Framing effect in evaluation of others' predictions

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Big Question `tl;dr`

Are people's evaluation of predictions (after the outcomes are known) influenced by the frames in which the predictions are presented?

Background

Here we focus on predictions that are about binary outcomes and are stated with a numeral probability.

Some prior studies have investigated related issues:

- Valence of predictions (e.g., "will be saved" vs. "will die") has been found to moderate the risky choice framing effect (Mandel, 2001, 2008).

- Valence of events has been shown to change people's estimates of the probability of those events (Mandel, 2005).

- Desirability of outcomes (e.g., "will be saved" vs. "will die") could moderate people's evaluation of prediction (Teigen & Nikolaisen, 2009).

☞ Suggesting that, more generally, frames could influence people's evaluation of predictions.

Frames in Predictions

We decompose predictions into **quantitative** and **qualitative** components. For example:

Imagine that Team A and Team B compete in a basketball game.

quantitative — qualitative

There is a 70% chance that Team A will win.
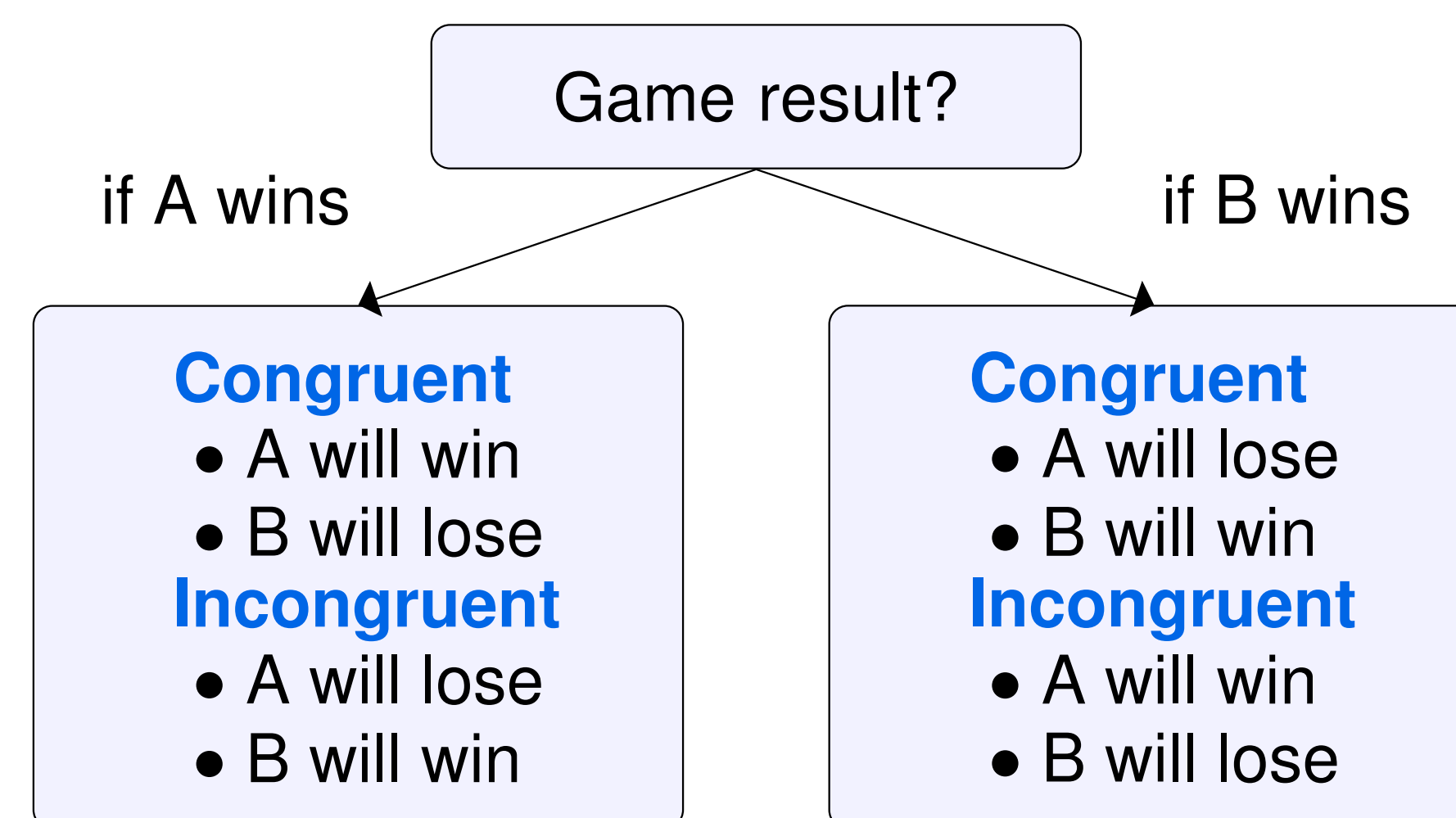
Logical equivalence

As long as no tie is allowed, the following predictions are logically equivalent:

- There is a **70%** chance that **Team A will win**.
- There is a **70%** chance that **Team B will lose**.
- There is a **30%** chance that **Team A will lose**.
- There is a **30%** chance that **Team B will win**.

Frames and congruence

Given the outcome, we classify a prediction as:

- **Congruent** — if the qualitative component is correct
- **Incongruent** — if the qualitative component is incorrect

Game result?

if A wins

Congruent
- A will win
- B will lose

Incongruent
- A will lose
- B will win

if B wins

Congruent
- A will lose
- B will win

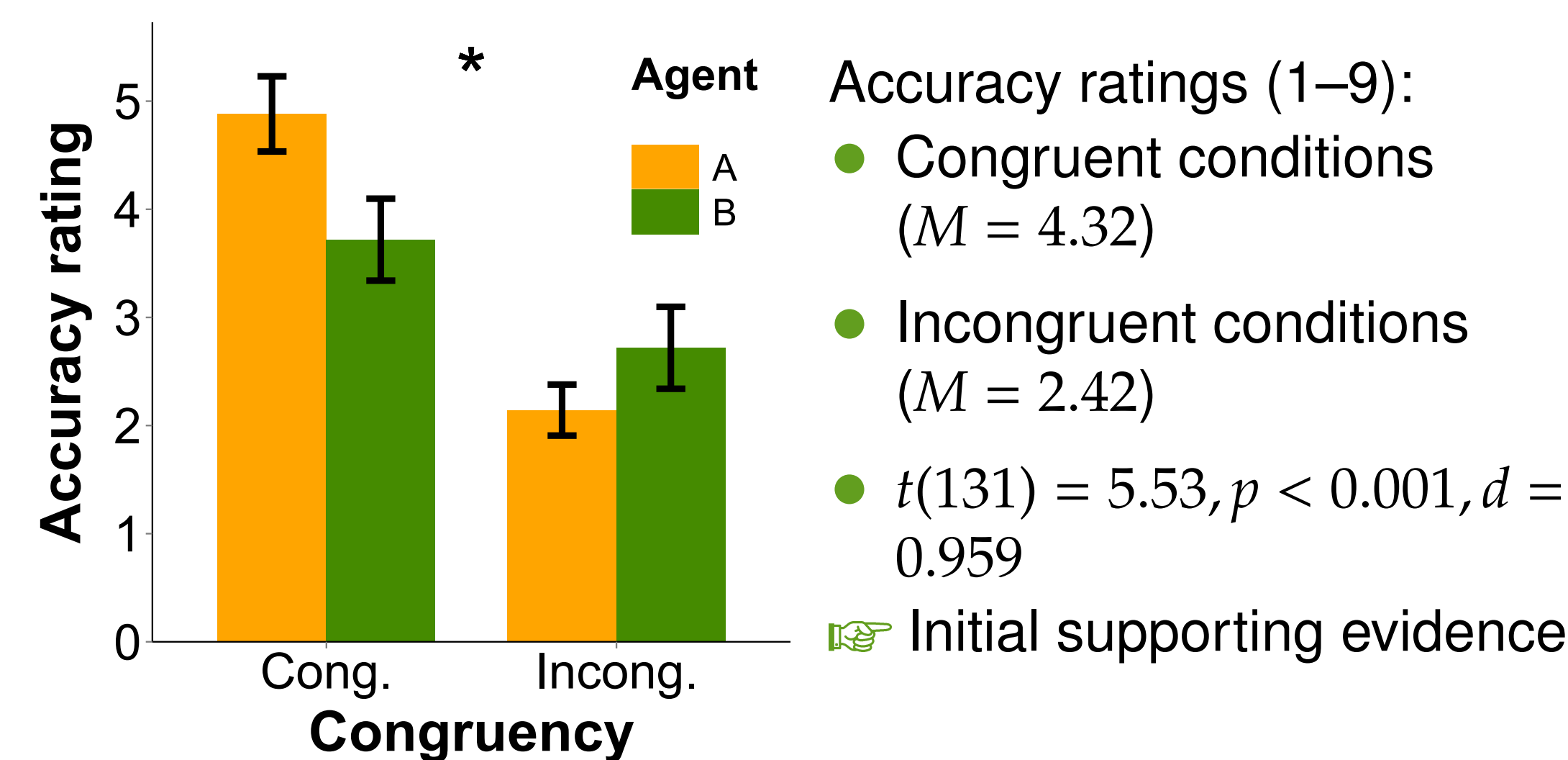**Incongruent**
- A will win
- B will lose

Hypothesis

People consider predictions that are congruent to the actual outcome to be more accurate, compared to logically equivalent incongruent predictions.

Experiment 1

Acme Inc. is a company that conducts public opinion polls in Europe. Recently there was a general election in a small European country. The two major parties involved were the NRT and CTS parties. Other than these two major parties, all other parties are much smaller and had no chance of winning the election. Before the election Acme Inc. had predicted that the... **in 4 between-subjects conditions**:

- **[Congru.]** CTS party had a 20 percent chance of winning.
- **[Congru.]** NRT party had a 20 percent chance of losing.
- **[Incong.]** CTS party had an 80 percent chance of losing.
- **[Incong.]** NRT party had an 80 percent chance of winning.

Results from the election showed that the CTS party has won.
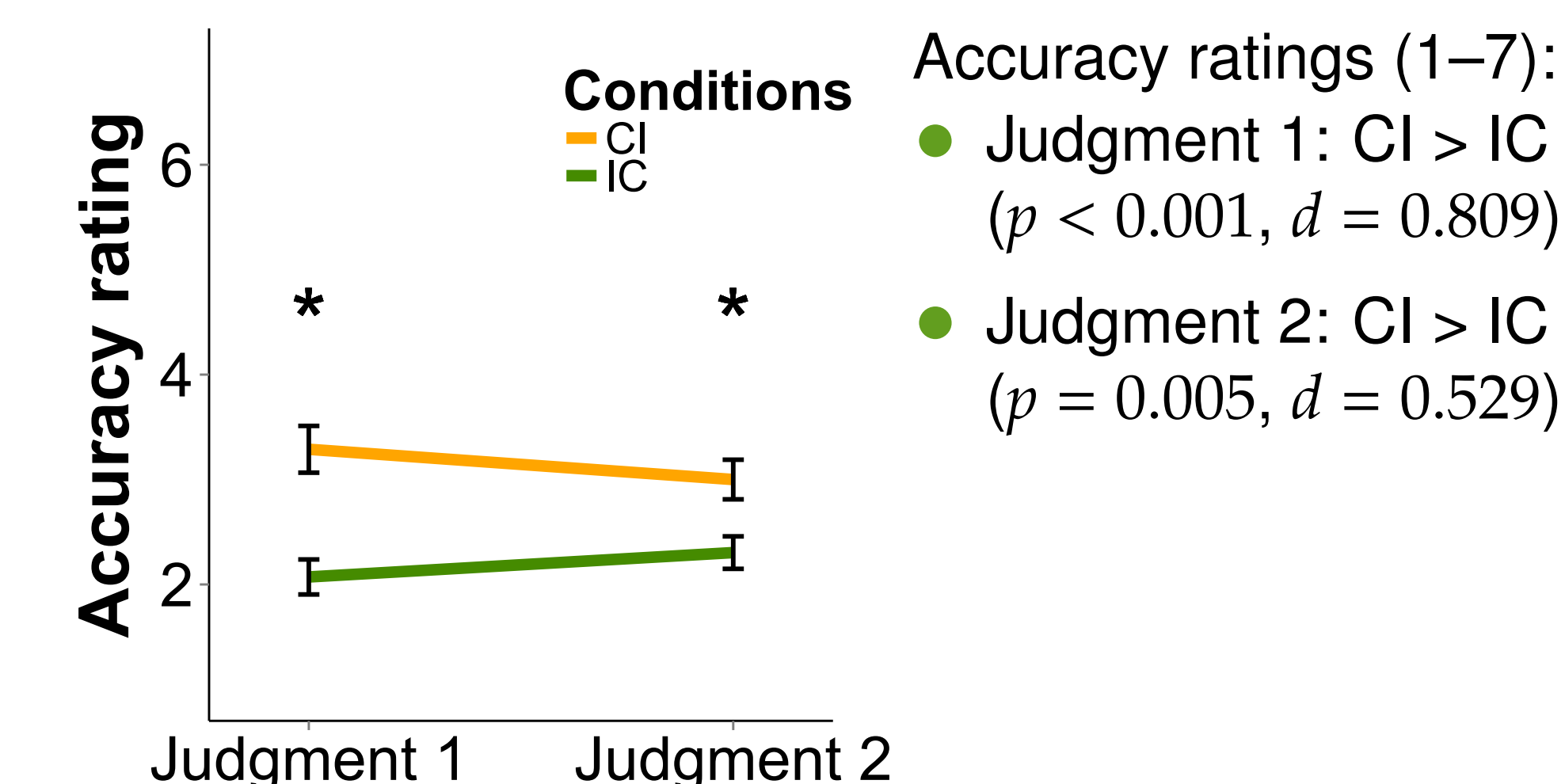
How accurate was the prediction?

Results

Accuracy ratings (1–9):
- Congruent conditions ($M = 4.32$)
- Incongruent conditions ($M = 2.42$)
- $t(131) = 5.53, p < 0.001, d = 0.959$
- ☞ Initial supporting evidence

Experiment 2

Objectives To test whether the result still holds if participants are aware of both ways that a prediction can be framed; and to examine whether naïve subjects do indeed consider congruent and incongruent frames to be logically equivalent.

Procedure

- Condition CI: participants who first read a **C**ongruent frame then an **I**ncongruent frame; Condition IC: opposite order.

- Give participants a prediction stated in either a congruent or incongruent frame; elicit their accuracy rating (Judgment 1).

- Restate the prediction using the opposite frame while bringing to their attention their correspondence.

- Elicit their accuracy rating again (Judgment 2).

- We also asked, "Do you agree that these two ways of stating the prediction are logically the same?"

Results

Accuracy ratings (1–7):
- Judgment 1: CI > IC ($p < 0.001, d = 0.809$)
- Judgment 2: CI > IC ($p = 0.005, d = 0.529$)

Experiment 2 (cont.)

- The prediction in the congruent frame was rated as more accurate, even after logical equivalence was explicitly brought to participants' attention.

- Most participants indeed agreed that the two frames were logically equivalent, with 73.9% responding with "Strongly Agree" (1) or "Agree" (2) ($M = 2.2$; scale was from 1–7).

Experiment 3

Objective To examine in what ways do responses deviate from the normative account (since prior experiments only contrasted people's judgments).

Procedure

- Similar cover story as Experiment 1 (except that all predictions were about the NRT party).

- 2 between-subjects factors:
  - Prediction of "winning" or "losing".
  - Percentage values used: 2%, 10%, 25%, 45%, 50%, 55%, 75%, 90%, 98%.

- Outcome (all conditions): the NRT party won.

- We then asked: How accurate was the prediction?

- Accuracy rating should be positively correlated to strength of belief in the Winning condition; and negatively correlated in the Losing condition.

Results
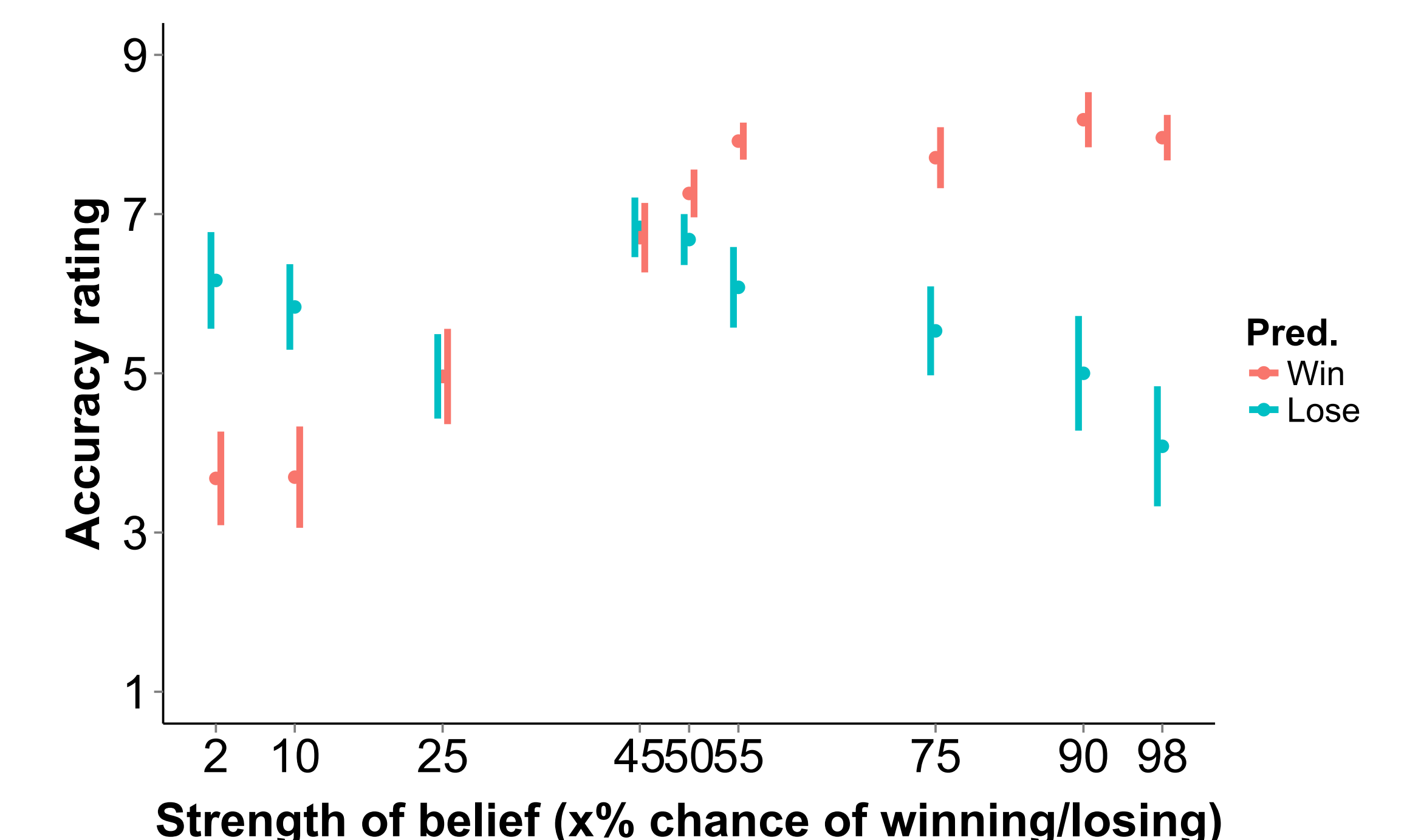
☞ The non-monotonicity of the responses in the Lose condition seems to suggest that people are not collectively evaluating these predictions normatively.

Conclusion `tl;dr`

- Predictions made in congruent frames were evaluated as more accurate compared to logically equivalent predictions made in incongruent frames.

- Being explicitly informed of and having processed the alternative frames do not eliminate this effect.

- There is initial evidence that the effect is driven by people's non-normative responses when the prediction is incongruent with the outcome.

References

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