



Study 2

-1.5

Summary

- People are often too confident in the accuracy of their beliefs.
- Past research suggests that this form of overconfidence can be reduced by asking people to provide a belief distribution over all possible outcomes, as doing so forces them to confront the fact that many different outcomes could materialize (Haran, Moore, & Morewedge, 2010; Moore, 2020).
- In 10 pre-registered experiments (N = 11, 157), we manipulated whether participants were asked to provide a belief distribution before indicating their confidence in their judgments.
- Across different domains and different measures of confidence, we were surprised to find that providing a belief distribution usually *increases* (over)confidence, as people's distributions often serve to reinforce their existing beliefs.

Poster session: Friday Feb. 11, 9:30-10:30am ET

Zoom: https://upenn.zoom.us/j/97996487507

Does Providing a Belief Distribution Truly Reduce Overconfidence?

Pre-registrations, data, and materials available at: https://researchbox.org/314&PEER REVIEW passcode=IUVUQY

Study Procedure

Participants make predictions about upcoming sports games or other participants' responses to preference/behavior questions.



Results (Confidence Rating) *The results of other measures show the same pattern

Study 2	Titans vs. Ravens	• • • • • • • • • • • • • • • • • • •
	Patriots vs. Texans	→
	Dolphins vs. Broncos	• • • • • • • • • • • • • • • • • • •
	Packers vs. Colts	• • • • • • • • • • • • • • • • • • •
Study 3/Best Estimate First	Thanksgiving vs. Christmas	• • • • • • • • • • • • • • • • • • •
	See the future vs. Change the past	•
	1 wish today vs. 3 wishes in 5 years	
	More money vs. More time	
Study 3/Best Estimate Last	Thanksgiving vs. Christmas	
	See the future vs. Change the past	
	1 wish today vs. 3 wishes in 5 years	
	More money vs. More time	
Study 4/High Precision	Pasta vs. Pizza	
	Mountains vs. Beach	
	Spending vs. Saving	•
	Memory vs. IQ	
Study 4/Low Precision	Pasta vs. Pizza	
	Mountains vs. Beach	
	Spending vs. Saving	
	Memory vs. IQ	
Study 5/Extreme Answer	Milk chocolate vs. Wasabi chocolate	
	Chocolate vs. Cheese ice cream	
	TV (Yes vs. No)	•
Study 5/Moderate Answer	Milk chocolate vs. Dark chocolate	• • • • • • • • • • • • • • • • • • •
	Chocolate vs. Vanilla ice cream	
	iPad (Yes vs. No)	
Study 6	Steelers vs. Ravens	
	Colts vs. Lions	
	Chargers vs. Broncos	
	49ers vs. Seahawks	•
Study 7	Pancakes vs. Waffles	
	Invisibility vs. Time travel	
	Music vs. Podcast	
	Coffee smell vs. Cookies smell	
Study 8	Type fast vs. Read fast	
	Morning person vs. Night person	• • • • • • • • • • • • • • • • • • •
	Money vs. Fame	
	Laundry vs. Dishes	• • • • • • • • • • • • • • • • • • •
Study 9	Clippers vs. Bulls	• • • • • • • • • • • • • • • • • • •
	Bucks vs. Jazz	
	Thunder vs. Nuggets	• • • • • • • • • • • • • • • • • • •
	Grizzlies vs. Lakers	●
Study 10	Pistons vs. Grizzlies	• • • • • • • • • • • • • • • • • • •
	Suns vs. Pelicans	
	Mavericks vs. Rockets	• • • • • • • • • • • • • • • • • • •
	Jazz vs. Clippers	
	Jazz vs. Clippers	

Belief Distribution condition increases confidence compared to the Control condition

Dependent Measures:

. Confidence in the best estimate prediction (9-point scale)

2. Likelihood of the prediction being correct (0% - 100%)

(in some studies: incentivized wager measure)

0.40 [0.10, 0.69] 0.25 [-0.03, 0.53] .33 [0.04, 0.62] 0.50 [0.22, 0.78] 0.20 [0.06, 0.35] 0.25 [0.11, 0.40] 0.16 [0.01, 0.31] 0.10 [-0.05, 0.24] 0.10 [-0.04, 0.25] 0.15 [0.00, 0.29] 0.11 [-0.03, 0.26] 0.10 [-0.04, 0.25] 0.04 [-0.12, 0.20] -0.03 [-0.19, 0.13] -0.02 [-0.18, 0.13] 0.09 [-0.07, 0.25] 0.04 [-0.12, 0.20] -0.10 [-0.26, 0.06] -0.01 [-0.17, 0.14] 0.13 [-0.03, 0.29] 0.11 [-0.04, 0.27] 0.14 [-0.02, 0.30] 0.27 [0.11, 0.42] 0.19 [0.04, 0.35] 0.10 [-0.06, 0.25] 0.27 [0.11, 0.42] 0.26 [0.10, 0.42] 0.32 [0.16, 0.49] 0.33 [0.16, 0.49] 0.29 [0.12, 0.45] 0.13 [-0.03, 0.29] 0.10 [-0.06, 0.26] 0.06 [-0.10, 0.21] 0.20 [0.05, 0.36] 0.13 [-0.03, 0.28] 0.20 [0.05, 0.36] 0.07 [-0.09, 0.22] 0.17 [0.01, 0.32] 0.22 [0.05, 0.39] 0.33 [0.17, 0.50] 0.27 [0.11, 0.44] 0.17 [0.00, 0.34] 0.29 [0.11, 0.47] 0.19 [0.02, 0.37] 0.25 [0.08, 0.43] 0.29 [0.11, 0.47]

Surprisingly (to us at least), giving a belief distribution usually exerts a small but *positive* effect on overconfidence (directionally in 42 of 46 comparisons, and significantly so in 25 comparisons).

Results are robust to:

- ✓ Different prediction domains
- Eliciting distribution before or after giving the best estimate prediction (Study 3)
- \checkmark Whether the prediction took the form of a point estimate or a range (Study 4)
- \checkmark Whether the answer to the prediction question was extreme or moderate (Study 5)
- ✓ Different measures

Note. Cohen's *d*s between the Belief Distribution condition and the Control condition (Belief Distribution condition minus Control condition) on the confidence rating question. A positive sign reflects that the Belief Distribution condition increases confidence compared to the Control condition; a **negative** sign reflects that the Belief Distribution condition reduces confidence compared to the Control condition.

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Participants in our studies were overconfident.

- We compared how likely participants said their predictions were to be accurate to how accurate those predictions actually were.
- Their likelihood estimates were overconfident in every condition of every study.
- Thus, for all studies, whenever an intervention increased confidence, it also increased overconfidence.

Mechanism

This effect seems to occur because people build belief distributions that reinforce their initial beliefs.

This effect does not emerge

- (1) When people are asked to merely consider all possible outcomes (Studies 8-10), or
- (2) When they are asked how surprised they would be if each outcome were to arise (Study 8).

For feedback or to request a copy of the paper, please email Beidi Hu at beidihu@wharton.upenn.edu.

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