

# Trusting an uncertain forecaster: Judgments of revised intervals in predictions of climate change

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## Abstract

Climate changes and other uncertain future outcomes are sometimes predicted using intervals (e.g., “it will be 1.4-3.1°C warmer by 2100”). Two experiments showed that revisions of interval forecasts can influence lay people’s evaluations of the forecaster. Experiment 1 showed that an expert whose revised interval forecast is narrower than the previous forecast, is trusted more than an expert whose revised interval is wider. Experiment 2 showed that revising the lower bound of the interval downwards reduced trust, while revising the upper bound upwards did not. The results indicate that even though revisions may be due to external changes, they are used as a cue for evaluating the trustworthiness of an expert.


## Introduction

- Forecasts of future events sometimes have to be revised. This can lead to challenges in risk communication. For instance, an upgraded risk causes more worry than a downgraded risk, even if the present risk level is equal (Hohle & Teigen, 2015).
- Forecast revisions may also influence perceptions of the speaker. An expert who has become more certain from T1 to T2 may be perceived as more trustworthy than an expert whose certainty has decreased.
- We investigate this claim using interval forecasts, and expect that interval forecasts that become narrower from T1 to T2 lead to more trust.

## Experiment 1

- Participants were told that a fictional climate scientist had made two reports at two different points in time (T1: 2001, T2: 2014). One example scenario is presented in Table 1.
- After reading the forecasts, participants were asked to rate whether scientists are getting better in predicting climate changes, and their degree of trust in the scientist. Also, they predicted the next forecast from the scientist, 10 years from now.

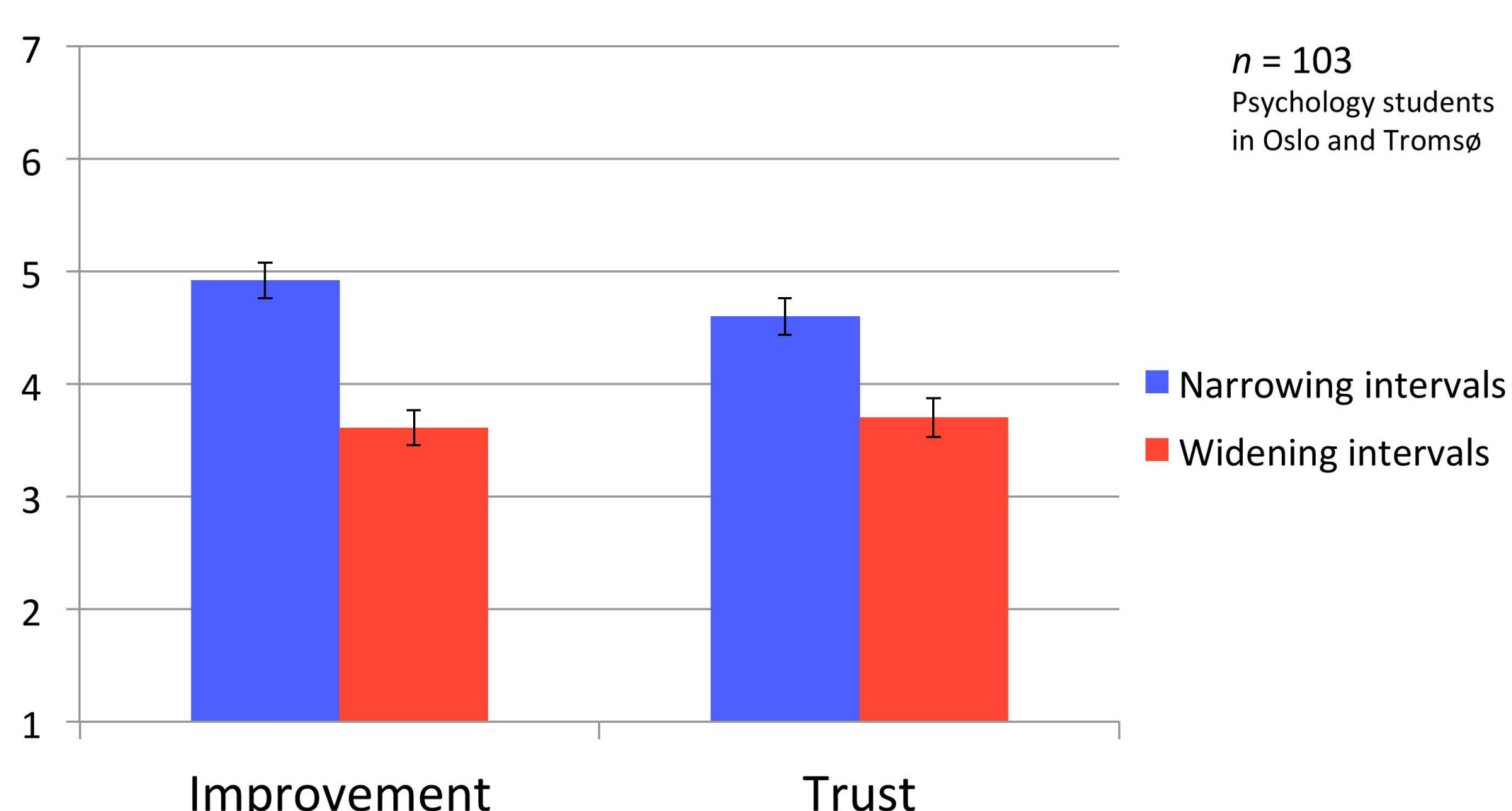
**Table 1. Interval forecasts of sea level rise in Oslo by the year 2100 presented to participants in Experiment 1, and participants’ predictions of the next forecast.**

	Expert prognosis 2001	Expert prognosis 2014	Predicted prognosis 2025 (M)
Narrowing condition	15-80 cm	25-70 cm	32-64 cm
Widening condition	35-60 cm	25-70 cm	24-75 cm

## Results

- As shown in Figure 1, participants indicated greater improvement in the ability to predict climate changes and higher trust in the scientist when the interval forecasts became narrower from T1 to T2 (both  $p$ 's < .001).
- Hence, the same interval forecast is seen as “better” and “more trustworthy” when preceded by a wider rather than a narrower interval.
- The experts’ next forecast was expected to follow the trend (i.e., narrowing intervals were expected to become even narrower, see Table 1).

**Figure 1. Ratings of improvement and trust in Experiment 1.**



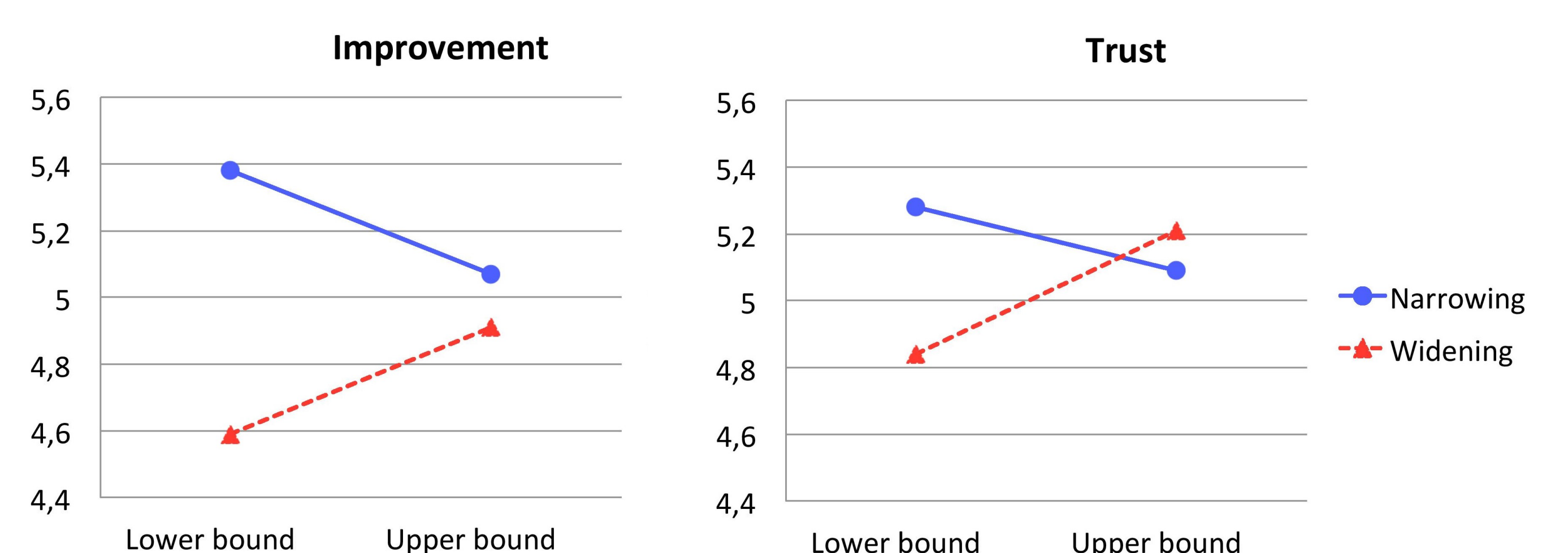
## Experiment 2

- Intervals may become wider or narrower by revising only one interval bound. We expected that the effect of narrowing vs. widening may differ depending on whether the upper or the lower bound is revised.
- Specifically, we hypothesized that widening may not lead to decreased trust when this happens to the upper bound. For example, a forecast of sea level rise with a higher upper bound can be seen as a forecast of increased risk, rather than as a forecast with increased uncertainty.
- Participants were again asked to evaluate a climate scientist who had made two reports at two points in time. The interval forecasts became wider by increasing the upper bound or by lowering the lower bound, or became narrower by increasing the lower bound or by lowering the upper bound, in a 2 x 2 between-subjects design.

## Results

- As shown in Figure 2, narrowing forecasts were seen as improvements to a greater degree than widening forecasts ( $p = .003$ ), but narrowing forecasts were not trusted more. More importantly, there were interaction effects with the bound for improvement ( $p = .044$ ) and trust ( $p = .061$ ), indicating that widening an interval on the upper bound is seen as less negative than widening on the lower bound.

**Figure 2. Ratings of improvement and trust, Experiment 2.**



## Conclusions

- Revisions of interval forecasts influenced evaluations of the speaker
- Narrowing intervals were trusted more than widening intervals
- Widening of the upper bound is perceived more positively than widening of the lower bound
- A forecast revision is used as a cue for an expert’s trustworthiness

## References

Hohle, S. M., & Teigen, K. H. (2015). Forecasting forecasts: The trend effect. *Judgment and Decision Making*, 10(5), 416-428.