

Is the Risky-Choice Framing Effect an Artifact of Mismatched Options?

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RESEARCH QUESTION

- Does the risky-choice framing effect remain once Gist is accounted for?

ANSWER

- Yes, in our study of apples-to-apples comparisons.

More Detail

- The risky-choice framing effect (FE) can be eliminated, amplified, or reversed by completing or truncating the descriptions of the options in different ways (Broniatowski and Reyna, 2018; B&R).
- We reanalyzed the comparisons compiled by B&R. When we controlled for the Gist of the options, the FE was small and not significant.
- We extended these results in a large ($N = 949$) preregistered MTurk study with a more complete set of comparisons. There was a large effect of Gist, but a large FE remained.

BACKGROUND and FRAMEWORK

- The standard Asian Disease Problem (ADP) has the following options:

	Sure Option	With Program A, 200 people will be saved.
Gain Frame	Sure Option	With Program A, 200 people will be saved.
	Risky Option	With Program B, there is a 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved.
Loss Frame	Sure Option	With Program A, 400 people will die.
	Risky Option	With Program B, there is a 1/3 probability that no people will die and a 2/3 probability that 600 people will die.

- In principle, an option description can include the good outcome only (Gist = +1), the bad outcome only (Gist = -1) or both (Gist = 0). Preference for the risky option is a function of $Gist(Risky) - Gist(Sure)$. These Gist differences are shown in cells G1–G9 and L1–L9 of the **Gist Tables** below.
- In the standard ADP, the risky option is complete in the gain frame (Gist = +1) and only the bad outcome in the loss frame (Gist = -1), leading to the usual FE. This mismatched comparison corresponds to G4 vs. L6 (in **blue**).
- Completing the sure option (e.g., 200 saved and 400 not saved in the gain frame) can eliminate the FE (G5 vs. L5, in **gray**). This is a matched, **apples-to-apples** comparison.
- Other mismatched comparisons can amplify (**green**) or reverse (**purple**) the FE.
- B&R reported results for 7 of the 81 (9 x 9) possible comparisons.

GAINS		Sure Option		
Risky Option		Good (+1)	Both (0)	Bad (-1)
Good (+1)		G1 (0)	G2 (+1)	G3 (+2)
Both (0)		G4 (-1) Std.	G5 (0)	G6 (+1)
Bad (-1)		G7 (-2)	G8 (-1)	G9 (0)

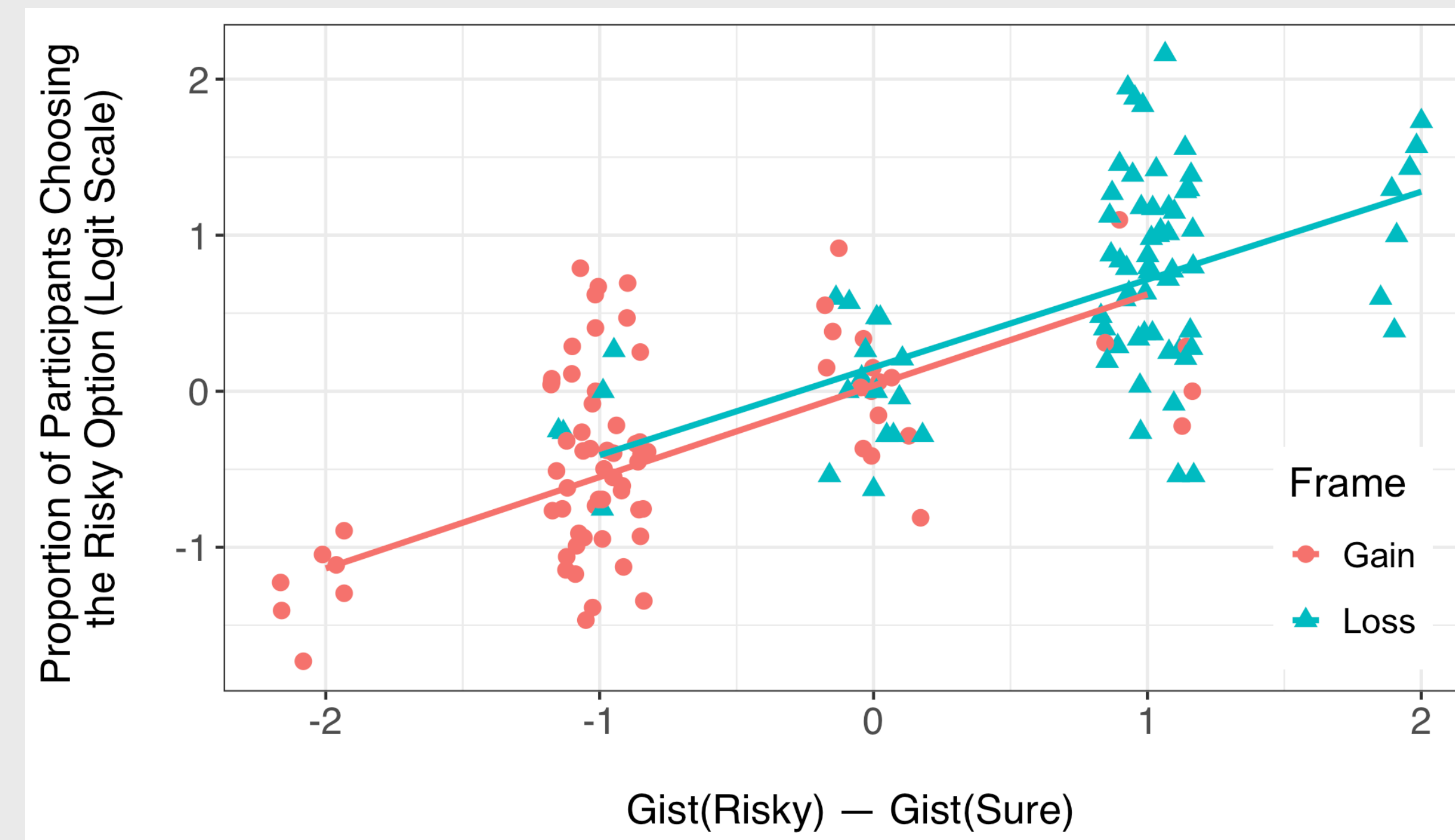
LOSSES		Sure Option		
Risky Option		Good (+1)	Both (0)	Bad (-1)
Good (+1)		L1 (0)	L2 (+1)	L3 (+2)
Both (0)		L4 (-1)	L5 (0)	L6 (+1) Std.
Bad (-1)		L7 (-2)	L8 (-1)	L9 (0)

In cells G1–G9 and L1–L9, higher numbers indicate stronger Gist-based preferences for the risky option.

REANALYSIS of PREVIOUS STUDIES

- We used mixed-effects logistic regression to reanalyze all of the FE comparisons compiled by B&R, including 34 nonstandard comparisons of 6 types.

Proportion of Participants Choosing the Risky Option in 14 Cells as a Function of Gist, Frame, and Their Interaction



- Slopes:** There was a strong effect of Gist, $b = 0.521, p < .001$.
- Distance between the lines:** The effect of Frame was not quite significant after controlling for Gist, $b = 0.264, p = 0.062$. This effect disappeared if a random slope for Gist was used, because Gist and Frame were so confounded.
- Mix of comparisons:** Most comparisons were from the standard ADP. No comparisons involved cells G3, G8, L2, or L7. Studies varied in many other ways.
- These results warranted replication in a more balanced design.

NEW STUDY

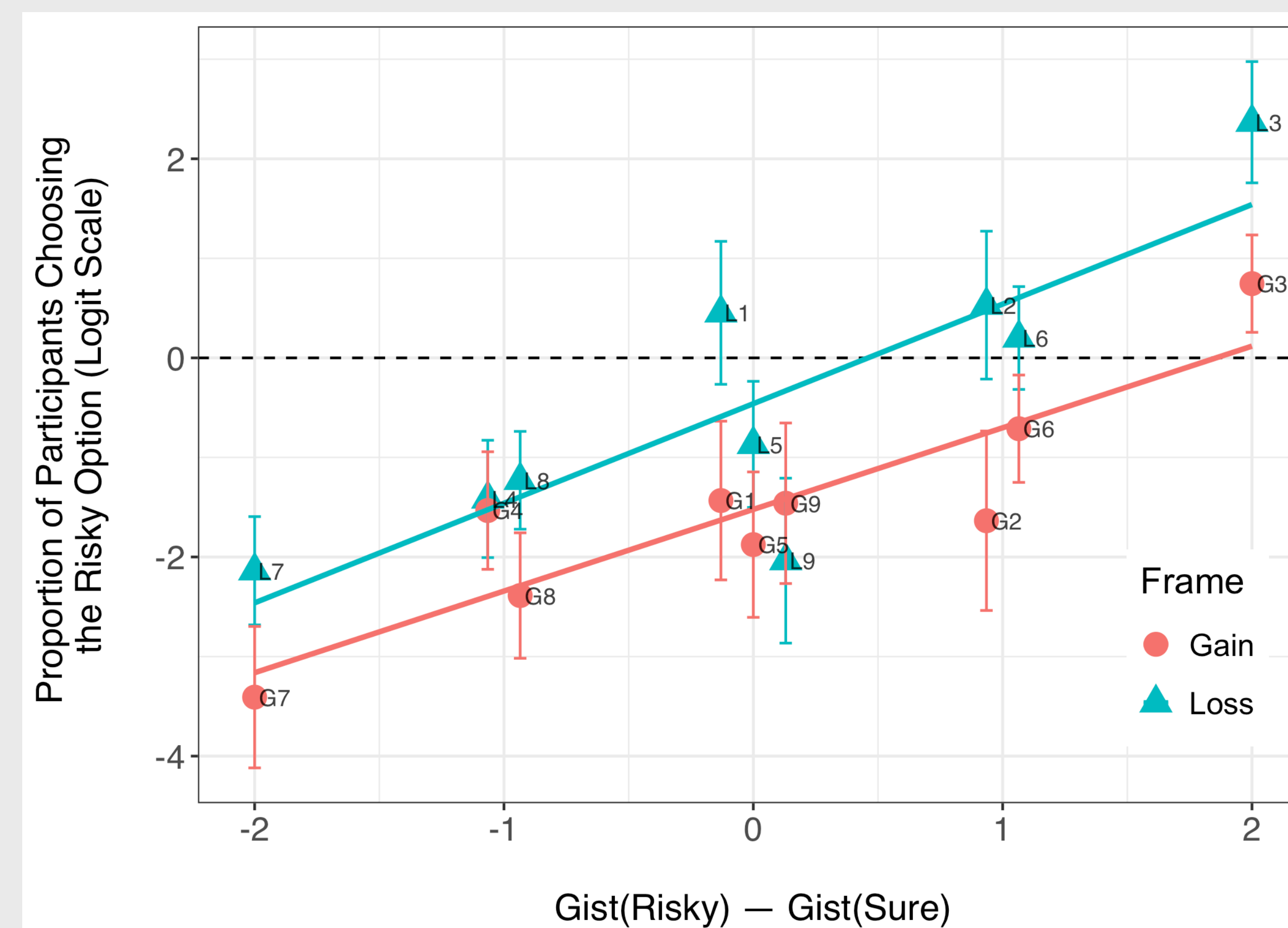
METHOD

- 949 MTurk workers were each assigned to one of the 18 cells (G1–G9 and L1–L9).
- Each participant made 4 choices (disease, investment, wildfire, and drought).

RESULTS

- We again used mixed-effects logistic regression to predict choice of the risky option.

Proportion of Participants Choosing the Risky Option in 18 Cells as a Function of Gist, Frame, and Their Interaction

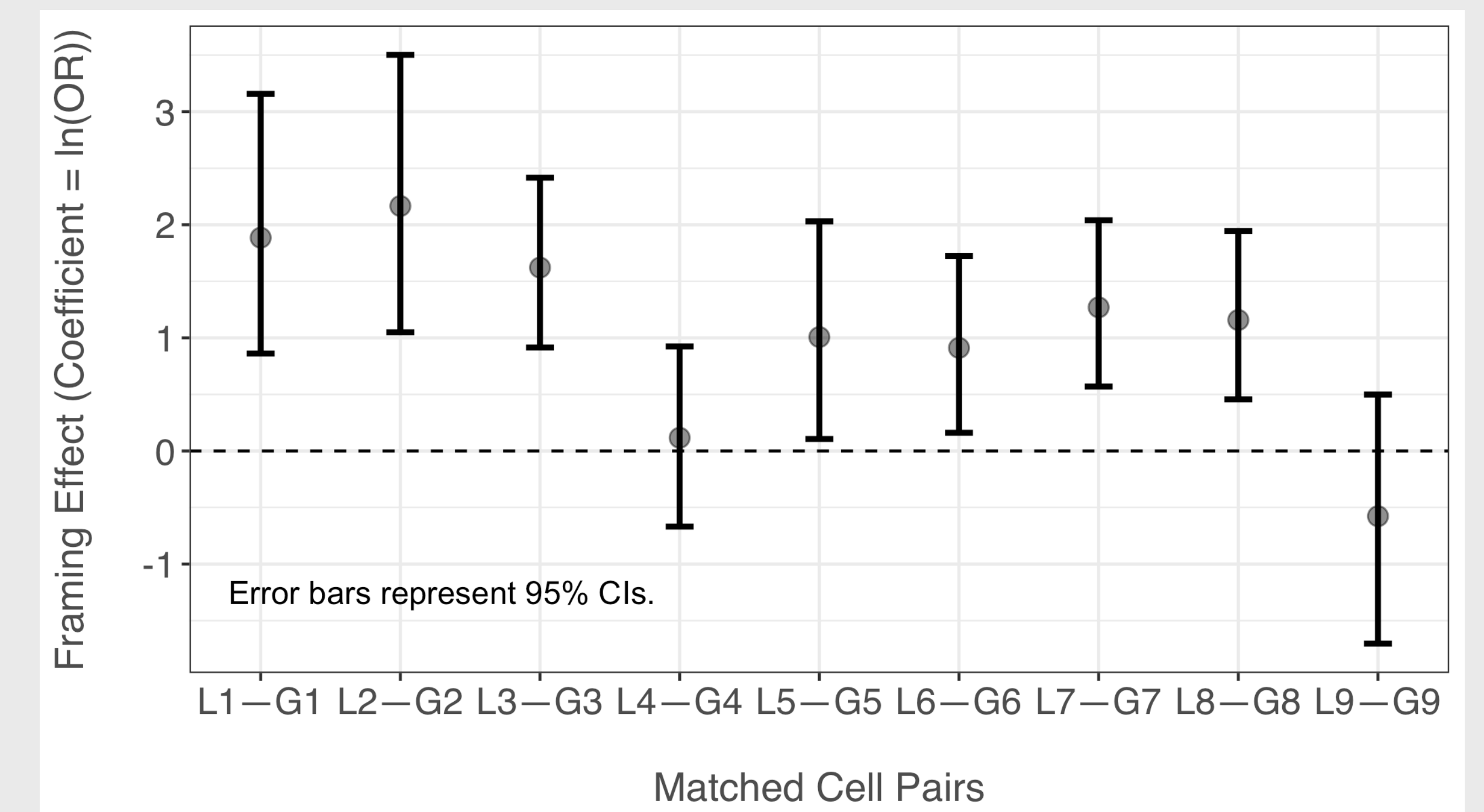


- Slopes:** As before, there was a strong effect of Gist, $b = 0.955, p < .001$.
- Distance between the lines:** In contrast to the results for previous studies, the effect of Frame remained strong when we controlled for Gist, $b = 1.134, p < .001$.

Comparisons for Matched Cells

- For each pair of matched cells (e.g., L1–G1), we conducted a mixed-effects logistic regression with Frame as the only predictor.
- The Gist Tables predict that the FE should be zero in these comparisons.

Framing Effects for Apples-to-Apples Comparisons Based on Matched Cells

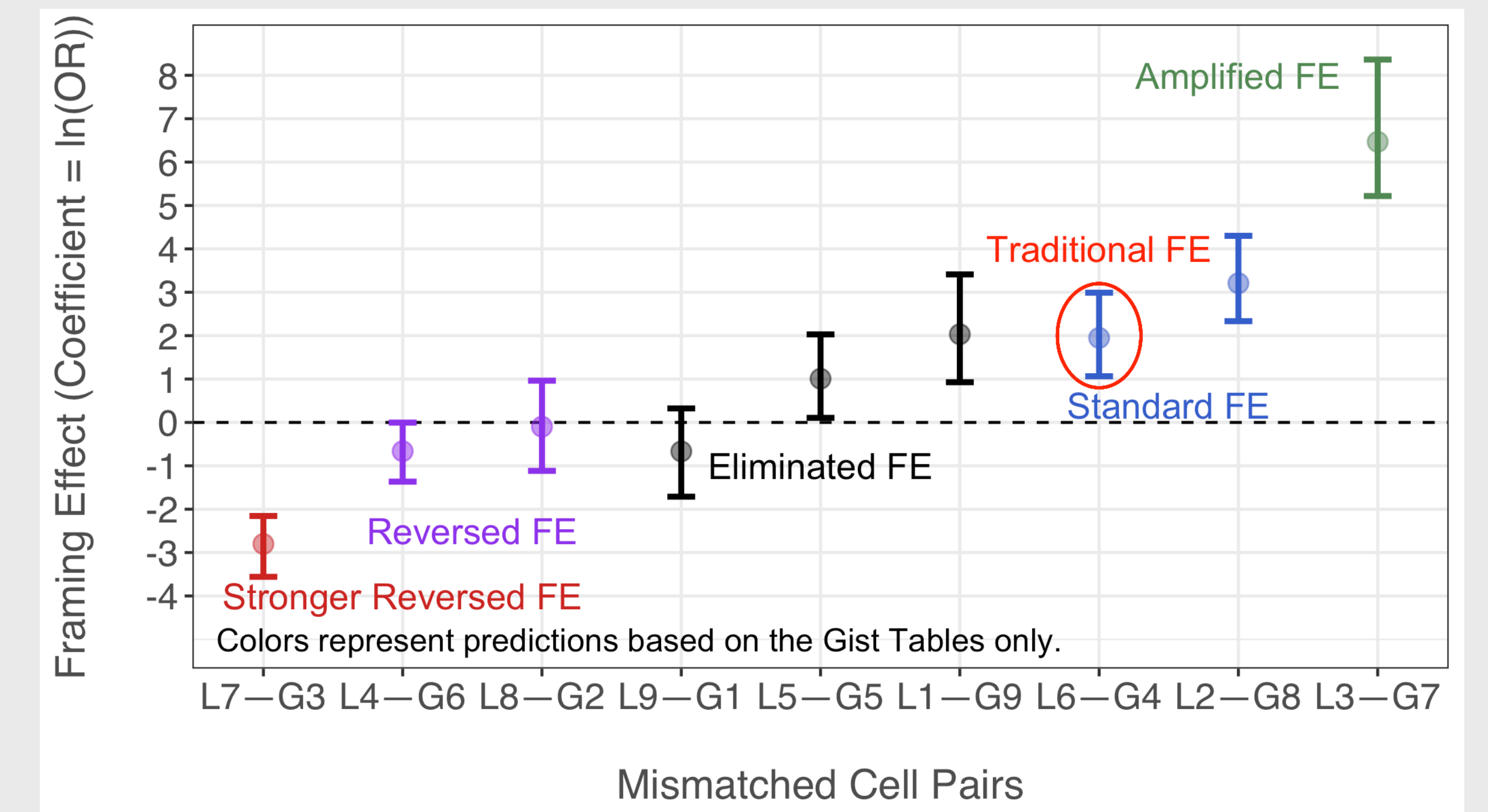


- In 7 of 9 apples-to-apples comparisons, the FE was significant.

Comparisons for Mismatched Cells

- We conducted similar analyses for 9 comparisons like those in B&R.
- These included the traditional ADP (L6–G4) and two new comparisons (L2–G8 and L7–G3).

Variable Framing Effects Based on Mismatched Cells



- The FE may be eliminated, amplified, or reversed, depending on the comparison.
- These results are consistent with B&R's results, though the entire pattern is shifted upward, toward more positive FEs.
- The new mismatched comparison L7–G3 yielded the strongest reversed FE, as predicted by the Gist Tables.

CONCLUSION

- Gist clearly matters, but we still found sizable FEs when we controlled for Gist.

Reference

Broniatowski, D. A., & Reyna, V. F. (2018). A formal model of fuzzy-trace theory: Variations on framing effects and the Allais paradox. *Decision*, 5(4), 205–252.

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