



# Confirmatory evidence that the denial of animal minds explains the "meat paradox"

A recommendation by **Chris Chambers**  based on peer reviews by **Ben De Groeve**, **Brock Bastian** and **Florian Lange** of the STAGE 2 REPORT:

Tyler P. Jacobs, Meiyang Wang, Stefan Leach, Ho Loong Siu, Mahika Khanna, Ka Wan Chan, Ho Ting Chau, Yuen Yan Tam, Gilad Feldman (2024) Revisiting the motivated denial of mind to animals used for food: Replication Registered Report of Bastian et al. (2012). OSF, ver. 4, peer-reviewed and recommended by Peer Community in Registered Reports.  
<https://doi.org/10.17605/OSF.IO/H2PQU>

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The psychology of meat-eating offers a fascinating window into moral reasoning, cognition and emotion, as well as applications in the shift toward more sustainable and ethical alternatives to meat consumption. One key observation in this field is the so-called "meat paradox" – the tendency for people to simultaneously eat meat while also caring about animals. One way to resolve this conflict and reduce cognitive dissonance is for people to separate the concept of meat from animals, mentally disengaging from the origins of meat in order to make the act of consumption more ethically acceptable. Another potential explanation is a motivated "denial of mind", in which people believe that animals lack the mental capacity to experience suffering; therefore, eating an animal is not a harm that the animal will experience. In support of the latter hypothesis, Bastian et al (2012) found that animals judged to have greater mental capacities were also judged as less edible, and that simply reminding meat eaters that an animal was being raised for the purposes of meat consumption led to denial of its mental capacities. Using a large-scale online design in 1000 participants, Jacobs et al. (2024) replicated two studies from Bastian et al. (2012): asking how the perceived mental capabilities of animals relates to both their perceived edibility and the degree of moral concern they elicit, and whether learning that an animal will be consumed influences perceptions of its mental capabilities. The original findings were successfully replicated. For study 1, attributions of mind were negatively related to animals' edibility, positively related to negative affect towards eating animals, and positively related to moral concern for animals. For study 2, learning that an animal would be used for food led participants to attribute less mind to the animal.

Overall, the results strengthen the conclusion that motivated denial of animal minds can be a mechanism for resolving the 'meat paradox'. The Stage 2 manuscript was evaluated over one round of in-depth review. Based on detailed responses to the reviewers' comments, the recommender judged that the manuscript met the Stage 2 criteria and awarded a positive recommendation. **URL to the preregistered Stage 1 protocol:** <https://osf.io/cru4z> **Level of bias control achieved: Level 6.** *No part of the data or evidence that was used to answer the research question was generated until after IPA.* **List of eligible PCI RR-friendly journals:**

- [Advances in Cognitive Psychology](#)
- [Collabra: Psychology](#)
- [F1000Research](#)
- [International Review of Social Psychology](#)
- [Journal of Cognition](#)
- [Meta-Psychology](#)
- [Peer Community Journal](#)
- [PeerJ](#)
- [Psychology of Consciousness: Theory, Research and Practice](#)
- [Royal Society Open Science](#)
- [Social Psychological Bulletin](#)
- [Studia Psychologica](#)
- [Swiss Psychology Open](#)

#### **References:**

1. Bastian, B., Loughnan, S., Haslam, N., & Radke, H. R. M. (2012). Don't mind meat? The denial of mind to animals used for human consumption. *Personality and Social Psychology Bulletin*, 38, 247–256. <https://doi.org/10.1177/0146167211424291>
2. Jacobs, T. P., Wang, M., Leach, S., Loong, S. H., Khanna, M., Chan, K. W., Chau, H. T., Tam, Y. Y. & Feldman, G. (2024). Revisiting the motivated denial of mind to animals used for food: Replication and extension of Bastian et al. (2012) [Stage 2]. Acceptance of Version 2 by Peer Community in Registered Reports. <https://osf.io/mwyde>

## **Reviews**

### **Evaluation round #1**

DOI or URL of the preprint: <https://osf.io/b5ep8>

Version of the preprint: 3

## Authors' reply, 20 February 2024

Revised manuscript: <https://osf.io/mwyde>

All revised materials uploaded to: <https://osf.io/h2pqu/> , updated manuscript under sub-directory "PCIRR Stage 2\PCI-RR submission following RNR"

[Download author's reply](#)

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## Decision by [Chris Chambers](#) , posted 21 September 2023, validated 21 September 2023

### Revision invited

Three of the four reviewers from Stage 1 were available to evaluate your Stage 2 submission. As you will see, the reviews are overall positive, but with some issues to address concerning the Discussion as well as some presentational matters. In revising, please avoid any changes to the approved Stage 1 parts of the manuscript unless doing is necessary to improve clarity or correct an error. I will assess your revised manuscript and response at desk, and hope to be able to reach a final decision with requiring further in-depth review.

## Reviewed by [Ben De Groeve](#), 20 August 2023

Thank you for inviting me to review the Stage 2 Registered Report documenting a direct replication of Studies 1 and 2 of Bastian et al. (2012) on the motivated denial of food animal minds. I evaluate the different components of the report based on the [guidelines for PCI reviewers](#), making a distinction between positive feedback and critical feedback, concerns and suggestions (no major issues).

### Positive feedback

- The **title** is clear and the **abstract** presents main findings compared with original findings.
- The **introduction** builds on relevant recent and past research (i.e., on the meat paradox), the motivation of the study is clear (i.e., high-power replication of Studies 1 and 2 of Bastian et al., 2012) and the hypotheses and predictions are clearly presented in Table 1 (p.9).
- In general, the **materials and methods** are clearly described. Table 2 allows to easily compare the replication sample with the original samples in Bastian et al. (2012), Table 3 clearly summarizes the design and materials of both studies, Table 4 summarizes deviations between the original and replication studies and Table 5 provides details on replication closeness. The data analysis strategy is appropriate and shows that the authors gave it considerable thought.
- Concise reporting of the **results** and good visualizations.
- The **discussion** of the results is overall adequate; relevant past and recent research is taken into account and future directions are relevant as well. The scientific significance of the study is clear.
- **References** are appropriate.

### Critical feedback, concerns and suggestions

*p.1: 'OCRID'*

Needs to be 'ORCID'.

### **Abstract:**

- "original: 80 [.63, .90]": "r =" is missing
- "its' mental capacities": remove apostrophe
- I think the meat paradox is not *maintained* (first and forelast sentence in abstract), but *resolved* by motivated denial of food animals' minds (see also comment below).
- Not sure whether it's necessary to also mention the OSF link in the abstract.

### **Materials and methods**

#### **M&M: Power analysis**

*p.11: "Results from power analyses are summarized below."*

This statement seems rather vague to me. Where is the summary below? Or do the authors refer to the Supplementary Materials?

*p.11:* In the paragraph on two notes about the study design the flow is a bit broken. It is also somewhat confusing because this section is about power analyses and sample sizes and there is a section about the study design on p.13. To maintain focus, perhaps the authors could begin the paragraph by writing that they eventually decided to gather 1000 participants and then mention the reasons (i.e., uncertainty related to multi-level nature of the data and combining Studies 1 and 2)? Relatedly, it is not entirely clear to me why combining Studies 1 and 2 into a single data collection would require a larger sample. (Is it to take into account potential carry-over/attenuation effects?)

#### **M&M: Participants**

*p.12: "Assignment pay was \$1.90 USD."*

To reflect chronological order, I would write this sentence at the end of the paragraph about pretesting survey duration and adjusting payment.

#### **M&M: Design and procedure**

*p.15: "Both Studies 1 and 2 in Bastian et al. (2012) were combined into a single survey, and the presenting order of Studies 1 and 2 was randomized."*

This was just mentioned on p.13. I recommend to remove this sentence and/or rephrase the previous sentence: "Then, participants began Studies 1 and 2 in a random order."

*p.15:* The paragraph on the procedure already mentions some details about Study 1 and 2 Materials, which can be replaced to their respective sections below to avoid repetition. Or are these details mentioned here to communicate the design of both studies? In any case, I suggest to avoid too repetitive language. For example, in the section 'Study 1 Materials', the authors could also write something like:

"The 32 animals in our survey were the same as the ones in the original study except for 2 animals (...). For each of the 8 randomly selected animals, participants were asked 14 questions, as shown in Table 3."

#### **M&M: Study 1 and 2 Materials**

I recommend to rename Table 3 as "Summary of study design and materials", because the authors often refer to this table in this section.

Minor limitation/future research direction related to the supplementary (p.25): I wonder why the authors used 'it' instead of 'this cow' in Version 2: cow as food animal? Theoretically, this type of objectifying language could (further) increase mind denial (Leach and Dhont, 2023). The authors did not write 'it' for Version 1: lamb as food animal. Given that the type of animal didn't have a differential effect on mind denial (supplement), the use of 'it' probably didn't play a significant role either (unless a weaker mind denial for cows (vs. lambs) was counter-acted by the use of 'it' in the cow as food condition). Of course, writing about a cow or lamb as food/meat product is already objectifying. How we talk about animals may affect our perceptions of animals (Kunst and Hohle, 2015; Leach and Dhont, 2023); different types of objectifying language (e.g., giving an animal a name vs. a number) may have different effects, which could be considered for future research.

### **Manipulation checks**

p.16: I suggest to replace the phrase "(...) *after* rating the mental capabilities of each animal." to the end of the first sentence of this paragraph to make this immediately clear.

Please also report information about the effectiveness of the manipulations, either in this section, the results section or the supplementary.

### **M&M: Deviations from the original**

I suggest to write: "We summarized other (or additional) deviations between the original (...)"

#### **Evaluation criteria for replication findings**

Perhaps a matter of taste, but I think this section is not strictly necessary because the evaluation criteria seem rather intuitive and are preregistered anyways. When discussing the results, you can simply refer to these preregistered evaluation criteria in the supplementary to establish that the replication was successful.

Table 5: I think it would be more accurate to write that the vegetarians and vegans were excluded *from participation in the survey*, rather than writing that they were excluded "at the very beginning" because the latter may be interpreted as exclusion based on some explicit measurement at the very beginning of the survey.

#### **M&M: Outliers and exclusions**

This section seems redundant because:

- outliers are not discussed
- the recruitment filter to exclude vegetarians and vegans was already discussed in the section 'Participants'
- the second paragraph talks about an exclusion that didn't occur and was already mentioned in the section on attention checks

The only new information is the question at the end of the survey to verify whether participants are not vegetarian or vegan, but no information is given about the results or the effectiveness of the recruitment filters. Perhaps 'exclusions' can be addressed in the section 'Participants'.

### **Results**

#### **Study 1**

p.22:

- the *M* and *SD* is not shown for edibility.
- Why is  $r(30)$  if the sample size is 959?

Figure 1:

- Perhaps the correlation coefficient can also be shown in Figure 1?
- Is it possible to also include scatterplots for negative affect and moral concern in Figure 1? An image says more than words and it might be useful for communication purposes.
- Minor suggestion: I don't know how easy it is to make these plots, but perhaps if you put the scatterplots next to each other and make the plots more elongated (shorter x-axis) you might be able to show the names of all animals with their data points?

## Study 2

p.23

- What does "yet with signal and in the same direction." mean? I know this is explained in the supplementary, but it might not be immediately clear for readers.

Figure 2:

- The writing in Figure 2 is difficult to read (small size, a bit blurry)
- I suggest to include pictures of the cow and the lamb to make the results more visually appealing or to clearly refer to Figure S1 in the supplementary materials when discussing Study 2 Materials.

No information is given on the 'additional' analyses mentioned in the Materials and Methods section (concerning potential order effects, etc.). Even if there are no notable results, I think you should briefly address it in the the section 'Materials and Methods' or 'Results' and refer to the Supplementary Materials for a full description.

## Discussion

"In short, the work reinforces the view of the 'meat paradox' as grounded in reliable empirical data."

More specifically, the work improves empirical support for 'motivated mind denial' (as a mechanism to *resolve* the meat paradox). Put differently, the current reference to the meat paradox ("caring for animals yet eating them") might be somewhat confusing because the data suggests that viewing an animal as edible makes people *less* caring (i.e., edibility is associated with lower mind attributions, which in turn is associated with less moral concern) - which *resolves* the meat paradox.

p.26: "motivated mind denial in such a paradigm speaks either to the strength of the drive to maintain the meat paradox"

I think 'maintain' should be 'resolve'. There does not seem to be a drive to maintain care for animals while eating them (i.e., the meat paradox), rather a drive to maintain the use/view of animals as food and care less about them as a consequence (resolving the meat paradox).

p.27: "Vegetarians and vegans may even be motivated to show the opposite pattern of mind attribution,"

You mean that vegetarians and vegans may be motivated to overestimate mind in animals to increase moral concern? This could be expected based on theory. Somewhat surprisingly, though, Leach et al. (2023) found that meat-eaters and veg\*ns show largely the same tendency to underestimate animal minds.

Concerning the role of culture, I thought you might find a difference in the perceived edibility of Kangaroos, as

Bastian et al. (2012) recruited Australian participants. It does seem like Kangaroos were seen as more edible in Study 1 of Bastian et al. (2012) compared to your replication study. You could use this as an example to clarify your point, though there are also many [other examples of course](#). The study of [Piazza and Loungnan \(2016\)](#) about attitudes towards a fictional animal is also relevant.

## **Conclusion**

Same comment as before on "(...) and reinforces the view of the meat paradox as grounded in reliable empirical data". I suggest to write something like: "(...) in the light of expanding research on how people resolve the meat paradox."

Thank you for your work.

## **Reviewed by Brock Bastian, 21 August 2023**

Thank you for the opportunity to review this report. It was certainly reassuring to see our findings replicated and thank the authors for their work in putting our original predictions to a more robust test. I had few comments regarding the current manuscript and feel that it is publication ready. The only thing I noted was one statement in the discussion:

"The fact that we observed motivated mind denial either speaks to the strength of the drive to maintain the meat paradox in the face of blatant inconsistency or the irrelevance of the filler task..."

I don't think this says that it is supposed to? People are motivated to solve not maintain the meat paradox....so perhaps replacing 'maintain' with 'solve' here would fix this?

Cheers

Brock

## **Reviewed by Florian Lange, 03 September 2023**

As far as I can tell, the authors conducted the replication study as registered and found results consistent with the original study. They also conducted potentially interesting additional analyses (but due to a lack of integration of the corresponding results into the main text, it is hard to see what exactly those analyses add). In my opinion, the following issues should be addressed.

1. My main concern is that I did not see much discussion of the limitations of the present methodology. The authors do a great job demonstrating similarities with and deviations from the original study, but any limitations of the original study also affect the evidentiary value of this novel data point and should be discussed in order not to provide readers with the wrong impression that the original and present results have been obtained with perfect validity. Can the results of the correlational test, for example, be due to response styles or common method variance? What are the psychometric properties of the measure the authors used to assess "perceived mental capacities" of animals, that is, how confident are we that we can validly and reliably assess such a perception? Also, to which population of animals are the findings from Study 1 supposed to generalize? I don't think the animals have been randomly sampled from the animal kingdom. To what extent would a bias in the sampling of animals limit the generalizability of results? Would we get the same results with 30 invertebrates? In other words, can the correlation, albeit replicable, be a mere artifact of the selected animals?

2. The same applies to the integration with other literature. The authors mention a study by Possidónio et al. that did not obtain a correlation between perceptions of edibility and mental capacity. How can they account for this? In the end, I think the authors want to make conclusions about this relationship (between characteristics of human perceptions) as it exists in the real world (and not about the relationship observed

between variables in the data by Bastian et al.), so the discussion of evidence (and limitations, see above) should go beyond the replicated study.

3. As far as I can see, there is no reference to the results from the additional analyses in the main text of the manuscript. I think this should be changed. I assume these additional analyses were conducted to further inform the interpretation of the results (e.g., in terms of robustness/generalizability), so the authors should take them into account when interpreting their data.

Minor comments

1. Please specify how gender was assessed. Was "other" the gender category participants had to select when not identifying as male or female? Is it possible to avoid othering here?

2. This can of course be a coincidence, but is it correct that both age M and age SD have two zeros after the decimal point?

3. I do not understand the phrase "yet with a signal" and have never encountered it in empirical articles before. Consider revising.

4. I don't think that the conclusion that this work reinforces the view of the meat paradox (p26) follows from the present data. It should be removed or substantiated.