

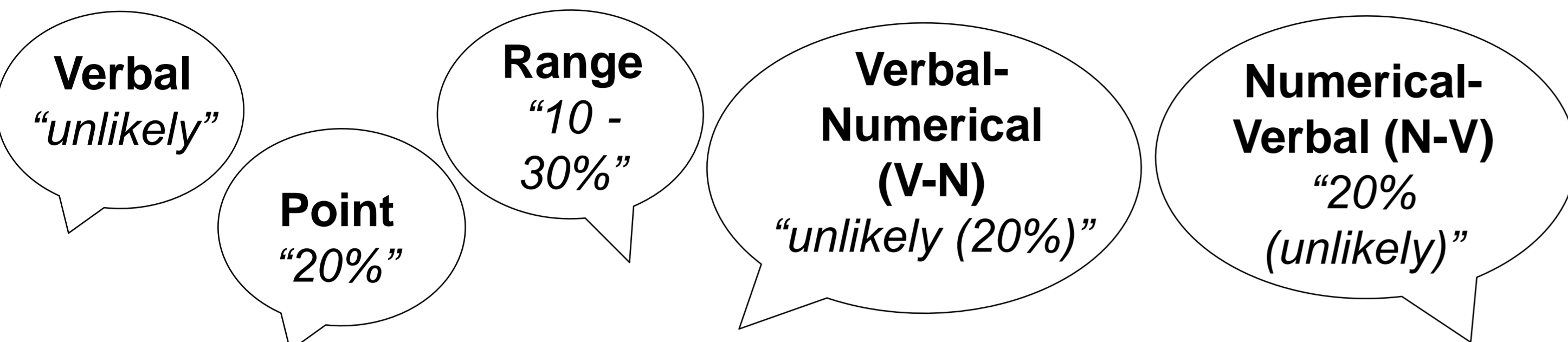
# Maintaining credibility when communicating uncertainty: the role of directionality in 'erroneous' predictions

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- After an 'unlikely' event occurs (an 'erroneous' prediction), a communicator who used verbal format is perceived as less credible and less correct than one who uses a numerical format<sup>1,2</sup>.
- However, format effects are not consistently found for high probability expressions<sup>1</sup>.
- Directionality<sup>3,4</sup> can explain difference – 'unlikely' focuses attention on non-occurrence of the outcome (negative directionality), not its occurrence (positive directionality). Numerical expressions are biased towards positively directional interpretations<sup>4</sup>.
- Test a 'directionality-outcome congruency' account, whereby a communicator is evaluated against the extent to which a phrase's directionality and outcome matches.

## Method

	VPE (-ve)	VPE (+ve)	Numerical Range
<b>Low Probability</b>	'doubtful' (25%)	'small chance' (30.5%)	'10 – 30% likelihood'
<b>High Probability</b>	'not entirely definite' (70%)	'good chance' (80%)	'70 – 90% likelihood'

- Congruency between VPE directionality & event outcome
- Verbal probability expressions (VPEs) selected from pilot studies to ensure similar numerical translations (in brackets).

## Procedure (N=436)

### 1. Read Risk Communication

The River Wayston is currently in flood and floodwater is expected. Experts from Wayston Geological Centre are communicating information about the flood.

An expert has suggested that given the river's situation and recent weather, it is **doubtful** that the floodwater will extend 7km.

*Incongruent condition, low probability*

### 2. Trust / Expertise Ratings

### 3. Read Event Outcome ('Erroneous' Prediction)

Low probability – outcome occurred

High probability – outcome did not occur

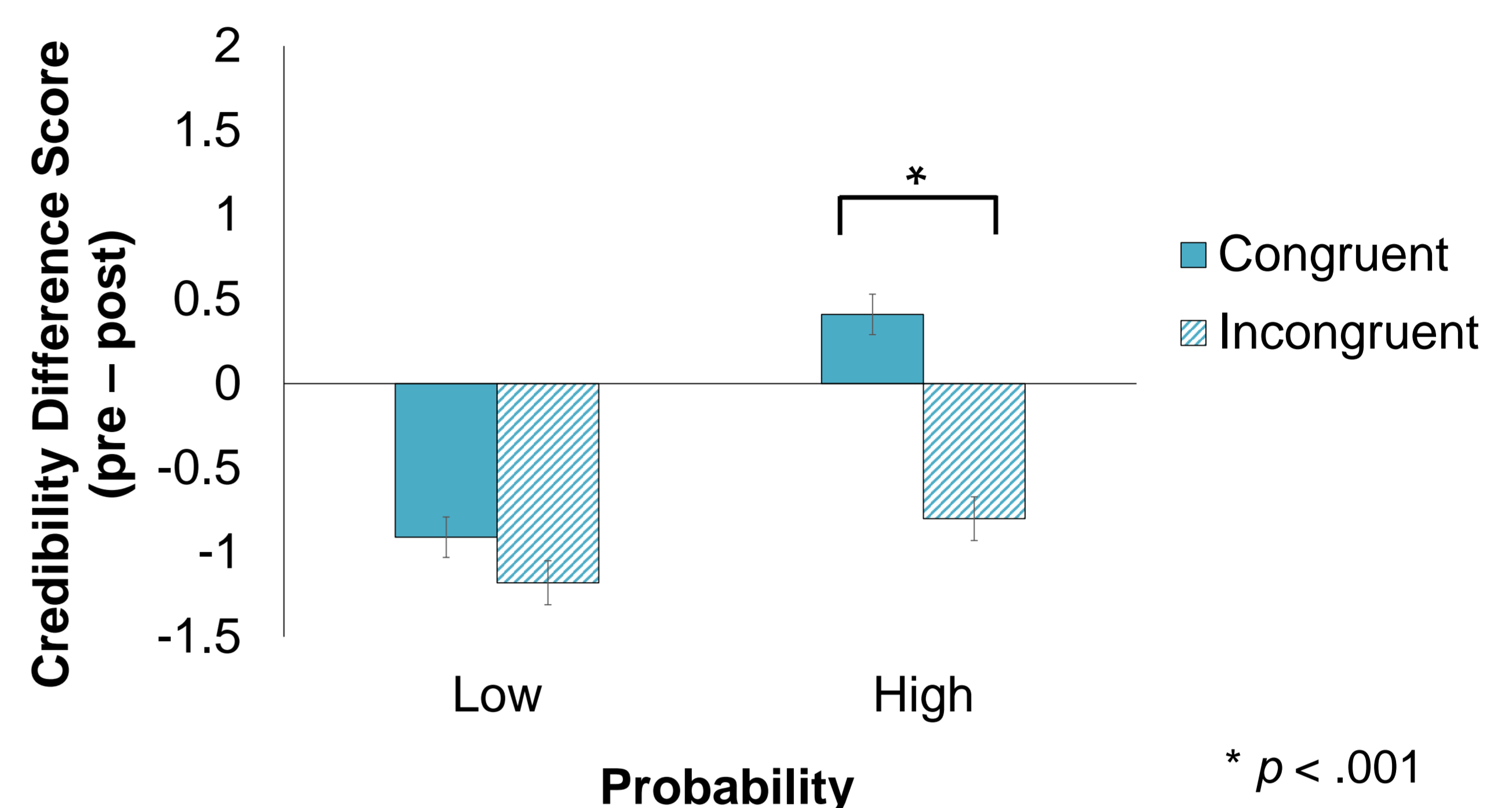
### 4. Trust / Expertise / Correctness / Surprise Ratings

## Results

- Congruency variable created – reflects whether directionality of the VPE was (in)congruent with event outcome

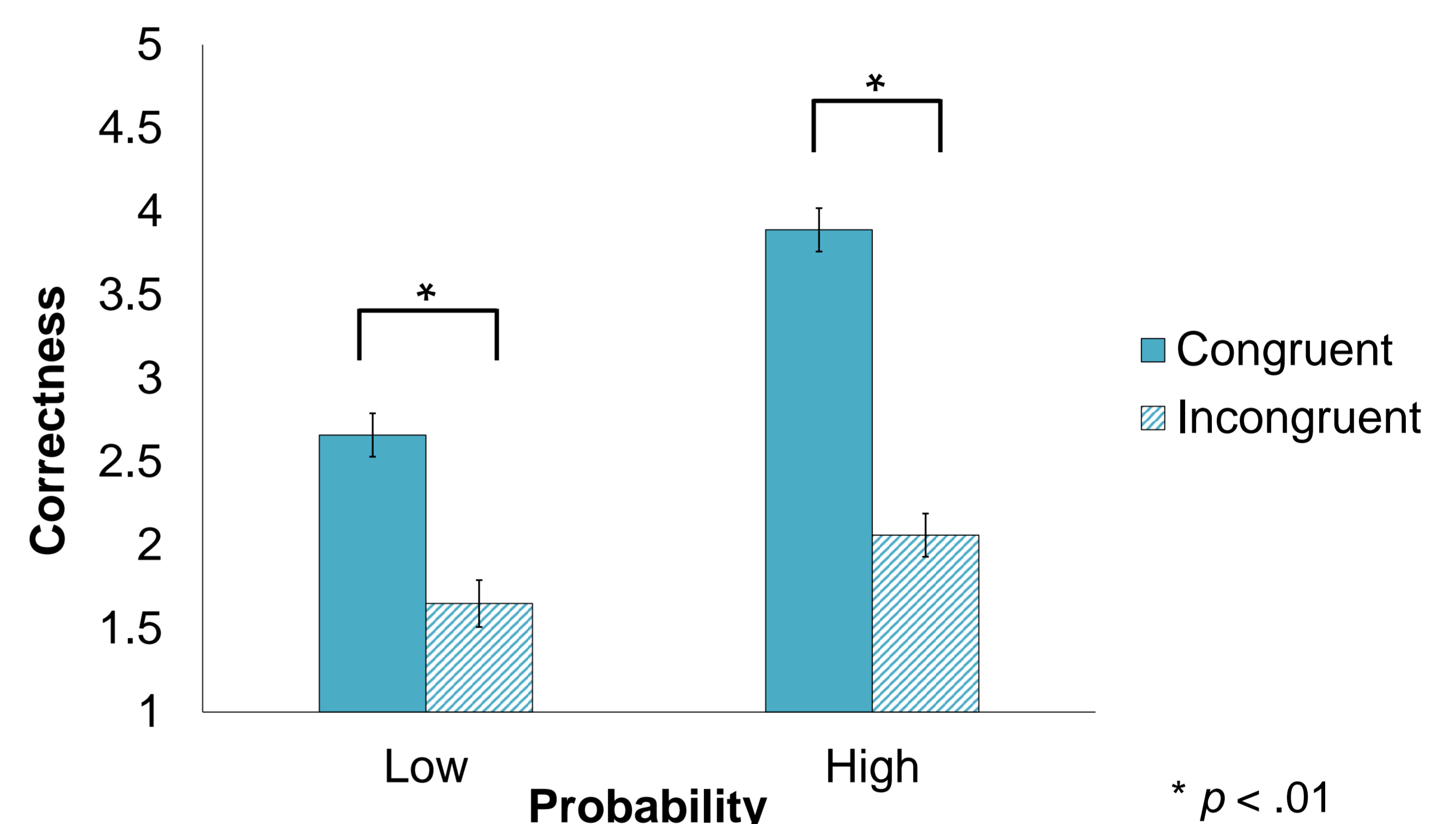
### Credibility Ratings

- Credibility = average trust and expertise ratings for pre and post outcome (both  $\alpha \geq .85$ )



- Congruency  $\times$  probability interaction: use of incongruent VPE leads to greater loss in credibility, but only in high probability domain.

### Correctness Ratings



- Congruency  $\times$  probability interaction: use of incongruent VPE perceived as less correct in both probability domains, with a larger effect of congruency in high probability domain.

### Surprise Ratings

- Main effect of congruency on surprise ratings ( $p < .05$ ) – higher levels of surprise observed for incongruent VPEs.

## Conclusions

- VPEs communicate additional information, over and above conveying likelihood, which has implications for credibility.
- Directionality drives expectations about events, resulting in more negative perceptions when outcome is incongruent with directionality of VPE.
- Smaller effect of congruency in low probability condition could result from the ambiguous directionality of 'small chance'<sup>4</sup>.

## References

1. Jenkins, S. C., Harris, A. J. L., & Lark, R. M. (2017). Maintaining credibility when communicating uncertainty: The role of communication format. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. J. Davelaar (Eds.), *Proceedings of the 39th Annual Conference of the Cognitive Science Society* (pp. 582–587). Austin, TX: Cognitive Science Society.  
 2. Jenkins, S. C., Harris, A. J. L., & Lark, R. M. (2018). When unlikely outcomes occur: The role of communication format in maintaining communicator credibility. *Journal of Risk Research*, Advance online publication, doi.org/10.1080/13669877.2018.1440415.  
 3. Teigen, K. H., & Brun, W. (1995). Yes, but it is uncertain: Direction and communicative intention of verbal probabilistic terms. *Acta Psychologica*, 88(3), 233–258.  
 4. Teigen, K. H., & Brun, W. (2000). Ambiguous probabilities: When does  $p = 0.3$  reflect a possibility, and when does it express a doubt? *Journal of Behavioral Decision Making*, 13(3), 345–362.