Could the Benefits of Trying, but Failing, to Predict a To-Be-Learned Response be an Artifact of the Experimental Materials?

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1 Background: Unsuccessful Retrieval

Kornell, Hays, and Bjork (2009) examined the effects of failing to predict target responses before study.

13 seconds

Read | Whale : Mammal | X 30

8 seconds | *5 seconds*

Test | Golf : _____ | Golf : Sport | X 30

Final Test | Whale : _____ | X 60

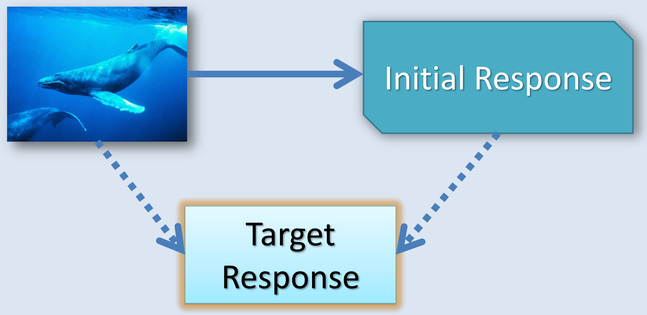
Items initially unsuccessfully predicted showed higher recall performance than items which were only read during the study phase.

Participants studied low-associate word pairs which led them to predict incorrectly on 95% of trials (i.e., 1.5 correct predictions out of 30, on average)

2 Question: Are the benefits of attempting to predict to-be-learned a response due to the use of heuristics at the final test?

A nearly complete failure to predict the response could have benefitted participants in 2 ways:

- The "these answers are weird" strategy (i.e., obvious associates like *"whale : ocean"* are never correct).
- The "my initial guess is always wrong" strategy.



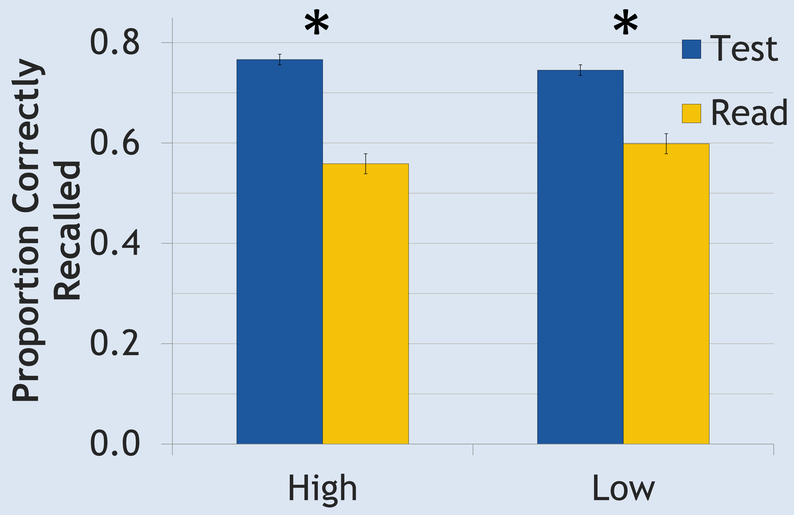
3 Experiment 1: Mixed Item Strength

Does mixing high and low cue-target associates disrupt the benefits of making incorrect predictions?

Same procedure as Kornell, Hays, and Bjork (2009) with modified materials (N = 50).

e.g.

Condition	*Forward association strength*	*Example:*
High	.30-.40	Table : Chair
Low	.03-.05	Whale : Mammal



Experiment 2: Correctly Guessing the Answer

Does making your initial response sometimes correct remove the benefits of incorrectly predicting a to-be-learned response?

Rig the experiment so half of the predictions are correct (N = 55).

13 seconds

Whale : Mammal | X 20 | **Read**

8 seconds | *5 seconds*

Golf : Shoes | Golf : Sport | X 20 | **Test-Wrong**

8 seconds | *5 seconds*

Golf : Shoes | Golf : Shoes | X 20 | **Test-Right**

4 Experiment 2: Results

5 Answer

No.

6 Discussion

The benefit of making incorrect predictions is not an experimental artifact. Current theories include:

- Semantic activation hypothesis[1,2,3]
- Mediator hypothesis[4]

7 References

[1]Grimaldi, P. J., & Karpicke, J. D. (2012). When and why do retrieval attempts enhance subsequent encoding? *Memory & Cognition, 40*, 505-513

[2]Hays, M. J., Kornell, N., & Bjork, R. A. (in press). When and why a failed test potentiates the effectiveness of subsequent study. *JEP:LMC*

[3]Kornell, N., Hays, M. J., & Bjork, R. A. (2009). Unsuccessful Retrieval Attempts Enhance Subsequent Learning. *JEP: LMC, 35(4)*, 989-998.

[4]Pyc, M. A., & Rawson, K. A. (2010). Why testing improves memory: Mediator effectiveness hypothesis. *Science,* 333, 335.

Acknowledgements

This research was supported by a grant from the James S. McDonnell Foundation.

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