

When evolution works against the future: Disgust's contributions to the acceptance of new food technologies

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1 Introduction

Fig 1. Nanotechnology food box.
Source: Box: <https://www.comi.com/>; Silver particles: <https://www.umweltbundesamt.de/en/topics/chemicals/nanotechnology/research-development-projects>; Loupe: <http://pluspng.com/png-lupe-3468.html>

Fig 2. Edible nanotechnology coating film.
Source: Layer: <https://www.mdpi.com/2079-4991/7/2/48.htm>

Fig 3. Genetically modified fish.
Source: DNA: <https://www.thingslink.com/scene/844654866767806465>; Head: <https://peabody.com>

Fig 4. Artificial meat.
Source: <http://goodtimes.sc/columns/wellness/cultured-meat-good/>

Fig 5. Artificial milk.
Source: <http://dca.au.dk/en/current-news/news/show/artikel/indsats-paa-mange-fronter-skal-give-bedre-maelkevalite/>

Fig 6. Synthetic food additive: Citric acid.
Source: <https://www.wikihow.com/Make-Fizzy-Lemonade>

Fig 7. Genetically modified meat.
Source: Nematode: <https://www.nematodeinformation.com/nematode-information/en/ncp/pathogenic-nematodes-use-different-entry-routes-points-to-enter-into-their-insack-hosts-body-nematode-information>

- The disgust system evolved as a risk avoidance mechanism protecting an organism from contact with potential pathogenic contaminants.⁽¹⁾
- Nowadays, it may contribute to the low acceptance of new food technologies in consumers.⁽²⁾

2 Materials

Online survey ($N = 313$, $M_{Age} = 45.24$ years, $SD = 14.48$):

Descriptions of 7 new food technology applications

Disgust measures

- State disgust:** Disgust response towards a new food technology
- Trait disgust:** Food Disgust Scale ⁽²⁾ measures people's food disgust sensitivity – an individual's tendency to experience disgust towards food-related cues (e.g., a snail in one's salad)

Dependent variables

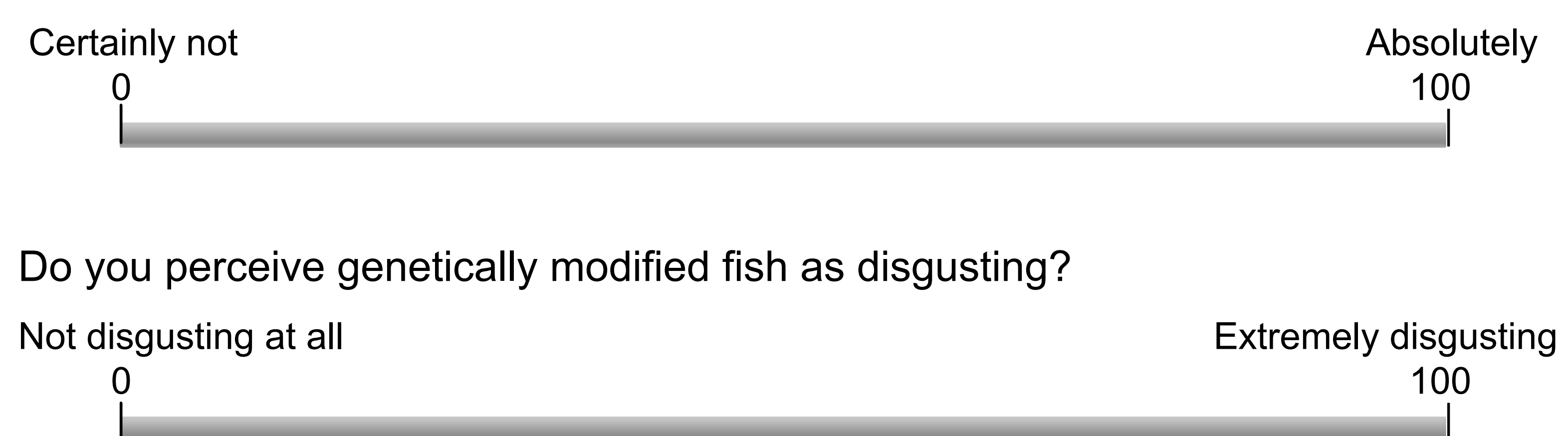
- Acceptance measured by willingness to eat or drink

3 Method overview

Example: Genetically modified fish: Fish can be genetically modified to increase its resistance against diseases by inserting a human lactoferrin gene. Lactoferrin is an enzyme with antiviral and antimicrobial properties.

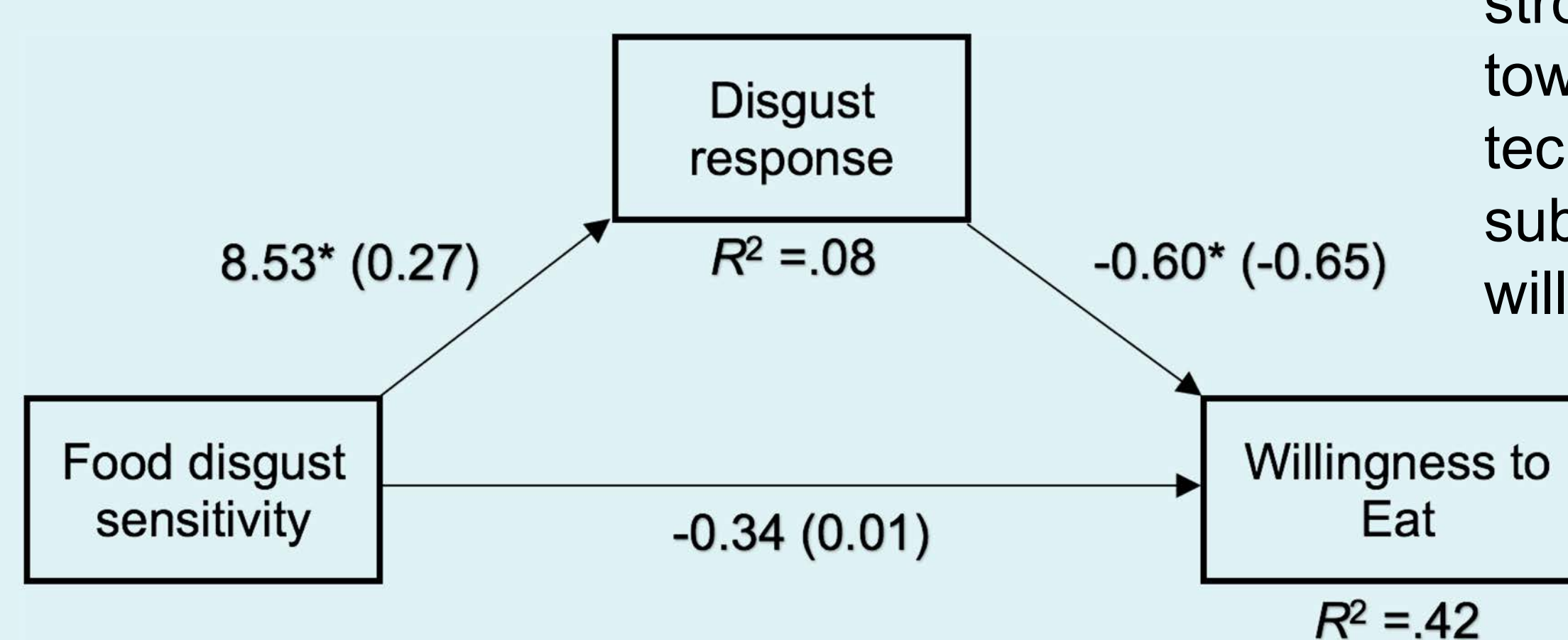
Would you eat genetically modified fish?

Please indicate your answer on the desired position on the slider



4 Results

Full mediation model: Genetically modified fish



The higher people's food disgust sensitivity, the stronger the disgust response towards various new food technologies, and subsequently, the lower the willingness to eat (or drink).

Fig 8. * $p < .001$. Non-standardized estimates are displayed first. Standardized parameters are in parentheses.

5 Conclusion

- New food technologies may be perceived as a potential danger when consumed, because technology-specific cues might provoke, for example, contamination fear (e.g., a foreign gene inserted in another organism like in gene technology).
- Interventions to increase acceptance in consumers should take into account disgust-eliciting aspects of a new food technology.

6 References

- Curtis, V., Aunger, R., & Rabbi, T. (2004). Disgust as an adaptive system for disease avoidance behaviour. *Proceedings of the Royal Society Biological Sciences Series B*, 271(7), 131-133.
- Gaskell, G. et al. (2010). Europeans and biotechnology in 2010. Luxembourg: Publications Office of the European Union.
- Hartmann, C., & Siegrist, M. (2018). Development and validation of the Food Disgust Scale. *Food Quality and Preference*, 63, 38-50.