

Motivated Reasoning Behind Dietary Choices

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Abstract

This study focused on the different aspects underlying the meat paradox, which illustrates the discrepancy between individuals' desire to avoid harming animals, while keep consuming meat. It investigated how persuasive communication and dietary preferences shape this phenomenon, while also examining the role of individual motivational reasoning and social influence. Furthermore, the study examined the moderating effect of gender on the relationship between dietary preferences and persuasive communication. Using an online questionnaire, this study tested two hypotheses with a final sample size of 75 participants, primarily first-year students of the University of Groningen. Within this sample, 21 participants were omnivores, 33 were flexitarians, 5 were pescetarians, and 16 followed a plant-based diet (i.e., vegans and vegetarians). The results were analyzed through an ANOVA, revealing that meat eaters found the message less convincing, indicating a higher motivation for meat-eaters to morally disengage compared to non-meat eaters. Additionally, a marginal effect of gender on the selfish dependent variable was found. Future research should replicate this study with a larger sample size to validate these findings. Moreover, investigating the impact of threatening persuasive text on meat eaters could provide valuable insights into behavior change strategies.

Keywords: meat paradox, moral disengagement, persuasiveness, selfishness, prosocial, meat-eaters, vegetarians and vegans

Motivated Reasoning Behind Dietary Choices

For as long as we know, meat has been a crucial part of the human diet, since it is a source of protein, fat and essential micronutrients (Muchenje et al., 2018). While meat has its nutritional benefits, it also presents several challenges. First, concerning human health, research has shown that high meat consumption is linked to an increased risk for chronic diseases, such as obesity, hypertension, type 2 diabetes, stroke and colorectal cancer (Mathur et al., 2020; Moosburger et al., 2023; Cynthia & Ashley 2023). Second, from an environmental perspective, meat production significantly contributes to greenhouse gas emissions, accounting for 72-78% of all greenhouse gas emissions in the agricultural sector (Moosburger et al., 2023). These emissions arise at all stages of the food production cycle, from the farming process itself, through manufacture, distribution and retailing, to storing and cooking food at home (Kustar & Patino-Echeverri, 2021). Lastly, as the global population grows, and the demand for meat increases (Godfray et al., 2018), tensions are emerging in the meat industry. Despite the industry's growth, concerns about animal welfare are also on the rise (Hemsworth & Coleman, 2011). To put this in perspective, millions of animals worldwide – ranging from fish and cows to chickens – are slaughtered every day (Our World in Data, 2023). In summary, this background underlines why it is crucial to raise awareness regarding the human health, environmental, and ethical considerations associated with a meat-based diet.

Self-Serving Moral Disengagement

Despite growing awareness about the environmental impact of animal farming and ethical concerns regarding animal treatment, there is no sign that meat production is slowing down (Godfray et al., 2018), or that a substantial number of people are changing their diets in meaningful ways (Garnett, 2013). How is it possible that people seemingly keep consuming meat while – theoretically – being fully aware of the consequences? This phenomenon is

known as the meat paradox. This paradox describes the situation where people consume meat while also wanting to avoid harming animals (Bastian & Loughnan, 2017). It points out the discomfort that arises from the mismatch between one's beliefs and actions (Sarah et al., 2021), showing our natural tendency to maintain a positive self-view. One expression of this paradox is the self-serving bias, wherein individuals shield themselves from having to update their preconceived values and beliefs (Bandura, 1999).

Before delving into the implications of the meat paradox, it is crucial to investigate the mechanisms fueling its existence. First, the paradox can be examined from a broader perspective, considering the potential influence of social norms. These norms represent the unspoken rules that guide our behavior and have a significant influence due to the social judgments associated with following or ignoring them (Hogg & Reid, 2006). This influence is particularly significant when individuals feel uncertain about what the appropriate behavior within their reference group is (Higgs, 2015). One could argue that following perceived norms is self-serving because it helps individuals avoid social disapproval and maintain a positive self-image. Informational social influence illustrates this, showing how our perceptions of what and how much we eat are shaped by the beliefs we form based on information gathered from our reference group (Robinson et al., 2014). Additionally, when individuals are exposed to outside threats to the self, their self-serving biases may become activated (Campbell & Sedikides, 1999). Research further indicates that information from in-group members has a more substantial impact on attitudes and behavior compared to information from out-group members (Hogg & Turner, 1987; Hogg & Smith, 2007). This tendency to conform to social norms to fit in with the group highlights an interesting dynamic. When applied to the meat paradox, a tension arises: individuals might follow social norms related to meat consumption even when they are aware of the possible negative effects. This interplay between the self-serving bias and social norms demonstrates how both factors work together to shape behavior.

While illustrating the influences of social norms on the meat paradox, it is equally important to examine the influence of individual behavior as well. Graça and colleagues (2016) note that in highly routinized behaviors like meat consumption, moral perception is often hindered, meaning individuals may not recognize a conflict until the consequences of their behavior become salient. When this behavior becomes salient, individuals tend to either show a willingness to try to repair and minimize this damage or be motivated to justify and defend their behavior. One reason for considering the last option is that if the individual chooses to let go of the behavior, it may involve considerable perceived costs for the self.

When a situation with a strong initial preference towards a particular situation occurs, motivated reasoning drives the individuals' cognitions into the desired decision (Kunda, 1990). Graça and colleagues (2016) add that when individuals consume meat, they might become emotionally attached to it. While being emotionally connected, they might ignore the moral concerns about meat. A consequence could be that when individuals are asked to think about the ethical consequences of consuming meat, they might feel threatened that they could lose something they care about. To avoid this kind of cognitive dissonance, individuals use directional reasoning to distance themselves from these moral concerns when consuming meat. Through directional reasoning, individuals can downplay the impact of their actions and choices by self-servingly concluding that their actions are, e.g., normal and necessary, and thus disengage from any (moral) implications of their actions. This effectively serves as a strategy to cope with the cognitive dissonance induced by having the consequences of meat consumption made salient to them (Bandura, 1999; Kunda, 1990). These motivational-cognitive mechanisms are likely a significant factor in why individuals stick to a meat-based diet and why the meat paradox exists in the first place (Romein, 2019). Building upon the discussion of cognitive dissonance and its role in meat consumption, recent research by Camilleri et al. (2020) sheds further light on the mechanisms underlying individuals' dietary

choices. Their study explored the interplay between animal empathy, moral disengagement, and meat consumption, revealing interesting insights into the psychological processes that are involved. Their research revealed that moral disengagement mediates the relationship between animal empathy and meat consumption. Specifically, the findings indicated that low animal empathy was associated with higher levels of moral disengagement and increased meat consumption. Consequently, they advocate for a reorientation within psychosocial strategies focused on reducing global meat production. They propose that this focus needs to shift towards reducing moral disengagement, achievable through increased animal empathy or alternative mechanisms.

In conclusion, understanding how individual beliefs, social norms, and moral disengagement influence the meat paradox is crucial. It highlights the importance of research into the role of cognitive processes, such as those leading to moral disengagement, in shaping individuals' dietary choices and its implications for promoting sustainable dietary habits on a global scale.

Gender

Apart from the stable human tendencies that underlie the self-serving bias and its consequences, individual differences, such as gender, may play a significant role in the relationship between dietary choices and moral disengagement. Meat is often considered to be a 'masculine' food type, while dairy products, fruits, and vegetables are typically labelled as 'feminine' (Rosenfeld, 2020). Research suggests that these attitudes could be rooted in upbringing (Klaudia et al., 2020). Moreover, historically, meat-consumption was predominantly associated with social elites, dominated by men, thereby linking it to gender-based power dynamics (Adamczyk et al., 2023).

It is interesting to note, as observed by Díaz (2016), that there are differences in attitudes towards attachment to animals between men and women. Women seem to be more

likely to attribute human-like qualities to animals than men. However, this evidence was the strongest related to the use of animals (food production, entertainment and work), and there were no intersex differences found in relation to moral perceptions of animals in relation to adopting a plant-based diet. However, Michel et al. (2021) did find intersex differences regarding behavior towards meat. Their primary research outcomes showed that women show a greater awareness of animal suffering regarding meat consumption, and men tend to prioritize taste when justifying meat consumption. Research of Dowsett et al. (2018) adds to these findings that men were more likely to make use of 'the four N's' of justification for meat consumption, which include; normal, natural, necessary and nice. Additionally, men often justify their meat consumption based on religious or naturalistic arguments, or they simply deny its association with animal suffering. This behavior circles back to the phenomenon of moral disengagement, as discussed by Graça et al. (2016). Hinrichs et al. (2022) contribute to these findings by highlighting that men tend to feel higher levels of defensiveness towards a plant-based diet compared to women. Besides that, they suggested that this defensiveness and negative affect towards a plant-based diet are largely shaped by social context. Therefore, as they conclude, the tendency for men to show defensiveness towards a plant-based diet may be partially explained by negative affect. This could be associated with a greater tendency to perceive reduced meat consumption as a threat and a limitation to personal freedom, thus increasing the likelihood of employing moral disengagement tactics, such as justifications favoring meat consumption.

The Present Study

Given the growing demand for plant-based diets and the ongoing need to understand the factors influencing dietary choices, this study addresses the central question: Does the salience of moral implications of meat consumption predict moral disengagement? To investigate this question, the study formulated the following hypotheses:

Hypothesis 1: People who consume meat will be motivated to morally disengage from the consequences of meat consumption, if it is made salient. This effect does not occur for people who do not consume meat.

Hypothesis 2: The effects in H1 are moderated by gender. Specifically, males will exhibit stronger self-serving reasoning tendencies compared to females.

Method

Participants

The sample consists of 75 participants who completed the study online. Participants were recruited via Sona Systems (Sona Systems, n.d.) and convenient sampling. The participants were undergraduate first-year students from the University of Groningen (28 male, 45 female, 2 non-binary, and 2 other). Of the 75 participants, 21 were omnivores, 33 were flexitarians, 5 were pescetarians, and 16 followed a plant-based diet (i.e., vegans and vegetarians). The minimum age for participation was 18 years. Participation was voluntary, and all participants signed informed consent forms and were rewarded with 0.4 credits if recruited via Sona Systems. The study was approved by the ethical committee of the Department of Psychology at the University of Groningen (study code: PSY-2324-S-0259).

Materials and Procedure

The study is a cross-sectional survey study that focuses on between-subject measurements. For data collection, participants completed the study online via the Qualtrics XM platform, and for data analysis, we employed JASP statistical software. The questionnaire began with a short explanation of the study, followed by an inquiry to attain participants' informed consent. The participants were then asked to specify their dietary preferences and habits.

Measures of Dietary Choice

Participants were asked to indicate their dietary habits, which serve as the independent variable. The first one asked, “How would you describe your current diet?”. Participants could choose between “My meals (almost) always include meat”, “I balance meat and vegetarian options”, “Fish is my only source of meat” and “Plant-based (mostly vegetarian or vegan)” Those participants that chose either the first or the second option were redirected to the second and third items. The second item asked how many days a week participants are consuming meat products, on a 7-point Likert scale ranging from 1 day to 7 days a week. Lastly, we used a 5-point Likert scale to assess the question “Do you make efforts to reduce your meat consumption?”, with answer options ranging from ‘absolutely no efforts’ to ‘significant efforts.’

Measures of Cognitive Reflection

The cognitive engagement was measured through a 6-item adaptation of already existing cognitive reflection tests. All items were designed with the intention in mind that an intuitive but wrong answer gets triggered in the participants which actively needs to be overwritten. An example item goes as follows:

You are faced with two trays each filled with white and red jelly beans. You can draw one jelly bean without looking from one of the trays. Tray A contains a total of 10 jelly beans of which 2 are red. Tray B contains a total of 100 jelly beans of which 19 are red. From which tray should you draw to maximize your chance of drawing a red jelly bean?

A: Tray A (correct answer)

B: Tray B

Participants could score between 0 (no items answered correctly) and 6 (all items answered correctly).

Measures of Moral Disengagement

Due to the difficulty in directly measuring moral disengagement, we operationalized moral disengagement by measuring the author's perceived motives and the persuasiveness of the arguments given in the text. The text was strategically designed to allow participants to form their own beliefs based on two key aspects: 1) the author's motive, which could either be perceived as selfish or prosocial, and 2) the persuasiveness of the three arguments related to environmental concerns, moral concerns and health concerns. These arguments were stated as facts, without specifying their source, allowing participants to interpret these arguments independently.

We measured the first dependent variable, the inferred author motives, by using a bipolar scale ranging from -3 to +3 with the help of six items adapted from Müller et al. (in preparation). Three of those items tested for altruistic motives of the author (e.g. "The author wants to communicate facts to the public"), with a Cronbach's alpha of $\alpha = 0.66$. The other three items tested for selfish motives (e.g. "The author wants to protect their personal interests"). The Cronbach's alpha for the selfish motives measure was acceptable at $\alpha = 0.71$. The second dependent variable, perceived persuasiveness of the arguments given in the text, was measured through the use of a six-point Likert-type scale. We measured perceived persuasiveness for environmental concerns ("Plant-based diets are better for the environment"), moral concerns ("Plant-based diets prevent animal suffering"), and health concerns ("Plant-based diets are better for your health"), respectively, each ranging from "Not convincing at all" to "Very convincing". The Cronbach's alpha for this measure was $\alpha = 0.60$.

Demographic Measures

In the final section of the questionnaire, demographic information was collected (gender with the answer options 'male,' 'female,' 'non-binary,' and 'other' and political orientation, with answer options ranging from 'extremely left-wing' to 'extremely right-wing') and a debriefing on the purpose of the study was given in text format.

Gender

Only two participants (2.3%) chose the ‘non-binary’ option, and another two participants (2.3%), chose the ‘other specified’ option out of the total sample ($N = 75$). Given that these combined groups are negligibly small compared to the total sample, it was decided to exclude the categories ‘non-binary’ and ‘other specified’ from the analysis. However, it is important to note that this exclusion only applies to the hypothesis testing the effect of gender.

Dietary Levels

Dietary levels were grouped into two categories: meat-eaters, and non-meat eaters. The first group includes individuals who identified as ‘meat-eaters’, ‘pescetarians’, and ‘flexitarians’. The second group consists of those who identified as ‘vegetarians/vegans’. The two groups are separated during this analysis by contrasts which can be found in the appendix. This was done to clearly distinguish between people who eat meat and those who do not.

Results

Preliminary Analysis

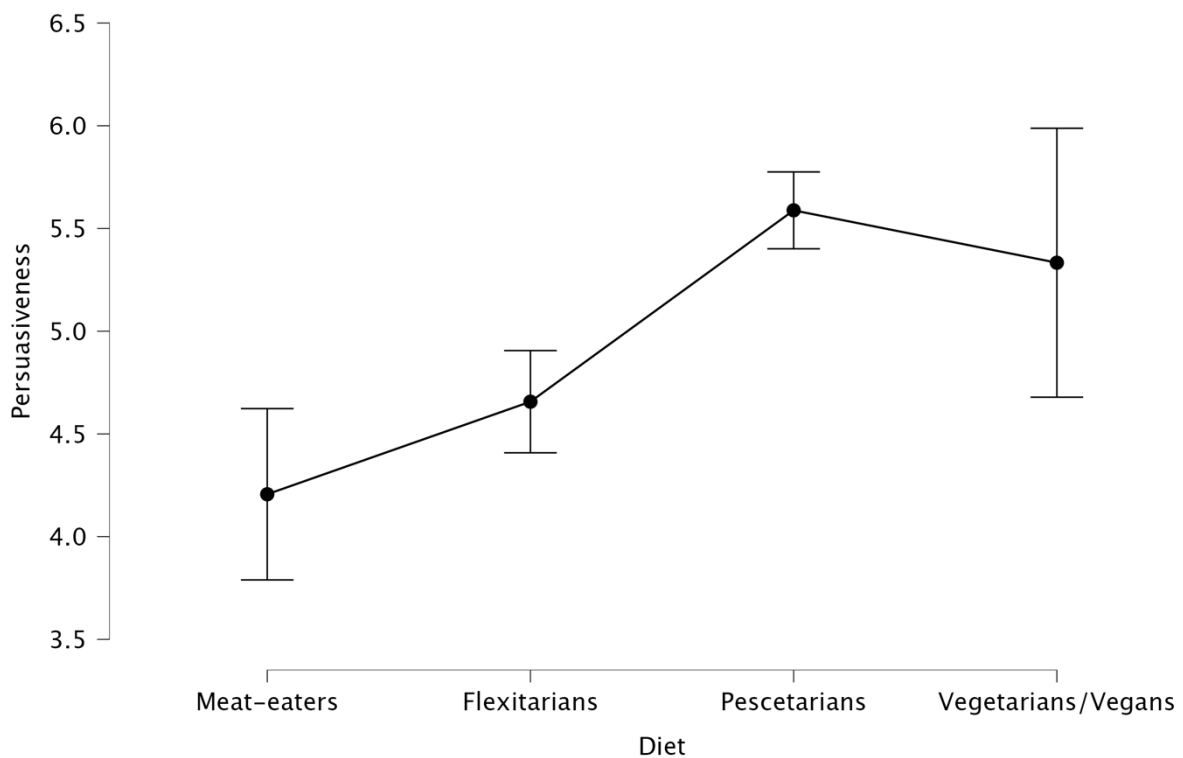
As a first step in the analysis, assumptions were checked for each variable. The independence of the observations was ensured by the study design. The normality of the residuals was verified for each dependent variable using Q-Q plots and the Shapiro-Wilk test. There was non-normality within the variables, but we nevertheless proceeded with the analysis due to a shortage of time to gather more participants. Additionally, Levine’s test was performed to test the homogeneity of the variances of the dependent variables, following significant results for all the dependent variables; Persuasiveness ($p = 0.004$), Selfishness ($p = 0.012$) and Prosocial ($p = 0.044$). However, we still proceeded with the ANOVA since this is still the best fit for this analysis. Table 1 presents Pearson’s correlations for the most

significant variables that are being used in this analysis. These correlations are crucial for identifying potential relationships between the variables.

Hypothesis Testing

To investigate Hypothesis 1 and 2, an ANOVA was conducted which included the dependent variable Persuasiveness, the independent variables Diet and Gender, and the interaction effect. To create clarity, we decided to exclude the categories ‘non-binary’ and ‘other specified’ from the Gender variable, given that these combined groups are negligibly small compared to the total sample. Following this, Gender was dummy-coded (Tables 2 and 3). The dietary levels were dummy-coded as well: meat-eaters, and non-meat eaters (Tables 4 and 5). The first group includes individuals who identified as ‘meat-eaters’, ‘pescetarians’, and ‘flexitarians’. The second group consists of those who identified as ‘vegetarians/vegans’. The full model is in Table 6.

The first hypothesis states that people who consume meat will be motivated to morally disengage from the consequences of meat consumption if it is made salient. The ANOVA test showed a significant effect, indicating differences between the dietary groups in the extent to which they were persuaded by the author ($F(2,61) = 17.62, p < .001, \eta_p^2 = 0.37$). As could be seen in Figure 1, meat eaters generally scored lower on persuasiveness compared to vegetarians/vegans. This indicates that meat-eaters were less convinced by, and thus morally disengaged from, the arguments that were presented in the text, suggesting that Hypothesis 1 is supported.

Figure 1*Descriptives plots: Persuasiveness and Diet*

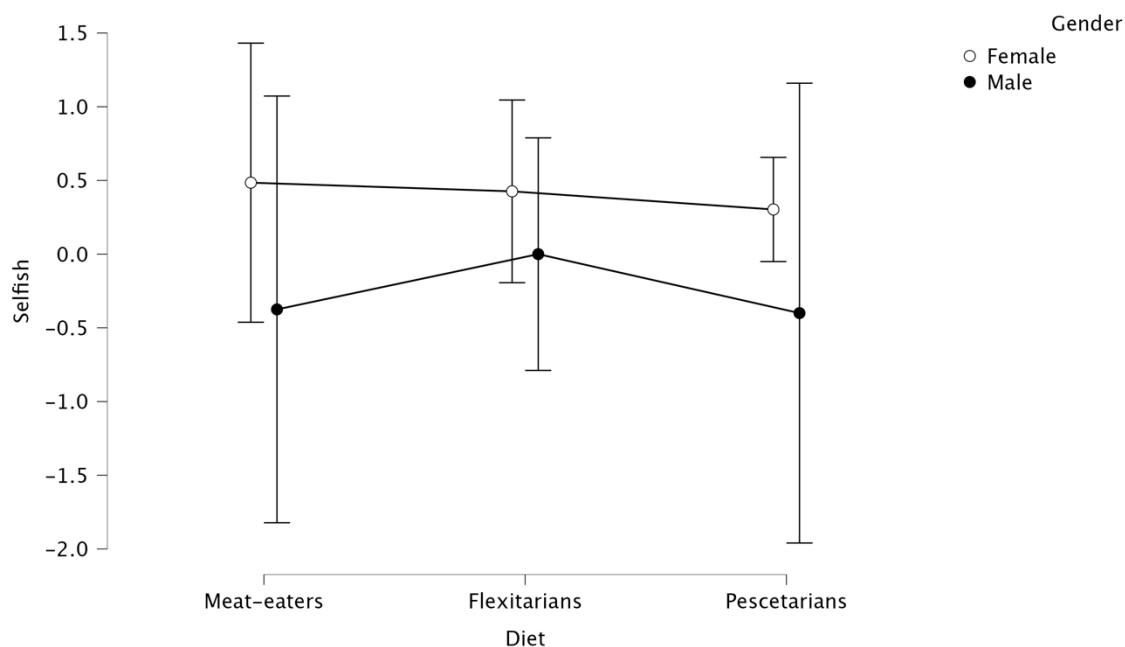
Exchanging the dependent variable for either of the author's motives measures did not show significant effects (see Tables 7 and 8), suggesting no differences between the dietary groups in the extent to which they infer prosocial, or selfish motives, in the author. This suggests that regardless of their dietary preferences, participants tended to view the author similarly. This finding may suggest that factors other than the motive of the author play a more significant role in shaping motivation behind dietary preferences.

The second hypothesis examined whether gender moderates the effect observed in Hypothesis 1. Unfortunately, as shown in Table 9, there were fewer than two male participants in the 'vegetarians/vegans' category. Since ANOVA analysis requires at least two participants per condition, this category had to be excluded to complete the ANOVA analysis. Focusing on the results, a marginally significant effect was found for the selfish dependent variable on gender (Table 8) ($F(1,60) = 3.84, p = 0.06, \eta_p^2 = 0.06$). Figure 2 illustrates that

females generally attributed more selfish motives to the author, with meat-eating females showing the highest levels ($M = 0.49$). In contrast, males, particularly those identifying as flexitarians showed minimal attribution of selfish motives, with a very small mean value ($M = -2.31 \times 10^{-11}$). These findings suggest that gender does influence how participants perceive the selfish motives in the author, however, this result is not strong enough to draw robust conclusions.

Figure 2

Descriptives plots: Selfish



However, no significant effect was found for the interaction effect between gender and diet on selfishness. Additionally, there were no significant effects of gender or the interaction effect on the persuasiveness and prosocial dependent variables (see Tables 6,7 and 8). This suggests that these variables might not have influenced how persuasive participants found the arguments or the extent to which they perceived the author as prosocial.

Discussion

This study explored the relationship between dietary preferences and motivated reasoning, forming two hypotheses before conducting this research. The first hypothesis

stated that individuals who consume meat would be motivated to morally disengage from the consequences of meat consumption when these are made salient, whereas this effect does not occur for vegetarians/vegans. After the analysis, a significant effect between dietary preferences and persuasiveness was found. The second hypothesis investigated whether gender moderates the effect of the first hypothesis. The analysis revealed a marginally significant effect between gender and selfishness.

The significant effect found for the persuasiveness dependent variable indicates that dietary habits can influence how individuals respond to persuasive communication. Specifically, those who follow a vegetarian/vegan diet are more likely to find arguments promoting reduced meat consumption convincing. This finding suggests that prior dietary preferences shape the perception and interpretation of persuasive messages, supporting the idea that people shape their own realities based on personal biases. Moreover, this research supported the idea that perceived persuasiveness of the arguments correlates with moral disengagement. If moral disengagement were not a factor, meat-eaters might have found the message persuasive. Conversely, there was no significant effect found for the prosocial and selfish dependent variable, indicating that these variables did not influence how participants interpreted either prosocial or selfish motives in the author. Additionally, a positively correlated interaction between these two variables ($p = 0.53$) suggests that participants might see the author as both prosocial and selfish, rather than attributing just one motive. This interaction can potentially indicate that these variables appear to be unpredictable in this research.

In relation to our second hypothesis, a marginally significant effect was found between gender and the dependent variable selfishness. This suggests that among different types of meat-eaters (including meat-eaters, flexitarians and pescetarians), there are variations in how men and women perceive selfish motives in the author's text. Interestingly, we observed that

meat-eating women tended to attribute higher levels of selfish motives to the author, indicating potential differences in messages are interpreted between genders. This finding contradicts earlier literature; for instance, Michel et al. (2021) found that women tend to be more sensitive to animal welfare concerns related to meat consumption. If our study were consistent with Michel et al. (2021), we might have expected an inverse relationship, with men displaying higher tendencies to attribute selfish motives to the author in defense of their preference for a meat-based diet compared to women. Additionally, our findings contradict those of Hinrichs et al. (2022), which suggested that men are generally more defensive about plant-based diets compared to women. However, it is important to interpret this result with caution, due to the marginally significance. Moreover, the influence of our small sample size, which excluded vegetarians/vegans for the analysis, may have affected these findings, limiting this conclusion to a subset of meat-eaters. To determine the robustness of this result, further research with a larger and more diverse sample size is necessary.

Conversely, no significant effects were found for the persuasiveness and prosocial dependent variables concerning both the main effects and the interaction effects. This suggests that both men and women interpreted persuasive messages similarly across the different dietary groups. The message was equally convincing for both genders and across different dietary preferences, and there were no differences between the genders in whether or not they inferred prosocial motives to the author.

Theoretical Implications

In examining the theoretical implications and addressing the question of whether the salience of moral implications of meat consumption predicts moral disengagement, we must revisit the foundation of this problem, known as the meat paradox. This study provided theoretical implications for understanding the meat paradox and the broader perspective of the self-serving bias, motivational reasoning and moral disengagement.

The idea of the self-serving moral disengagement illustrates how cognitive dissonance influences our dietary choices. Specifically, the meat paradox highlights how individuals continue to eat meat despite knowing its environmental and ethical impacts, often due to the self-serving bias (Bastian & Loughnan, 2017). Similarly, Graça and colleagues (2016) argue that in highly routinized behaviors, like meat consumption, moral perception often is hindered until the consequences become salient. This suggests that individuals may either try to minimize the damage of their actions or justify and defend their behavior to maintain a positive self-view. Therefore, moral disengagement and self-serving biases are key factors in why meat consumption persists despite growing awareness. Our research supports this, as our first hypothesis found that meat-eaters tend to morally disengage when the consequences of their meat consumption are made salient.

Moreover, this study emphasizes how social norms influence our dietary choices. It demonstrates that beyond individual cognitive processes, moral disengagement is also shaped by our social environment. As highlighted by Robinson et al. (2014), we are influenced by informational norms. This influence was evident in our research as well. We found that participants' dietary preferences affected how persuaded they were by the arguments presented in the text. For meat-eaters, the familiarity and acceptance of a meat-based diet from their reference group might have made them less open to considering alternative viewpoints. Therefore, to encourage more individuals to adopt vegetarian or vegan diets, it could be effective to focus on shifting these social norms. Making plant-based diets more socially desirable and accepted could lead to greater openness and acceptance among individuals.

These theoretical implications highlight the importance of motivational reasoning in shaping our dietary preferences. Individuals often strive to maintain a positive self-image and

avoid psychological discomfort, which influences how they justify behaviors that might raise ethical and environmental concerns.

Practical Implications

It is interesting to see that the a-priori belief of participants influenced how they perceived the persuasive message. People who already did not consume meat found the persuasive text more convincing. This suggests that the current communication strategy, which resonates more with vegetarians and vegans, may be more effective for them than for meat-eaters. However, since vegetarians and vegans are already convinced not to eat meat, our goal is to reach the meat-eaters and encourage them to reduce, or ideally stop eating meat. The question remains: how can we effectively reach meat-eaters?

Communication Strategies

To effectively reach the meat-eaters, creating personalized and targeted messages that directly address their specific concerns is essential. Moreover, presenting these messages as a personal threat may have a significant impact. By making the negative consequences of their dietary choices salient, meat-eaters are confronted with their moral concerns directly. This approach creates cognitive dissonance, potentially leading to moral disengagement in response to feeling personally challenged and activating their self-serving biases.

Furthermore, it might be more effective to initially encourage meat-eaters to reduce their meat consumption rather than promoting a completely vegetarian or vegan lifestyle. Since this goal is closer to their current dietary habits, it might seem more achievable and less threatening, reducing the likelihood of resistance. By promoting a less meat-based lifestyle, meat-eaters might gradually become more open to further reducing their meat consumption, potentially leading to adopting a vegetarian or vegan lifestyle in the future.

Broader Implications

The findings from this study have broader implications for communication strategies beyond meat consumption. They could potentially be applied to climate change advocacy, non-smoking campaigns, and political messaging. Understanding that people shape their realities based on personal biases helps us create messages that are more likely to reach different audiences.

Role of the Communicator

Lastly, this study highlights how crucial the communicators' role and credibility are. Even though the persuasive message was the same for all participants, their reactions differed depending on how they perceived the author. This shows the importance for the communicator to build trust and credibility when delivering a message to improve its effectiveness.

Strengths and Limitations

This study provided valuable insight and strengths. Despite the small sample size, the study still produced significant effects, demonstrating that the study materials achieved the desired effect. Specifically, the quality of the text used in the questionnaire was persuasive enough for participants to infer different motives in the author, even though it was the same text. Additionally, we included a variety of people in each category to make assumptions about different dietary preferences. Lastly, our measurement setup provided participants with a realistic scenario. Participants were asked to react in the moment, rather than giving them time to frame their opinions about certain aspects. This shows that this research successfully captured participants' a-priori beliefs.

Although this research provides valuable insights, some limitations need to be addressed. One limitation of the study is the relatively small sample size, consisting of first-year students, which may limit the generalization of the findings. For example, this influenced the outcome of the second hypothesis related to gender. There were too few male

vegetarians/vegans, so this category had to be excluded from the analysis. As a result, only the meat-eaters were compared with each other, affecting the results because there is no comparison group as stated in the hypothesis. Additionally, it is important to highlight that the results only apply to first-year students from a relatively specific age group, which can also influence the generalizability of the findings.

Future Research Directions

For future research, it is first advised to replicate this study with a larger sample size. Since the sample size in this research is too small to draw definite conclusions, it would be interesting to see if the same results are found with a larger sample. Additionally, when replicating the study, it is recommended to use a more diverse sample, focusing on gender and age. For example, there could be possible differences in masculine factors between young and old men. Dowsett et al. (2018) discussed the four N's of justification for meat consumption, which include; normal, natural, necessary and nice. When focusing on these factors, it might be more normal and natural for older men to eat meat, since they might be brought up with a more traditional view on dietary preferences among genders, whereas meat is often considered to be a 'masculine' food type, while dairy products, fruits, and vegetables are typically labelled as 'feminine' (Rosenfeld, 2020). This perspective leaves a potential opening for future research to explore the impact between generations on their motivations for their dietary preferences. Additionally, a follow-up study could also focus on the influence of the communicated message. A stronger, more targeted message directed especially at meat-eaters could be used to investigate the effects of a more threatening form of communication. This approach allows for examining whether more personalized communication leads to stronger persuasive effects.

Conclusion

This research provided valuable insights into the mechanisms underlying individuals' motives for maintaining a meat-based diet related to the meat paradox. It has demonstrated the influence of persuasive messages on moral disengagement, where meat-eaters tended to engage in moral disengagement when they found the persuasive message less convincing, and possibly felt threatened. Additionally, marginal evidence was found for the effect of gender on perceiving the author as selfish. Indicating with caution that gender plays a role in moderating dietary preference in relation to persuasiveness.

So, how can we effectively reach the meat-eaters? This question requires a nuanced understanding of the complex interplay between personal and social influences, the role of the communicator and the motivations behind dietary choices. However, more research is needed to better answer this question. Therefore, future research should focus on replicating this study with a larger sample, exploring the influence of the communicator, investigating the role of potential generational differences, and examining the impact of threatening messaging in promoting behavior change among meat-eaters. By continuously unravelling the meat paradox, we can work towards promoting vegetarian and vegan diets, and thereby reduce the environmental and ethical consequences of meat consumption.

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Appendix

Table 1

Pearson's Correlations

Variable	Days	Reduce	Gender	CogRef	Selfish	Prosocial	Persuasiveness	Diet
Days	Pearson's r —							
Reduce	Pearson's r -0.54 **	—						
Gender	Pearson's r 0.24	-0.17	—					
CogRef	Pearson's r -0.03	0.03	0.06	—				
Selfish	Pearson's r -0.10	0.03	-0.22	-0.02	—			
Prosocial	Pearson's r -0.02	0.08	-0.17	0.11	0.53 **	—		
Persuasiveness	Pearson's r -0.24	0.30 *	-0.11	0.26 *	-0.15	0.31 **	—	
Diet	Pearson's r -0.73 **	0.38 **	-0.19	0.19	0.08	0.02	0.55 **	—

Note. * $p < .05$, ** $p < .01$, CogRef = Cognitive Reflection

Table 2

Custom Contrast – Male vs. Female

Comparison	Estimate	SE	df	t	p
1	-0.66	0.34	60	-1.96	0.06

Table 3

Custom Contrast Coefficients – Female vs. Male

Gender	Comparison 1
Female	-1
Male	1

Table 4*Custom Contrast - Diet*

Comparison	Estimate	SE	df	t	p
1	1.549	0.988	73	1.568	0.121

Table 5*Custom Contrast Coefficients - Diet*

Diet	Comparison 1
Meat-eaters	-1
Flexitarians	-1
Pescetarians	-1
Vegetarians/Vegans	3

Table 6*ANOVA - Persuasiveness*

Cases	Sum of Squares	df	Mean Square	F	p	η^2_p
Diet	16.09	2	8.04	17.62	< .001	0.37
Gender	0.40	1	0.40	0.88	0.35	0.01
Gender * Diet	0.45	2	0.22	0.49	0.62	0.02
Residuals	27.84	61	0.46			

Note. Type III Sum of Squares

Table 7*ANOVA - Prosocial*

Cases	Sum of Squares	df	Mean Square	F	p	η^2_p
Diet	0.05	2	0.02	0.04	0.96	0.001
Gender	0.65	1	0.65	0.99	0.32	0.02
Gender * Diet	2.02	2	1.01	1.55	0.22	0.05
Residuals	39.18	60	0.65			

Note. Type III Sum of Squares**Table 8***ANOVA - Selfish*

Cases	Sum of Squares	df	Mean Square	F	p	η^2_p
Diet	0.72	2	0.36	0.22	0.80	0.01
Gender	6.19	1	6.19	3.84	0.06	0.06
Gender * Diet	0.57	2	0.29	0.18	0.84	0.01
Residuals	96.77	60	1.61			

Note. Type III Sum of Squares

Table 9*Frequencies for Diet: Female and Male*

Gender	Diet	Frequency	Percent	Valid Percent	Cumulative Percent
Female	Meat-eaters	11	24.44	24.44	24.44
	Flexitarians	19	42.22	42.22	66.67
	Pescetarians	11	24.44	24.44	91.11
	Vegetarians/Vegans	4	8.89	8.89	100.00
	Missing	0	0.00		
	Total	45	100.00		
Male	Meat-eaters	8	28.57	28.57	28.57
	Flexitarians	14	50.00	50.00	78.57
	Pescetarians	5	17.86	17.86	96.43
	Vegetarians/Vegans	1	3.57	3.57	100.00
	Missing	0	0.00		
	Total	28	100.00		