

## Background

- Trying to answer a question and making errors has been shown to increase learning of the correct answer more than merely studying the correct answer (errorless study).
- However, the benefits of effortful study has primarily been researched with semantically rich information.
  - E.g., Trivia: What is the capitol of Australia? or
  - E.g., Related word pairs: swim-float
- **Does errorful studying benefit learning of episodic information more than errorless study?**
  - Grocery prices
- **We hypothesize the benefit of errorful over errorless study will increase with semantic support.**
  - Semantic support: reasonable grocery prices versus unreasonable grocery prices<sup>1</sup>

### Experimental Design:

2 (study condition: errorless vs. errorful; within-subjects) x 2 (price type: reasonable vs. unreasonable; between subjects)

## Study Design

Complete for items 1-8 & repeat with items 9-16

Study Phase

2 min. Distractor

Test Phase

½ Guess with feedback  
½ Errorless

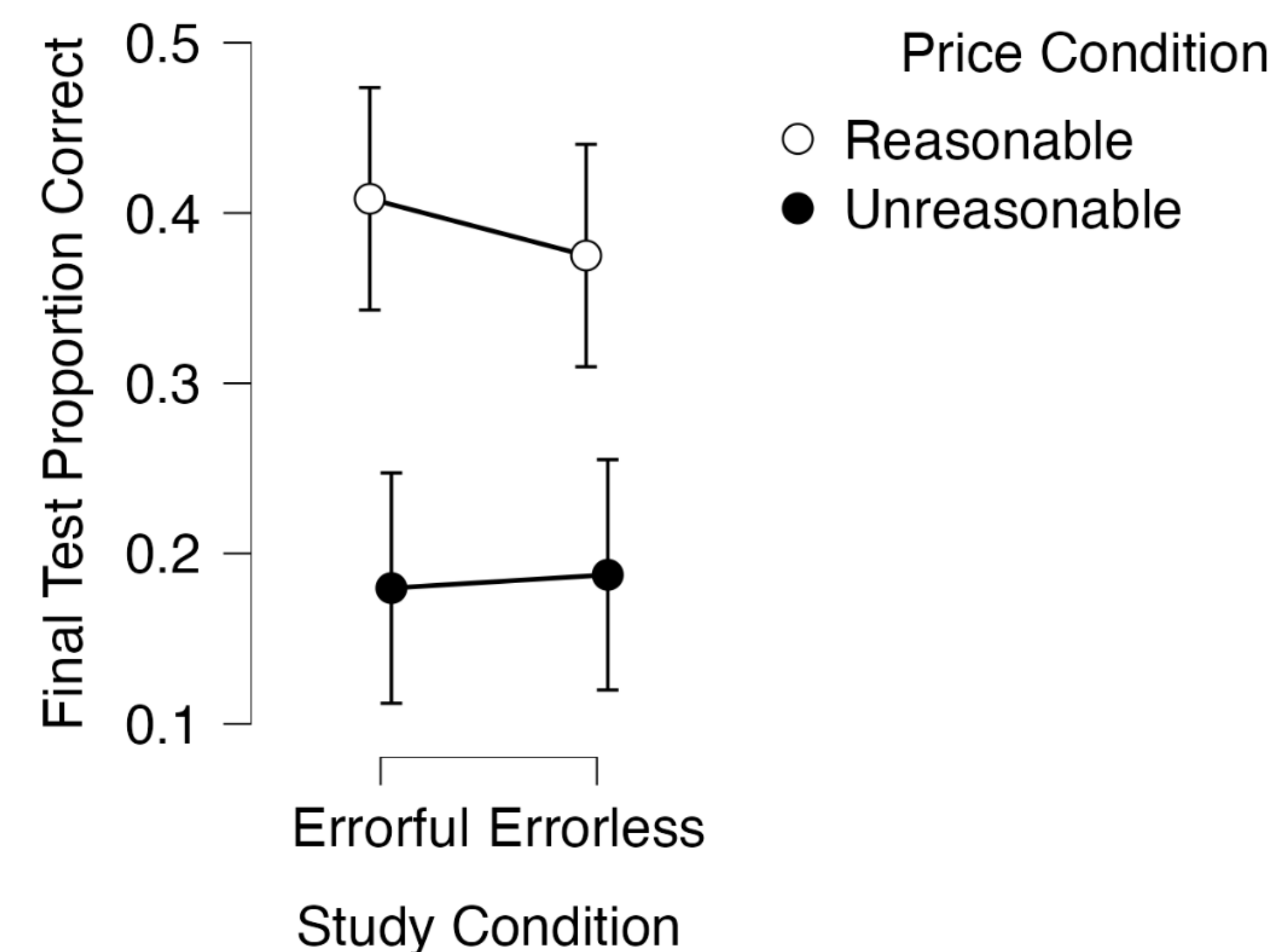
Recall all

## Study & Test Phases

- Participants studied the prices of 2 lists of 8 grocery items.
  - ½ **errorless**: study correct price for 10 seconds
  - ½ **errorful**: guess the price at your own pace, and then study the correct price for 10 seconds
- Distractor task and then test on 8 grocery items
- Repeat with 8 new items and prices

We hypothesized that participants will better learn the grocery prices if they first guess the prices, as opposed to studying the prices with no opportunity to make mistakes.

## Results (N = 31)



- Higher memory test scores for reasonably priced grocery items compared to unreasonably priced items.
- Memory for prices did not depend on whether they were learned through errorful or errorless conditions.

## Materials & Procedure

**Errorless**  
Reasonable price example



Price: \$ 3.59

This is the correct price we want you to learn.  
The computer will automatically advance after 10 seconds.

Study

**Guess w/ Feedback**  
Unreasonable price example



Price: \$

Type in your guess and then press the ENTER/RETURN key to continue.

Feedback

Learn Price



Price: \$ 7.49

This is the correct price we want you to learn.  
The computer will automatically advance after 10 seconds.

Test

Recall Price



Price: \$

Please type the correct price of this item that you studied earlier in the experiment and then press the Enter/Return button on your keyboard to continue.

## Conclusion

- Learning by restudying versus guessing has little to no effect on one's memory of such knowledge when the test required primarily episodic memory.
- Adding semantic supports (i.e., reasonable grocery prices) improved memory, on average.
- But semantic supports did not increase the benefits of errorful learning.

## Implications

- Consistent with prior research, material that has more meaning is more memorable.
- Students' learning may improve if information is reasonable, meaningful, makes sense, and/or fits with their expectations and understanding of the world.
- Unlike prior research with primarily semantic information (word pairs), errorful learning conditions did not improve memory for the more episodic materials.
- Whether information is reasonable or unreasonable overrides the technique used to memorize the information.
- The findings of this experiment have implications for instructors when creating lesson plans, as well as for students when studying course material.
- It may be beneficial for instructors to create real-world examples that students can use to prepare for subsequent testing, as well as for students to think of material they have learned in terms of their own life experiences.

## References

<sup>1</sup>Whatley, M.C., Castel, A.D. (2022). The role of metacognition and schematic support in younger and older adults' episodic memory. *Memory & Cognition*, 50(3), 601–616.  
<https://doi.org/10.3758/s13421-021-01169-y>