

A.

## Introduction

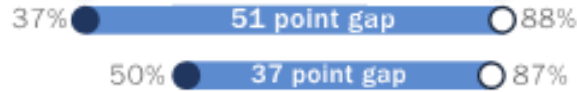
### Biomedical sciences

Safe to eat genetically modified foods

Climate change is mostly due to human activity

U.S. adults

AAAS scientists



### Why is communicating scientific consensus important?



Notable gaps between public acceptance and scientific consensus on several collective action problems (Pew Research, 2015)



Belief in pressing issues (i.e. support for climate policy) increases when consensus information is highlighted (Lewandowsky et al., 2013)



People often use consensus information (the ratio of people in agreement) to verify a claim amongst a sea of conflicting information

### Factors that influence consensus judgements

#### 1. Source expertise: Who would you trust more?



“Regular aerobic exercise lowers blood pressure”

vs.



“Regular aerobic exercise lowers blood pressure”

#### 2. Claim type: What type of claims are likely to have consensus?



Presence of consensus more likely for claims that have a “ground truth” and are verifiable (Alister et al., 2024)

#### 3. Prior belief: How much of the claim do you agree with?



People are motivated to maintain their beliefs (Kunda, 1990) and overestimate how widely held these are (Bauman & Geher, 2002)

#### 4. Intellectual humility: Could existing beliefs be wrong?



Anti-consensus views linked to knowledge overconfidence and lack of objective scientific knowledge (Light et al., 2022; Fernbach et al., 2019)

#### 5. Others: Consensus wording and amount of agreement on claim



Threshold for judging presence of consensus might be different to judging lack of consensus (e.g. Oreskes & Conway, 2010)



People are more convinced of a claim that multiple people agree with i.e. “97% agree that...” (e.g. Asch, 1956; Alister et al., 2024)

B.

## Aim & Hypotheses

### Aim: What cues do people use to judge the presence of consensus?

1. Will higher amounts of agreement on the claim lead to more consensus judgements?
2. Will testimony from experts be positively associated with judgements of consensus?
3. Will presence of consensus and lack of consensus be judged in the same way?

C.

## Methods



150 American Adults (73 female, 75 male, 2 NA); aged 21-76 ( $M = 45.1$ ,  $SD = 15.9$ ); recruited on Connect Cloud Research and paid \$2.50 each

### Material

A series of 30 claims and their percentage agreement were drawn from:

BOSTON REVIEW



GALLUP



Topics: drawn from past literature (e.g. Bauman & Geher, 2002) and current issues from fact-checking websites like AllSides; full list of claims: [osf.io/8ywaj/](https://osf.io/8ywaj/)

Example claims shown to participants:

“17 in 20 **scientists** believe that childhood vaccines such as MMR should be mandatory”

“55% of **people** believe that the laws covering the sale of firearms should be made more strict”

### Procedure

1. Rate prior belief in all 30 claims in random order on a 7-point likert scale
2. Judge whether there is consensus on the same 30 claims
  - a. Between-subjects: *presence or lack of consensus judgements*
  - b. Within-subjects: testimony (scientist or non-scientists), percentage agreement on the topic (0 – 100%), and format of numerical information (e.g. 50% or 1 in 2)
3. Fill out demographics and intellectual humility scale (Leary et al. 2017)

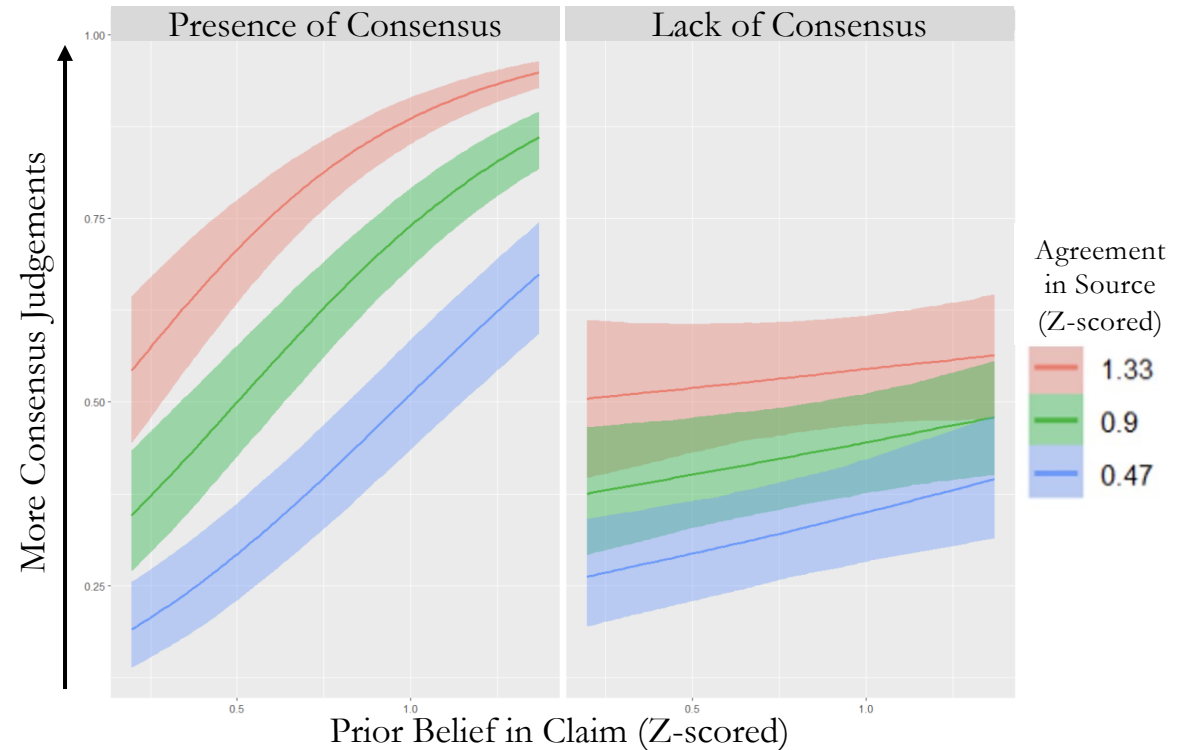
D.

## Results



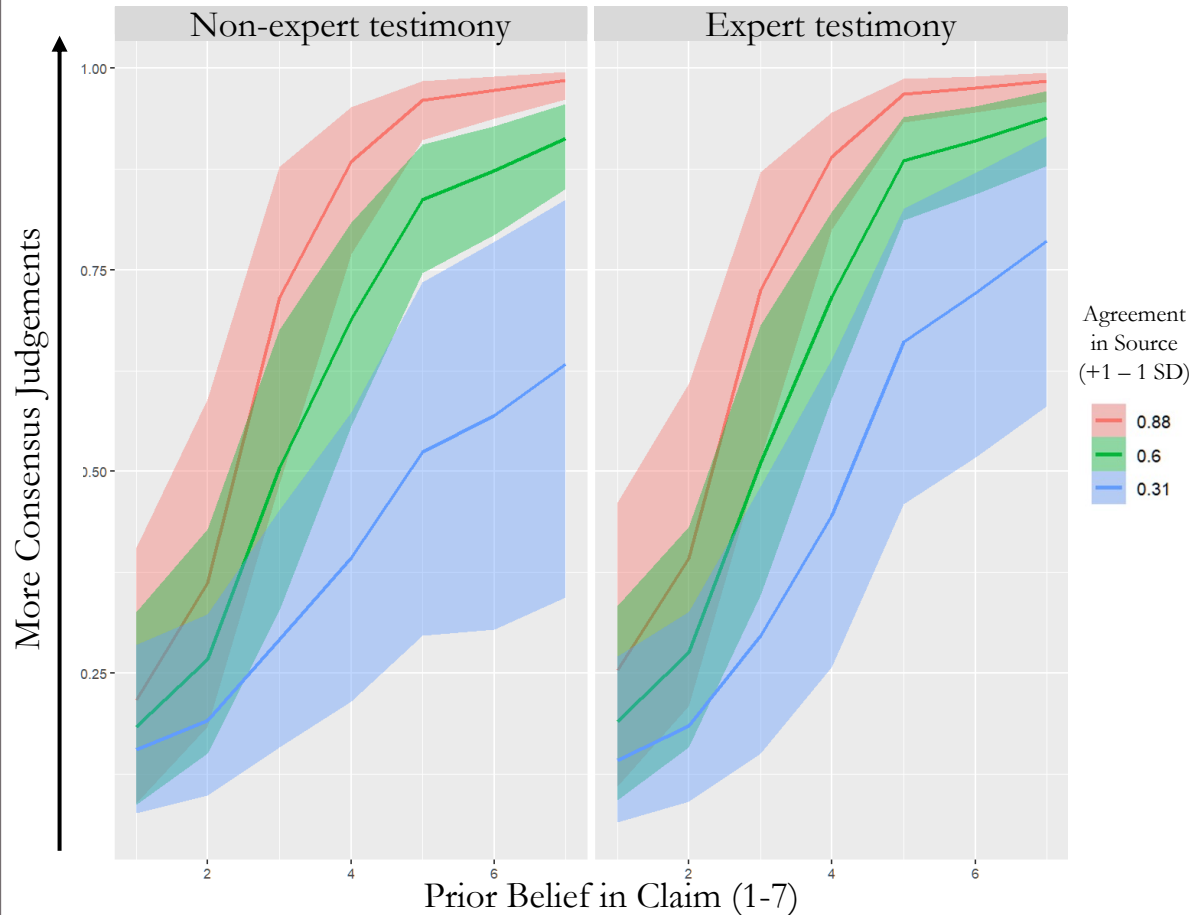
Bayesian mixed-effects logistic regression predicting consensus judgments, including interactions between predictors

### Level of agreement, prior beliefs, and consensus condition



- ☐ Higher amount of agreement from the source led to more consensus judgements, across both conditions
- ☐ Higher prior belief in claim led to more consensus judgements
- ☐ Strong effect of consensus condition: the effect of belief on consensus judgements is reduced in lack of consensus condition

## Expert vs. non-expert testimony



- ❑ People were more likely to say that there's widespread consensus when there is agreement amongst experts (e.g. scientists) compared to non-experts
- ❑ Model that included interaction between intellectual humility and prior belief did not credibly predict consensus judgements

## E.

## Discussion

### Conclusion

- ❑ People based their consensus judgements on the existing level of agreement, source expertise, and their prior beliefs about the claim
- ❑ Intellectual humility did not significantly impact consensus judgements
- ❑ People judged presence of consensus differently to lack of consensus

### Future Directions

- ❑ Visual presentation of agreement with icon arrays
- ❑ Vary wording for lack of consensus condition (e.g. “absence of consensus” or “no consensus”) to see if results replicate
- ❑ Measuring behavioural outcomes due to consensus judgements
- ❑ Looking at political speeches discussing scientific topics to see when “lack of consensus” sentiments arise

## F.

## References

- Alister, M., Ransom, K. J., Connor Desai, S., Soh, E. V., Hayes, B., & Perfors, A. (2024). Sensitivity to Online Consensus Effects Within Individuals and Claim Types. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 46. <https://escholarship.org/uc/item/2rm2155p>
- Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and Applied*, 70(9), 1–70. doi: 10.1037/h0093718
- Bauman, K. P., & Geher, G. (2002). We think you agree: The detrimental impact of the false consensus effect on behavior. *Current Psychology*, 21(4), 293–318. <https://doi.org/10.1007/s12144-002-1020-0>
- Fernbach, P. M., Light, N., Scott, S. E., Inbar, Y., & Rozin, P. (2019). Extreme opponents of genetically modified foods know the least but think they know the most. *Nature Human Behaviour*, 3(3), 251–256. <https://doi.org/10.1038/s41562-018-0520-3>
- Kunda, Z. (1990). The Case for Motivated Reasoning. *Psychological Bulletin*, 108(3), 480–498. <https://doi.org/10.1037/0033-2909.108.3.480>
- Leary, M. R., Diebels, K. J., Davisson, E. K., Jongman-Sereno, K. P., Isherwood, J. C., Raimi, K. T., Deffler, S. A., & Hoyle, R. H. (2017). Cognitive and interpersonal features of intellectual humility. *Personality and Social Psychology Bulletin*, 43(6), 793–813. <https://doi.org/10.1177/0146167217697695>
- Lewandowsky, S., Gignac, G. E., & Vaughan, S. (2013). The pivotal role of perceived scientific consensus in acceptance of science. *Nature Climate Change*, 3(4), 399–404. <https://doi.org/10.1038/nclimate1720>
- Light, N., Fernbach, P. M., Rabb, N., Geana, M. V., & Sloman, S. A. (2022). Knowledge overconfidence is associated with anti-consensus views on controversial scientific issues. *Science Advances*, 8(29), eabo0038. <https://doi.org/10.1126/sciadv.abo0038>
- Oreskes, N., & Conway, E. M. (2010). *Merchants of doubt: how a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. Bloomsbury Press.
- Pew Research. (2015). *Public and scientists' views on science and society*. Pew Research Center, Washington, D.C.