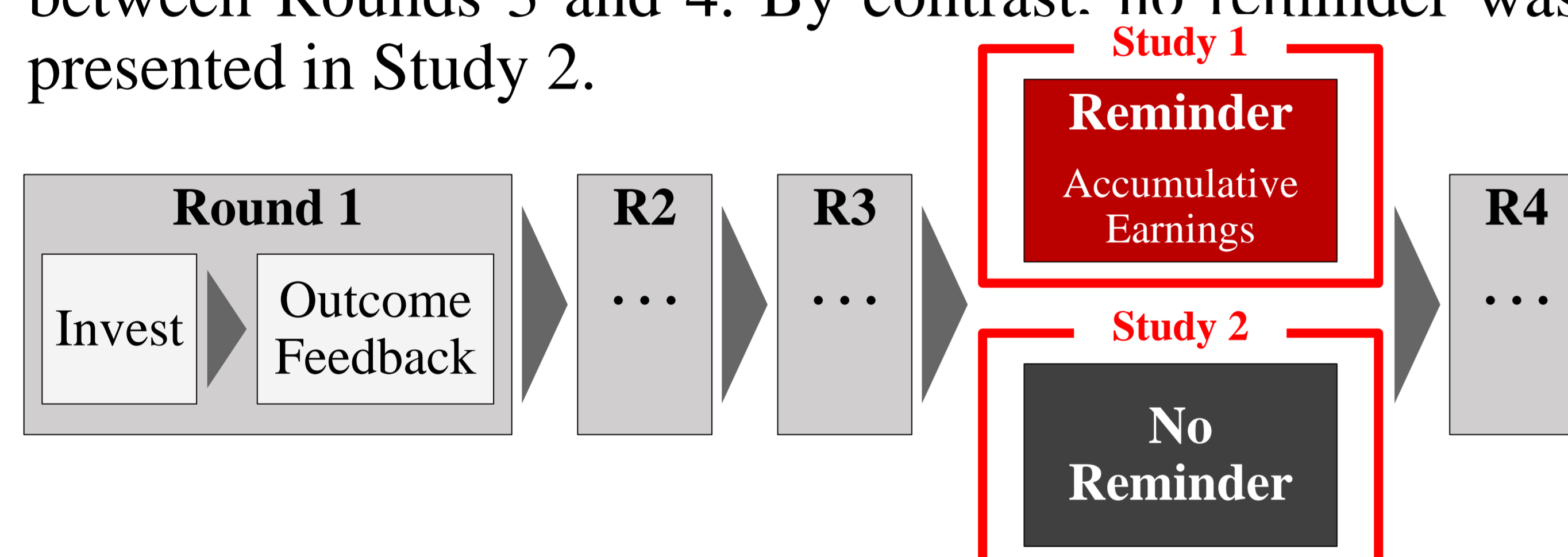


## Theoretical Backgrounds

- Studies have reported contradictory findings regarding responses to prior losses: people increased risk-taking in some studies -[2]-, and decreased risk-taking in other studies -[3]-, following a loss.
- **Cumulative Prospect Theory (CPT)** combined with **reference point updating** can reconcile the seemingly contradictory evidence. Imas (2016) -[1]- demonstrated that people increase risk-taking only if losses remain in their current mental account (i.e., **paper losses**), as opposed to their previous mental account (i.e., **realized losses**).
- Extending this framework, we test whether loss chasing (with paper losses) is moderated by the expected recoverability of accumulated losses. Specifically, we test whether loss chasing is reduced when risk is negatively skewed (as opposed to positively skewed), and when the last investment round is unknown (as opposed to known) to participants.

## Experimental Paradigms

- The investment session consists of four rounds. In each round, participants could invest up to \$0.25, and they immediately learned the investment outcome. In Study 1, participants were reminded of their cumulated earnings between Rounds 3 and 4. By contrast, no reminder was presented in Study 2.



- **Study 1:** Participants were randomly assigned to invest in either positively-skewed or negatively-skewed lotteries (with identical expected returns): positively-skewed lotteries offered a **low probability** of a **larger gain** and a **high probability** of a **smaller gain**, while negatively-skewed lotteries offered a **high probability** of a **smaller gain** and a **low probability** of a **loss**.

### Positively-Skewed Lottery

Invested: \$ $x$   
NOT Invested: \$(0.25 -  $x$ )

#### Probabilities & Payoffs:

- Win: \$ $6x$  with a  $1/6$  probability
- Lose: \$0 with a  $5/6$  probability

Expected Returns: \$0.25  
=  $(0.25 - x) + [6x \cdot (1/6)] + [0 \cdot (5/6)]$

### Negatively-Skewed Lottery

Invested: \$ $x$   
NOT Invested: \$(0.25 -  $x$ )

#### Probabilities & Payoffs:

- Win: \$1.2 $x$  with a  $5/6$  probability
- Lose: \$0 with a  $1/6$  probability

Expected Returns: \$0.25  
=  $(0.25 - x) + [1.2x \cdot (5/6)] + [0 \cdot (1/6)]$

- **Study 2:** Participants in the baseline condition were informed that there were four investment rounds (i.e., that Round 4 was the final one), while those in the treatment condition were **not informed** of this. All participants were presented with the positively-skewed lottery.

### Known Closure

**Instruction:** "The experiment consists of 4 successive rounds of investment decisions. You will have a total of \$1.00 to invest with as you see fit. ... At the end of the four rounds, ..."

Decision Interface: Round 1 (out of 4)

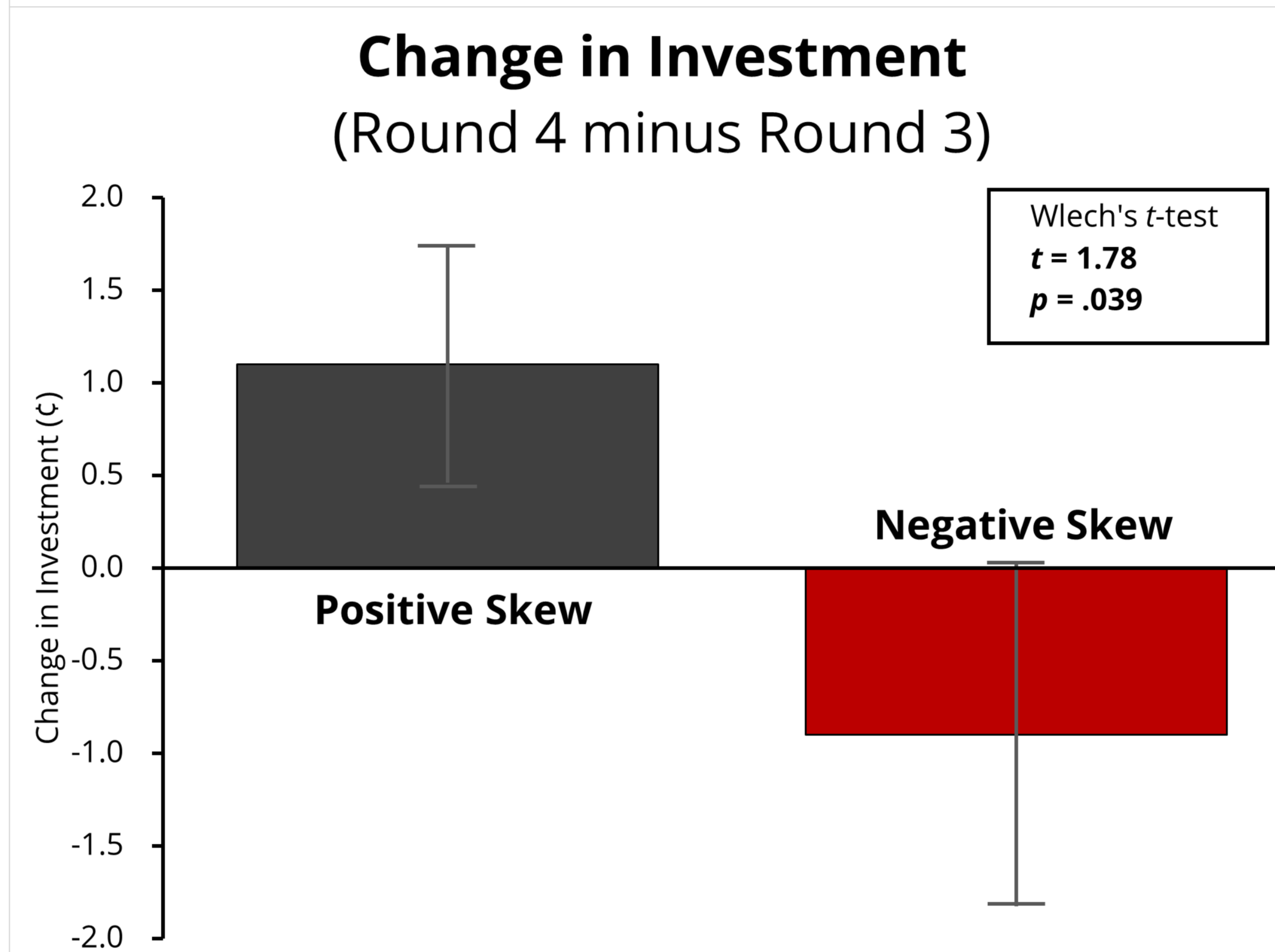
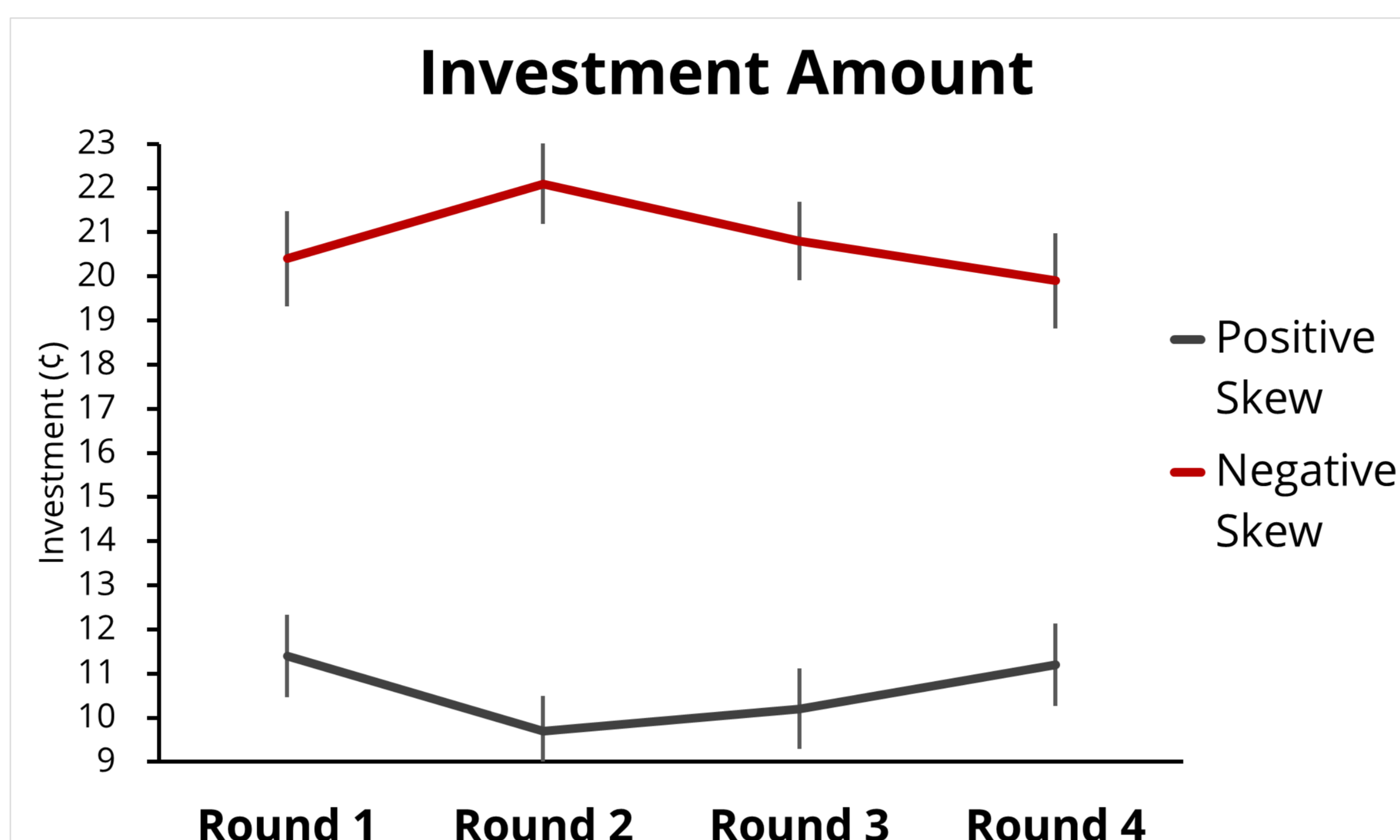
### Unknown Closure

**Instruction:** "The experiment consists of several successive rounds of investment decisions. You will have \$0.25 to invest with each round as you see fit. ... At the end of the rounds, ..."

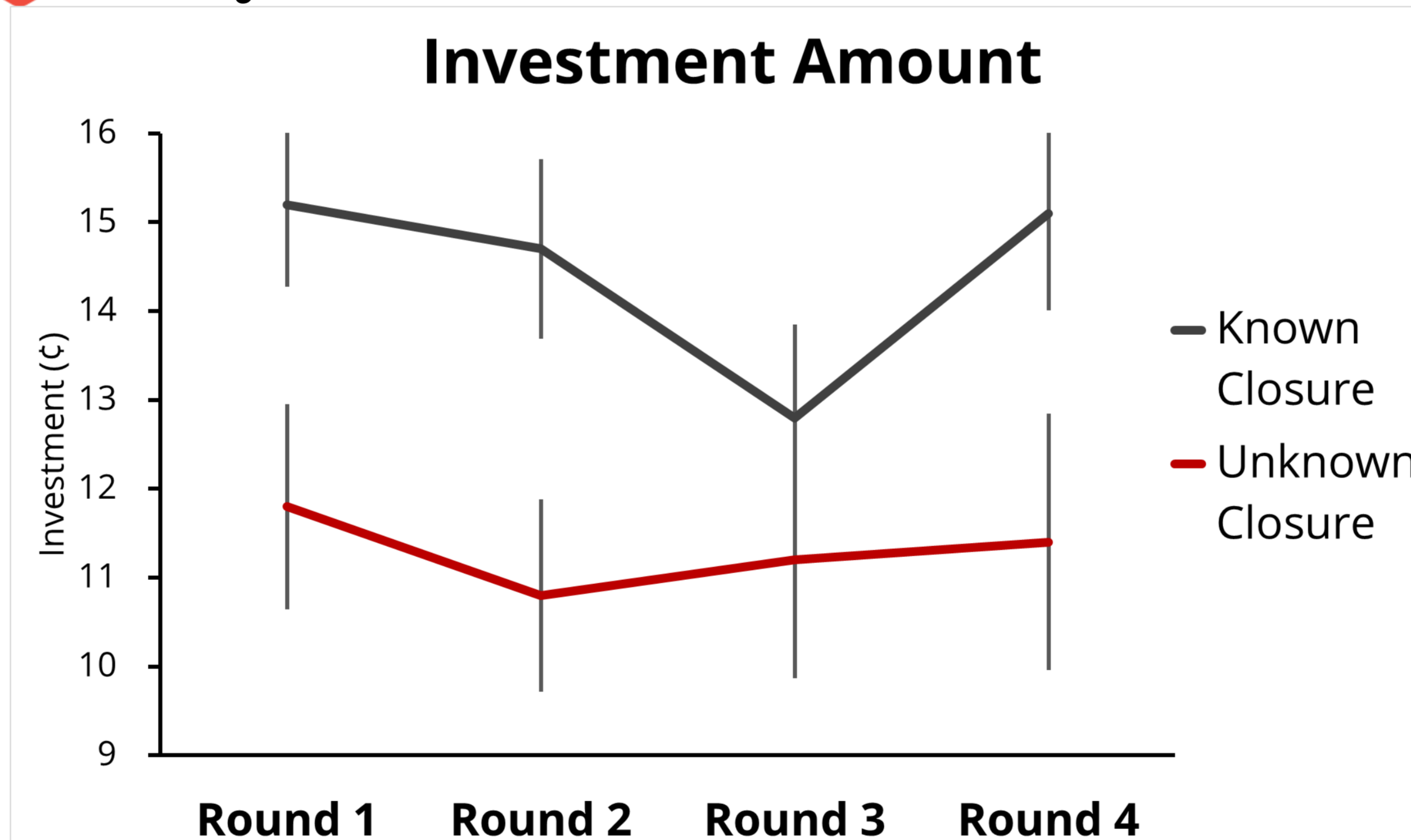
Decision Interface: Round 1

## Results

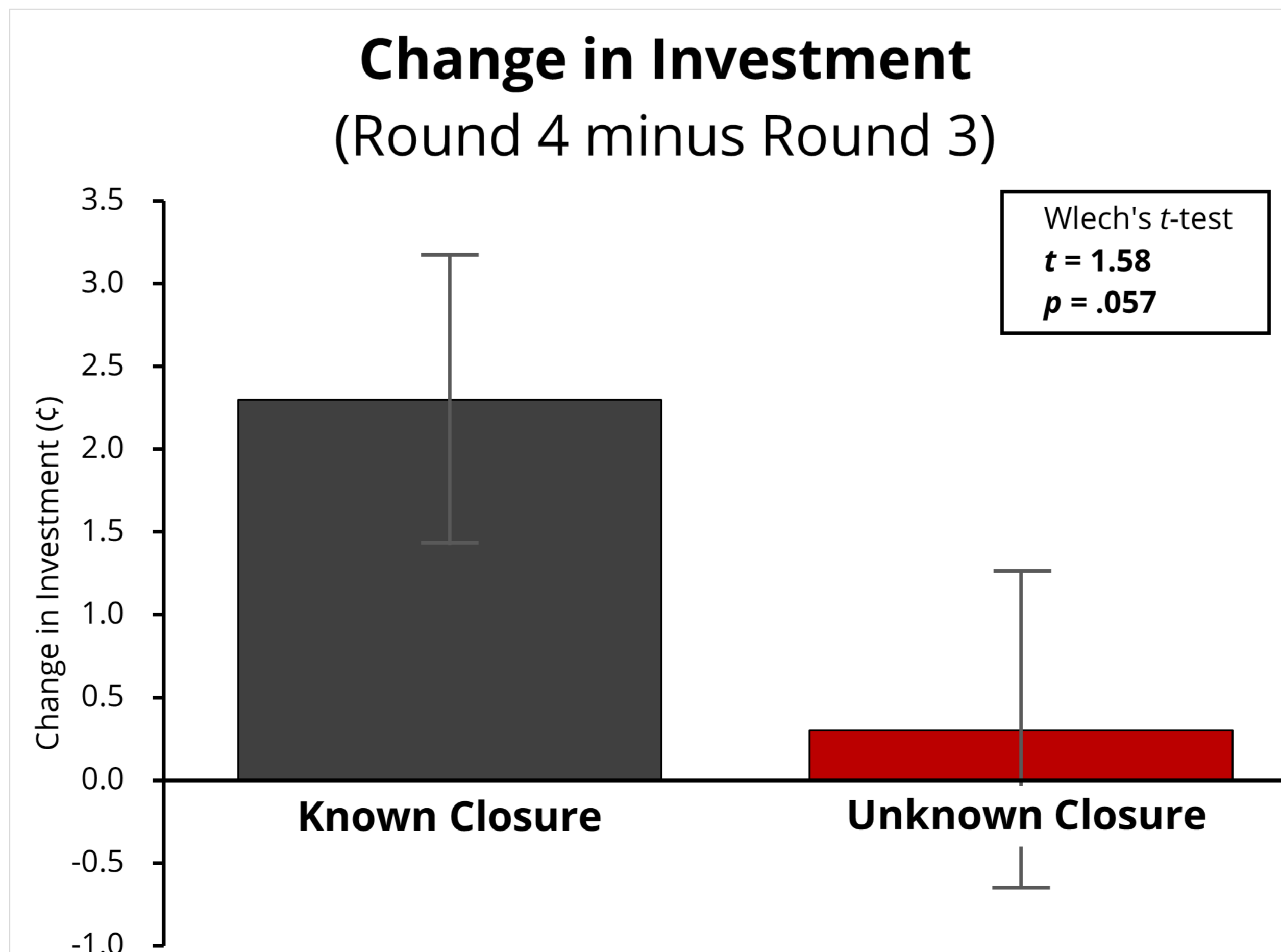
### Study 1: Positive vs. Negative Skew



### Study 2: Known vs. Unknown Closure



• Change in Investment ((Round 3 vs. 4)\*[Known vs. Unknown]):  
 $p = .024$



## Participants & Designs

- **Study 1:**  $N = 302$  (M-Turk, US-only), Between-Subjects Design with 2 Conditions (Positively- vs. Negatively-Skewed Lotteries)
- **Study 2:**  $N = 302$  (M-Turk, US-only), Between-Subjects Design with 2 Conditions (Known vs. Unknown Closure)
- The results are from participants who had accumulated losses by the end of Round 3 ( $N = 127$  in Study 1;  $N = 174$  in Study 2).

## Main Findings

(Participants with accumulated losses)

- Participants presented with positively-skewed lotteries increased risk-taking in the final round (replicating the loss-chasing effect for paper losses).
- By contrast, participants presented with negatively-skewed lotteries did **not** increase risk-taking, as these lotteries did **not** allow them to recover their losses.
- The increased risk-taking after a loss was observed only from participants who were aware of the closure of the investment session.
- Participants unaware of the closure, however, did **not** take on more risk in the final round because they did **not** know that it was the last chance to recover their losses.

## Discussion

- We demonstrate that the motivation to recuperate losses drove subsequent risk-taking in our studies. Specifically, participants took on more risk only if the risky prospects they could invest in allowed them to at the least break even (Study 1). Also, people increased risk-taking only if they knew it was the last chance to recover their losses (Study 2).
- These results showed that the dynamics of risk-taking hinge on whether a person can return to her **reference point** and how a **mental bracket** is defined, echoing **CPT** and **mental accounting**.

## References

- [1] Imas, A. (2016). The realization effect: Risk-taking after realized versus paper losses. *American Economic Review*, 106(8), 2086-2109.
- [2] Langer, T., & Weber, M. (2008). Does commitment or feedback influence myopic loss aversion? An experimental analysis. *Journal of Economic Behavior & Organization*, 67(3-4), 810-819.
- [3] Shiv, B., Loewenstein, G., Bechara, A., Damasio, H., & Damasio, A. R. (2005). Investment behavior and the negative side of emotion. *Psychological Science*, 16(6), 435-439.

**Acknowledgments:** The first author gratefully acknowledge support from the Graduate Student Assembly / Provost Conference Funds, Carnegie Mellon University.