

# How Helpful is a Hint?: The Role of Hints in Children's Retrieval Based Learning

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## Introduction

- \* Research examining different learning methods demonstrates that testing (i.e., retrieving answers from memory) leads to better learning compared to restudying (i.e., re-reading material) (Roediger & Karpicke, 2006).
- \* Previous research has focused on the testing effect in adults (Karpicke & Roediger, 2007; Roediger & Karpicke, 2006), with fewer studies examining the testing effect in children (Fazio & Marsh, 2019).
- \* Although children also typically demonstrate the testing effect (Rohrer et al., 2010), results are inconsistent regarding testing benefits throughout childhood (Lipowski et al., 2014).
- \* Furthermore, children may need more scaffolding to engage in beneficial retrieval process associated with testing (Karpicke et al., 2014).

### Current Study

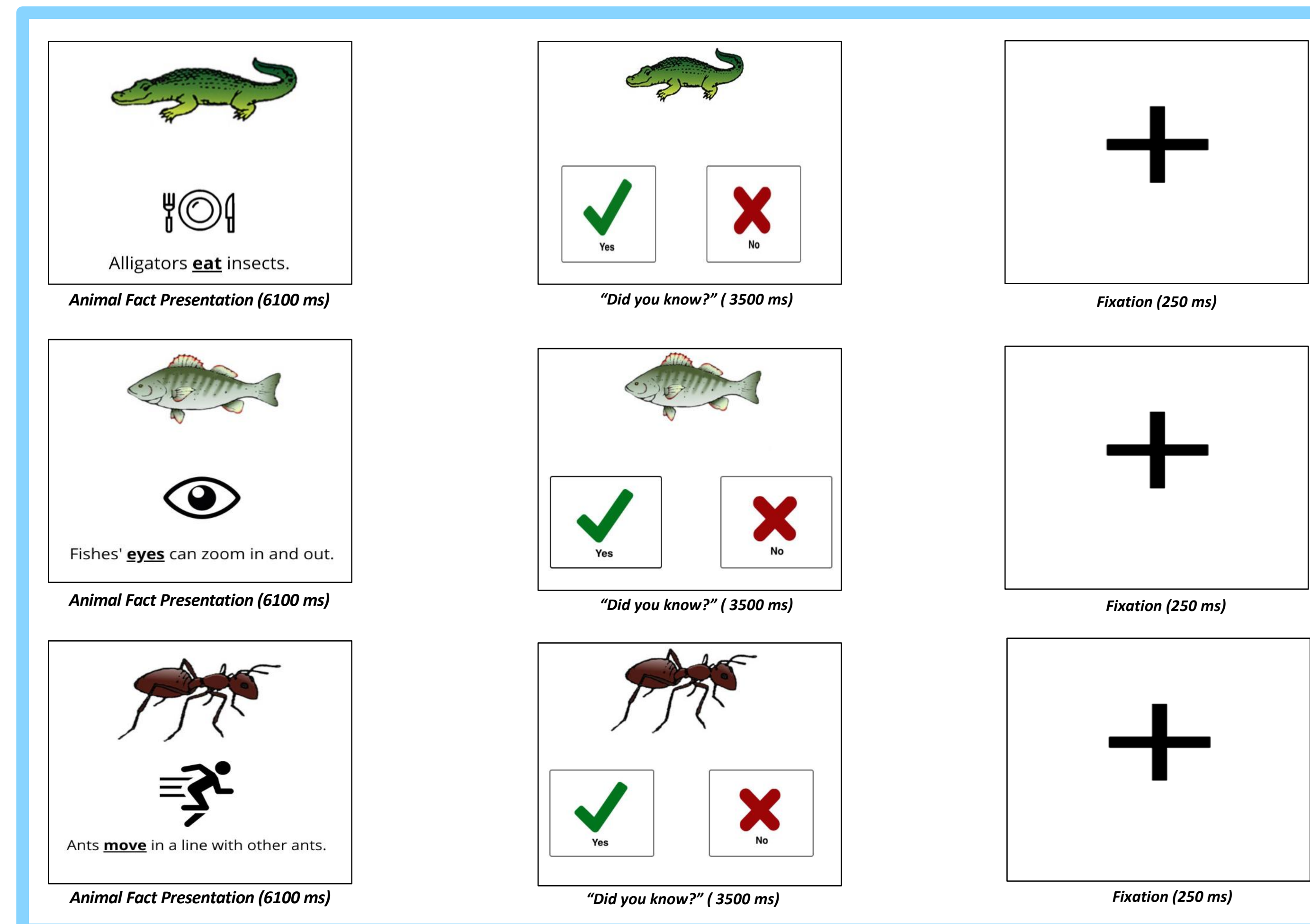
- \* The current study experimentally examined whether scaffolding retrieval through hints lead to better long-term learning compared to test and restudy conditions in children 8- to 13-years-old.
- \* We predicted that children would better remember information in test and hint conditions relative to restudy conditions.
- \* We also predicted that the difference between hint and test conditions would be larger in younger children, since older children may already spontaneously engage in the necessary retrieval processes needed to benefit from testing even in the absence of hints.

## Method

- \* Participants:  $N=58$  (Target  $N=76$ ); 8- to 13-year-olds (Mean Age = 10.2,  $SD=2.09$ ); (OSF link: [osf.io/rx32s](https://osf.io/rx32s))
- \* Children completed an online memory task where they were presented with short facts about animals. Tasks took place in two virtual sessions about 24 hours apart.
- \* **Session 1:**
  - \* Encoding: Participants encoded 36 facts about animals across 3 categories: eyes, moves, eats.
  - \* Practice Test
    - \* Hint Condition (12 Trials): Children were presented with the fact category (e.g., you learned about how this animal moves).
    - \* Test Condition (12 Trials): Children had to answer what they learned without any help.
    - \* Restudy Condition (12 Trials): Children were presented the full fact again.
- \* **Session 2:**
  - \* Participants took a final test in the absence of hints.

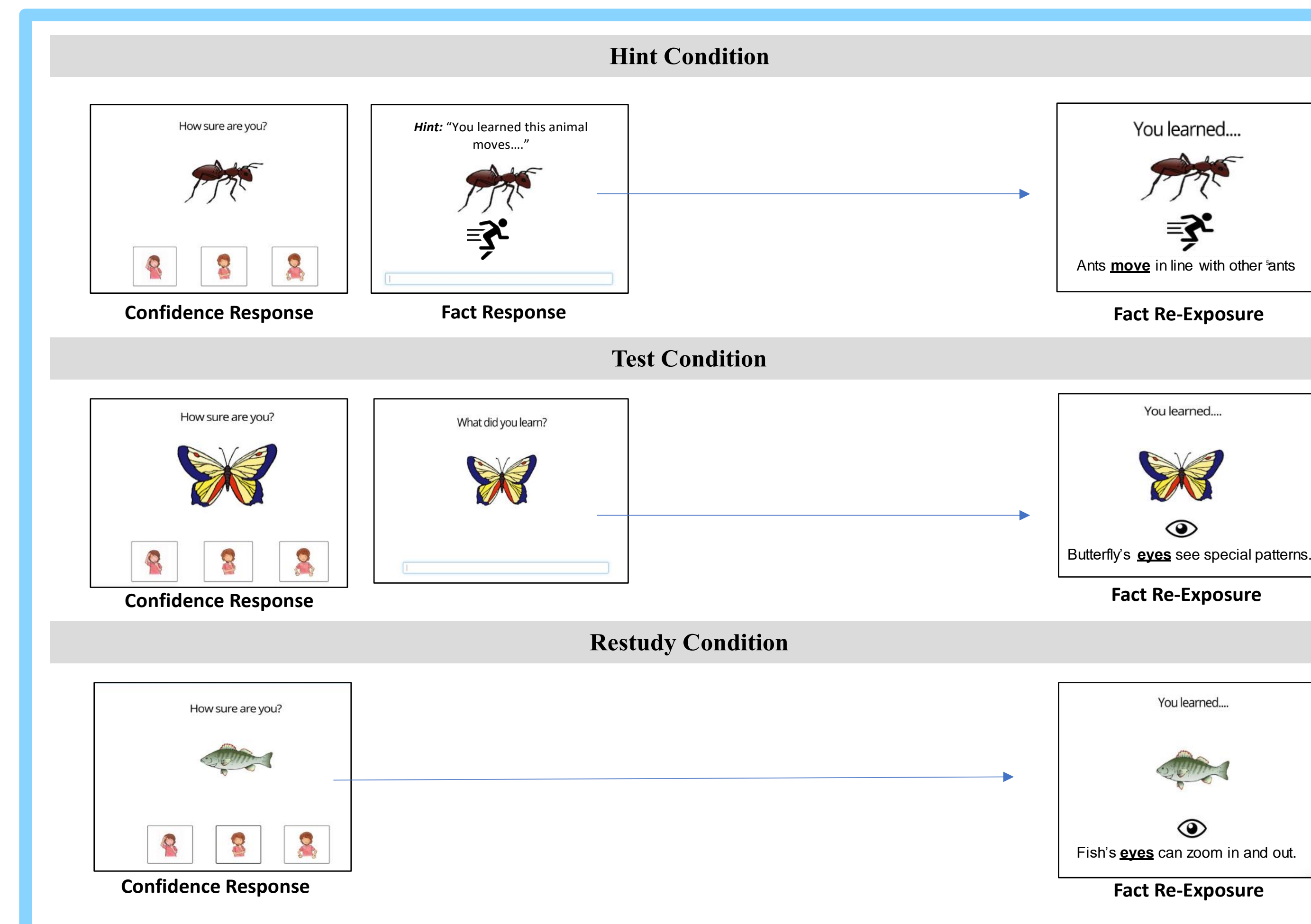
## Experimental Design

### Encoding Phase



- \* Participants were randomly presented with 36 animal facts about either an animal's eyes, how an animal moves, or what an animal eats.
- \* After the participants saw the fact, they were asked to report if they knew this fact before the game today.

### Practice Test Phase

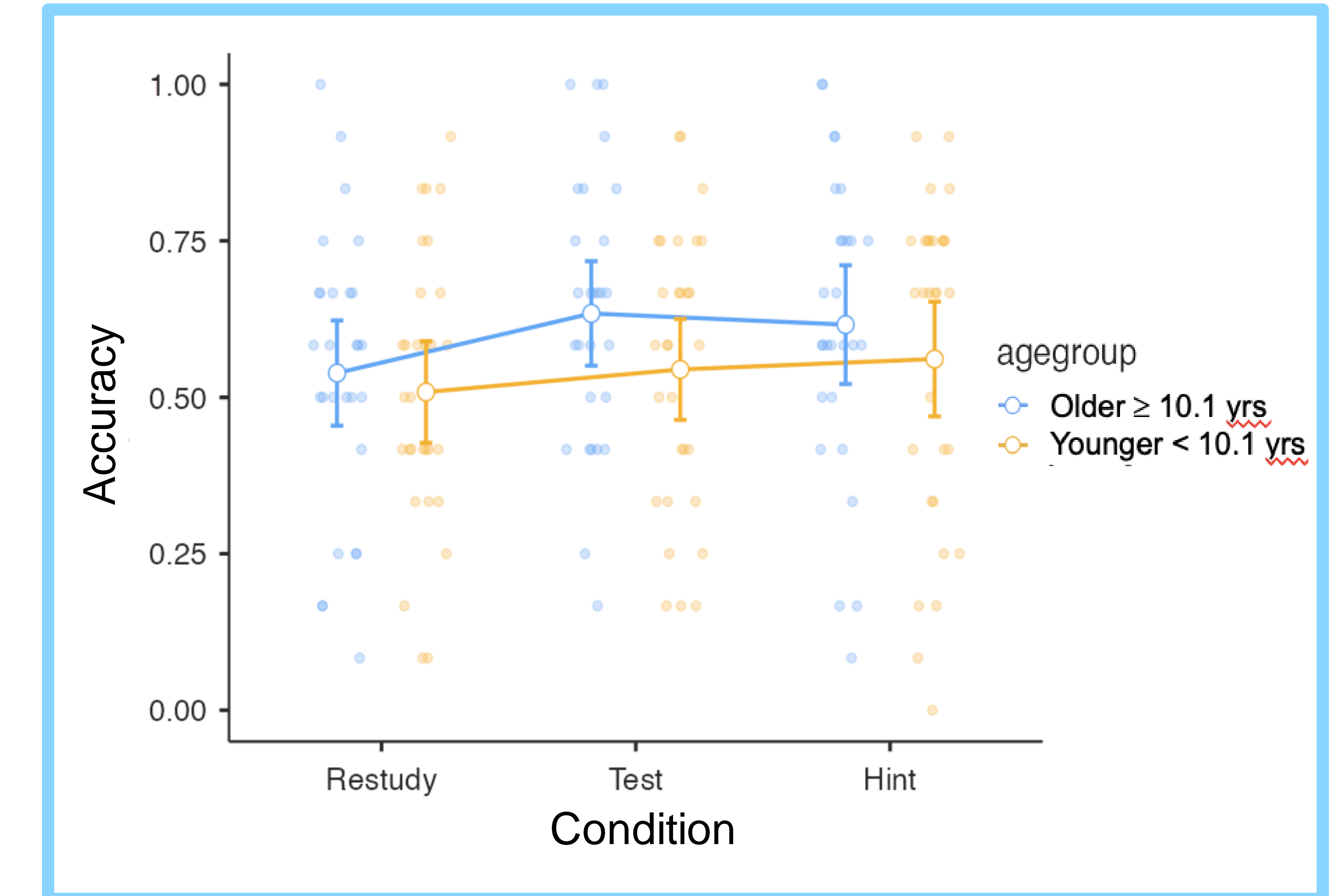


- \* Participants were first asked to give their confidence ratings.
- \* Participants then completed randomly intermixed trials of Hint, Test, and Restudy conditions.
- \* Participants were exposed to the full fact during the restudy condition and after providing a response in the hint and test conditions.

### Final Test Phase

- \* Occurred ~ 24 hours later.
- \* Participants were first asked to give their confidence ratings.
- \* Participants were then tested on the animal facts in the absence of hints.

## Results



- \* A main effect of condition was observed,  $F(2, 112) = 5.51$ ,  $p = .005$ ,  $\eta^2 = .02$ .
- \* Final accuracy during the hint condition ( $M = .59$ ,  $SD = .25$ ) was significantly higher compared to the restudy condition ( $M = .52$ ,  $SD = .22$ ),  $t(56) = -2.77$ ,  $p = .007$ ,  $d = .36$ .
- \* Final accuracy was also significantly higher in the test condition ( $M = .59$ ,  $SD = .22$ ) compared to the restudy condition ( $M = .52$ ,  $SD = .22$ ),  $t(56) = -2.80$ ,  $p = .007$ ,  $d = .36$ .
- \* No difference between the hint and test condition was observed.
- \* No significant effect of age nor an interaction between age and condition were observed.

## Discussion

- \* The current initial findings demonstrate that testing and scaffolded testing (i.e., hints) lead to significantly better performance than restudying.
- \* No difference between hint and test conditions were observed, suggesting that by middle childhood, scaffolded retrieval does not provide benefits above and beyond those of independent retrieval.
- \* Results should be interpreted with caution given that the full sample has yet to be collected.

## References

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- \* Roediger, H. L. & Karpicke, J. D. (2006). Test-enhanced learning. *Psychological Science*, 17(3), 249-255. <https://doi.org/10.1111/j.1467-9280.2006.01683.x>.
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