Introduction

Some Americans are skeptical of climate science and this may be due to the way in which climate outcomes are communicated often excluding uncertainty information for fear that users might mistake it for lack of consensus (Shackley, Ribey, Stone, & Wynne, 1999). However, evidence suggests uncertainty estimate increase trust in related domain of weather forecasting (Joslyn & LeClerc, 2012).

Few Americans are sufficiently concerned about climate outcomes. This may be due in part to a misunderstanding that as soon as we begin reducing carbon emissions, atmospheric concentrations of CO2 and global average temperature will decline at the same rate (Ranney Clark 2016). This may in turn, lead people to think that a quick fix is possible.

Targeted communication strategies may address these issues. However they may backfire among some groups (e.g. Republicans) because of the strong influence of prior beliefs (Hart, Nisbet and Myers, 2015).

Research Questions

1. Are people more trusting of climate projections that include uncertainty estimates?
2. Do people mistake uncertainty estimates for lack of agreement among climate scientists?
3. Are people more concerned when informed about the basic mechanism behind global warming, including the delay in time?
4. Do these effects differ by political party? between emission reduction and temperature fall?

Method

Task: M-Turkers (n = 1,329) either read a short paragraph on the mechanism behind global warming or not. Half of the participants who read the paragraph were informed of the delay between emission reduction and temperature fall. All participants were subsequently informed of the projected change in temperature and precipitation by the end of this century compared to the end of the last century (e.g. “the average yearly temperature will increase by 7°F.”). For half of the participants projections were accompanied by a 90% predictive interval “...the average yearly temperature will increase by 7°F...with a 90% chance that the increase will be between 4°F and 11°F.”. Finally, all participants informed their political orientation.

Results: Scientific Agreement

![Scientific Agreement Chart]

No reduction in perceived scientific agreement with probabilistic compared to deterministic forecasts.

Results: Trust

![Trust Chart]

Trust was higher for probabilistic than deterministic forecast: $F(1, 1,302) = 7.06, p < .01$ (Cohen’s $D = .142$), in particular among Republicans, $t(281) = 2.33, p = .02$ (Cohen’s $D = .186$).

Results: Urgency

![Urgency Chart]

Urgency was greatest among those given GW Info + Delay, $F(2, 1311) = 4.23, p = .015$ (Cohen’s $D = .16$), in particular among Republicans, $t(187) = 2.49, p = .04$ (Cohen’s $D = .31$).

Conclusions

- People are more trusting of climate projections that include uncertainty estimates & do not mistake outcome uncertainty for lack of scientific consensus about the fact of global warming.
- Informing people of the delay between emission reduction and the reduction in CO2 concentrations global average temperature increases perceived urgency.
- These effects are, surprisingly, stronger (rather than weaker) among Republicans.

References


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