the Relations Between Perceptions of Meat Regarding All Presented Dishes

Total



Note. Blue edges represent positive and red negative relations. For the binary node (^), a positive relationship indicates a higher probability for Category I of the binary node (i.e., being familiar with the depicted dish) if the other increases and vice versa. Edge width and color density correspond with the strength of the relations (see Table A1 in the Appendix for corresponding edge weights).

Network Comparison

Network comparison tests showed no significant difference in the global strength of the networks between the cooked and not cooked ($S = 0.26$, $p = .52$) or the disassembled and not disassembled ($S = 0.21$, $p = .58$) networks. Results from a network invariance test were also not significant (cooked and not cooked: $M = 0.25$, $p = .12$; disassembled and not disassembled: $M = 0.18$, $p = .54$). In sum, the networks of relations *between* perceptions related to meat do not seem to be affected by the degree of disassembling and cooking of the different types of meat dishes.

Discussion

Food preparation arguably helps people to dissociate meat from its animal origin (Benningstad & Kunst, 2020). This can be considered a passive way to avoid the experience of conflict towards meat (Bastian & Loughnan, 2017; Buttlar & Pauer, 2024; Rothgerber, 2020). Although food preparation is complex, previous research mostly manipulated disassembling, not cooking, to investigate the effects of meat preparation or confounded both factors (Kubberød, Dingstad, et al., 2006; Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018). This study aimed to provide more nuanced insights into the distinct roles of meat disassembling and cooking on its perception by independently varying disassembling and cooking. To do so, we analyzed a sample of omnivores from a large U.S.-representative dataset that tapped into the perception of various pictures of meat dishes that were either not disassembled, disassembled, not cooked, or cooked (including all possible combinations; Hahn et al., 2024). This approach enabled us to generalize our findings across a wide array of dishes compared to previous work, which relied on a small subset of stimuli that mainly included one dish per study.

We first assessed how disassembling and cooking directly affect the perception of meat dishes via multi-level modeling. As expected in light of the dissociation hypothesis (Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018), both factors negatively predicted compassion, indicating that disassembled and cooked meat led to decreased compassion. However, both factors had different effects on other meat-related perceptions: On the one hand, disassembling meat led to a decrease in general emotional arousal; on the other hand, cooking meat decreased felt ambivalence, specific emotions such as anger or disgust, and negativity; it also increased more favorable evaluations of meat and the desire to eat the meat dish. This might suggest that cooking is even more impactful in terms of its consequences on the perception of meat dishes than disassembling and might be the primary way meat preparation helps to avoid conflict experiences (Bastian & Loughnan, 2017; Buttlar & Pauer, 2024). Nonetheless, both affected compassion elicited by meat, supporting the idea that disassembling and cooking both lead to a dissociation of meat from its animal origin. Interestingly, however, there were no interactions between cooking and disassembling, which suggests that cooking and disassembling affect meat-related perceptions independently of each other.

Thus, we assessed whether cooking and disassembling affect the relationships *between* different perceptions about meat dishes to investigate whether distinct mechanisms underlie these effects. However, psychological network comparison tests revealed that disassembling and cooking did not significantly impact how these perceptions were interrelated, suggesting that the system of psychological processes underpinning these perceptions function comparably regardless of preparation state of the meat dish. In line with the literature, a heightened desire to eat meat was accompanied by decreased disgust and potential ambivalence, which were also related to decreased felt ambivalence (Buttlar et al., 2023). Based on this, we argue that conflict experiences are crucial to

how food preparation as a passive conflict avoidance strategy may affect people's desire to eat meat. For instance, cooking meat could decrease disgust (as indicated in the multi-level analyses), thereby increasing the desire to eat meat while simultaneously reducing conflict experiences (both directly and indirectly, as indicated by the network). Future research should investigate these pathways in more detail to allow more causal inferences about the interplay of these meat-related perceptions.

The findings offer implications for both researchers and practitioners interested in the psychology of meat consumption and preparation. For researchers, the distinct effects of cooking and disassembling call for refined theories that distinguish these two aspects of food preparation rather than treating them as interchangeable; it also means that when studying the consequences of meat-related perceptions, it is crucial to cautiously select the given stimulus material. The TUNA picture database (Hahn et al., 2024) offers researchers a freely available tool, including an accompanying desktop app, for selecting validated stimulus material based on complex attitudes and a variety of meat-related perceptions. These visual stimuli will allow for theory-driven research on how food preparation affects meat-related perceptions.

For practitioners, our findings provide insights into how the depiction of meat may influence people's meat-related perceptions and behaviors in interventions aiming to promote more healthy, ethical, and sustainable diets by highlighting its connections to animals (Kwasny et al., 2022; Mathur et al., 2021). In particular, we outline how visual aspects of meat preparation affects consumer perception of meat and, thereby, arguably their decision-making. This allows practitioners to judge when interventions may be particularly useful in promoting meatless food choices. Based on our findings, we argue that people are especially attracted by visual depictions of cooked meat, such as in pictures on advertisements, packaging, or on restaurant menus. While it is often not an option to present uncooked meat in such situations, cooked meat may be presented in other ways to highlight its animal origin. To this end, studies have demonstrated that displaying images of animals alongside recipes or pictures of meat can increase conflict experiences and diminish the intention to consume meat (e.g., Kunst & Hohle, 2016; Tian et al., 2016). Similarly, a field study has shown that activating animal welfare values can reduce the actual ordering of burgers in a fast food restaurant (Bouwman et al., 2022). Counteracting dissociative effects may encourage reduced meat consumption or a shift toward plant-based diets.

Limitations and Future Research

Our research offers nuanced insights into how food preparation influences people's perceptions of meat. In line with the dissociation hypothesis (Benningstad & Kunst, 2020), we replicated findings that show that food preparation reduces disgust and compassion and increases the desire to eat the meat dish (Kubberød, Dingstad, et al., 2006; Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018) and additionally showed, in line

with the theory, that food preparation indeed affects people's attitudes towards meat and conflict experiences (Bastian & Loughnan, 2017; Buttlar & Pauer, 2024). While we assume that these effects arise because people dissociate meat from its animal origin due to food preparation, the dataset on which we based our secondary analysis did not directly measure this dissociation process. To corroborate our findings, future work that builds on the present research should incorporate this measure and test the meat-animal dissociation as a mechanism for these effects more directly.

Surprisingly, emotional arousal and compassion were positively related to the desire to eat the meat dish in both zero-order correlations and network analysis, which indicates that higher emotional arousal and compassion tend to co-occur with a stronger desire to eat meat dishes and vice versa. These unexpected results might stem from the fact that these variables were assessed using rather general wording (see Table 1). That is, we did not specify whether the emotional arousal referred to positive or negative arousal; and the compassion item was without explicit reference to whom the compassion was directed. As such, these items might be interpreted heterogeneously across participants. For instance, emotional arousal may also be understood as the positive excitement related to eating a (tasty) meat dish, while compassion may not only incorporate compassionate feelings towards (slaughtered) animals but also reflect sympathy for others, as in the context of a family dinner. Future research should thus consider measuring emotional arousal as negative emotional arousal to reflect the aversive conflict, which is hypothesized to co-occur with cognitive conflict (Buttlar et al., 2025); it should also measure compassion directly in regard to animals, as compassion is especially suggested to decrease meat consumption if it is related to animal suffering (Benningstad & Kunst, 2020).

While the effects of our experimental variation of disassembling and cooking on meat-related perceptions were the main focus of our analysis, some limitations of the cross-sectional investigations on the relation *between* meat-related perceptions should be acknowledged. First, the relationships between variables are undirected. That is, higher meat-related disgust, for example, might have led to a lower desire to eat meat dishes; however, a lower desire to eat meat dishes might also have led to increased disgust ratings. Thus, directionality, such that disgust reduces meat consumption, may only be inferred from previous literature (e.g., Becker et al., 2022), but cannot be made from the data itself. Moreover, as relations between nodes are conditional on other nodes, the inclusion of nodes in a network might affect the results. Thus, our results depend on the perceptions of meat that were assessed in our study. While we think that the networks in this study provide a holistic overview of relevant meat-related perceptions and their relation to behavioral intentions, future research might uncover additional variables that shape people's perceptions of meat as a function of disassembling and cooking and its effects on meat consumption.

Constraints on Generality

In our study, we only visually presented the meat dishes to participants. Such visual impressions of meat are important, for instance, when people decide whether to buy packaged meat in the supermarket. In these situations, our findings may shed light on how cooking and disassembling affect the visual appearance of meat and, thereby, consumer perceptions and decisions. However, how meat is perceived is often also influenced by its smell, flavor, and texture (Font-i-Furnols & Guerrero, 2014; Kubberød, Ueland, Tronstad, et al., 2002; Michel et al., 2021; Ruby et al., 2016). This limits the generalizability of our findings, as it may be less applicable in situations where the desire to eat meat is not only elicited by the visual appearance but also by the smell of meat, for instance, when observing a meat dish on a neighboring table in a restaurant before deciding what to order. Although it is more challenging to test how these variables influence meat-related perceptions, studies would provide a more comprehensive perspective on how meat preparation affects people's perception of meat.

In this vein, it is worth noting that disassembling did not directly affect the desire to eat meat, as would be expected based on the findings of Kunst and Hohle (2016). In their studies showing these effects (Studies 2a and 2b), the authors manipulated disassembling by presenting participants with a roasted pig with or without its head. In contrast, despite depicting a broad variety of meat dishes, none of the disassembled dishes presented in the present research depicted an animal with its head. This might imply that only very apparent reminders of the animal origin might affect people's desire to eat meat, and less apparent disassembling does not suffice to do so (e.g., from distinctive cuts to minced meat). This effect might be partially driven by people's familiarity with meat because they are usually less familiar with meat dishes consisting of whole animals (Possidónio et al., 2022). To this end, experimental research has shown that meat disassembling, which hides its animal origin, affects people's appetite for visual depictions of meat mostly when meat dishes are unfamiliar but not when they are familiar to them (Possidónio et al., 2022). In line with this explanation, 78% of the participants in our research indicated that they were familiar with the dish. This familiarity might consequently have assuaged the effects of disassembling on the desire to eat meat. Thus, while we already depicted a broad variety of meat dishes, the current investigation might be extended by the addition of whole animals. This latter point might be especially important given the cultural variation in meat consumption.

While our data comprised omnivores drawn from a representative sample, this sample only represents omnivores from the U.S., and the effects of disassembling and cooking might differ in other cultural contexts. For instance, Kunst and Palacios Haugestad (2018) demonstrated that food disassembling helps people from Ecuador and the U.S. to dissociate from its animal origin, which decreased empathy and disgust but increased their willingness to eat meat in favor of a vegetarian alternative. Yet, these effects seem to be less strong the more often people are exposed to not disassembled meat, which

varies across both cultures. As such, people from the U.S. seem to dissociate more than people from Ecuador. Thus, future research should try to uncover boundary conditions that moderate the effects of disassembling and cooking on the perception of meat dishes, especially in cross-cultural investigations.

Conclusion

How meat dishes are perceived is a matter of preparation. In this study, we show that food preparation decreases compassion, partially supporting the dissociation hypothesis (Benningstad & Kunst, 2020). These effects on compassion elicited by meat were present for different meat preparation steps, including disassembling and cooking. Yet, cooking and disassembling seem to have distinct effects, as disassembling mostly seems to affect general emotional arousal, whereas cooking seems to affect the desire to eat meat, meat-related attitudes, felt ambivalence, and specific emotions of disgust and anger. This way, the present investigation provides insights into how food preparation may serve as a passive conflict avoidance strategy and affect people's desire to eat meat.

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Ethics Statement: The local ethics committee of Trier University approved the original study.

Data Availability: Data (see Hahn et al., 2025a) and analysis scripts (see Hahn et al., 2025b) are available on PsychArchives.

Supplementary Materials

For this article, the following Supplementary Materials are available:

- Data (see Hahn et al., 2025a)
- Analysis scripts (see Hahn et al., 2025b)
- Supplementary materials (see Hahn et al., 2025c)

Index of Supplementary Materials

Hahn, L., Buttler, B., & Chambon, M. (2025a). *Dataset for: A matter of preparation: Investigating the differential effects of disassembling and cooking on meat-related perceptions and conflict* [Data]. PsychArchives. <https://doi.org/10.23668/psycharchives.21193>

- Hahn, L., Buttler, B., & Chambon, M. (2025b). *Code for: A matter of preparation: Investigating the differential effects of disassembling and cooking on meat-related perceptions and conflict* [Analysis scripts]. PsychArchives. <https://doi.org/10.23668/psycharchives.21194>
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Appendix

Table A1

Significant Edge Weights of the Overall Network Between Perceptions of Meat Dishes

Variable	1	2	3	4	5	6	7	8	9	10
1. Palatability		.21		.42			-.23		.29	
2. Desire to Eat				.09	.20		-.08	.08	.32	-.08
3. Felt Ambivalence					.05	.19	.14	.06	-.23	.24
4. Familiarity								.24	.27	
5. Emotional Arousal						.14	.15	.25	.06	-.08
6. Anger							.28	.16	-.02	
7. Disgust									-.29	-.05
8. Compassion										.05
9. Valence										
10. Potential Ambivalence										



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