The Testing Effect: Background Knowledge as a Possible Moderator

Jessica A. Macaluso [1,2] & Scott H. Fraundorf [1]

[1]University of Pittsburgh, Learning Research and Development Center, [2] University of Pittsburgh & Carnegie Mellon University, Center for the Neural Basis of Cognition

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BACKGROUND

The Testing Effect[1]:

- **Restudying:** studying the material one time and then studying the same material again (e.g., rereading the same passage)
- **Retrieval practice:** studying the material one time and then being asked to recollect the information (e.g., taking a quiz)

Impact of Background Knowledge[2]:

- **Approach to materials:** choosing which study strategies to use
- **Level of expertise:** novice versus expert

Role of Feedback[3,4]:

- Prevent the illusion of knowing
- Improve self-regulated learning

Educational Relevance[5]:

- Most people have never been taught how to effectively study!

PROJECT GOALS

- Understand **how to best use** the testing effect
  - (i.e., under what conditions)
- Learn about **who could benefit the most** from the testing effect
  - (i.e., what works best for whom)

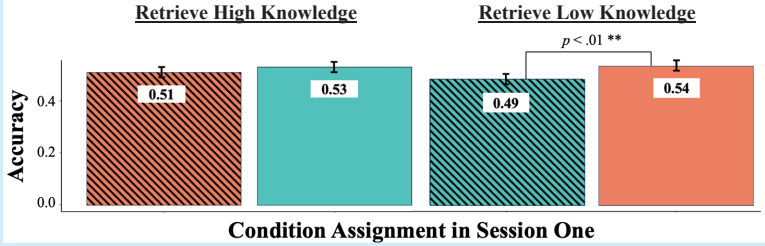
RESULTS

Study Strategy
- Restudying
- Retrieval Practice

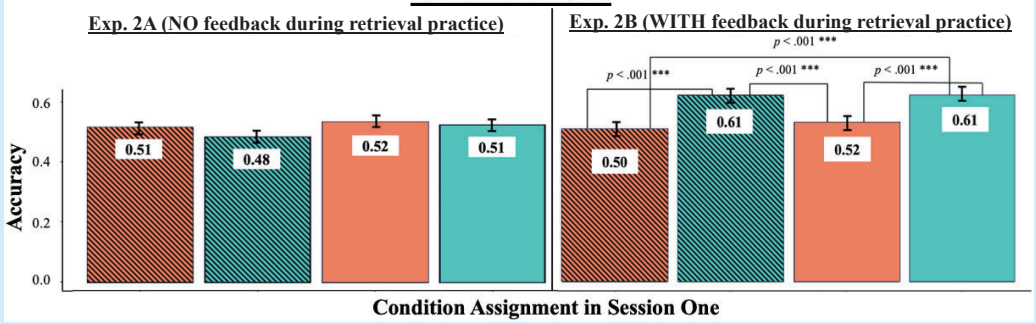
Background Topic Material
- No
- Yes

EXPERIMENT 1

Mean Accuracy on Session Two Test for



EXPERIMENT 2



Experiment 1 Take Aways:

- Learners who received the background text outperformed those who did not.
  - Background is relevant to learning.
- Even when learners did not receive background material, they performed above chance.
  - Background material is not necessary to understand the texts.
- A traditional testing effect was not found.
  - As a result, we tried a stronger version of the retrieval-practice paradigm (i.e., by including feedback) in Experiment 2.

Experiment 2 Take Aways:

- Learners performed significantly better on the session two test if they studied via retrieval practice and got feedback, compared to restudying.
- Performance was overall higher in Exp. 2B (yes feedback) in the retrieval practice. condition versus Exp. 2A (no feedback).
- Participants' learning of the main text was significantly better if background materials were provided.
- No interaction between the testing effect and background topic knowledge.

PROCEDURE (Exp. 1 *N* = 172, Exp 2. *N* = 236)

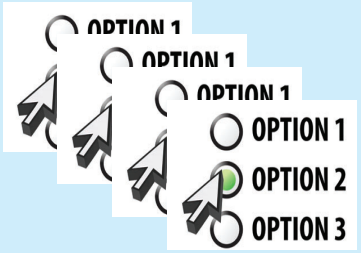
Session One

Background Text (Y/N) → Main Text → Retrieval or Restudy

~ 400 words ~ 200 words 12 multiple-choice ?s or 12 sentence facts

Retrieval Expert Topic	List 1	Background: Topic 1	Main Text: Topic 1	Retrieval: Topic 1
Restudy Novice Topic	List 2	✖	Main Text: Topic 1	Restudy: Topic 1
Restudy Expert Topic	List 3	Background: Topic 1	Main Text: Topic 1	Restudy: Topic 1
Retrieval Novice Topic	List 4	✖	Main Text: Topic 1	Retrieval: Topic 1

Session Two (one week later)



Final Test

12 multiple-choice ?s/topic, 48 ?s total

- For Experiment 2 ONLY, ½ of participants received immediate feedback during session one retrieval (Exp. 2B), and ½ did not (Exp. 2A)

EXAMPLES OF MATERIALS (Session One)

Retrieval Quiz Question

Which of the following statements would the author most likely agree with regarding dinosaur extinction?

a. They lasted far longer than most animals before going extinct.

b. Their extinction proves their bad design.

c. They were too big to survive in the ice age that came after the asteroid hit.

Restudying Sentence Fact

"The authors would most likely agree that **dinosaurs lasted far longer than most animals before going extinct**."

CONCLUSION & FUTURE DIRECTIONS

- Background topic material helps learners' memory retention, regardless of study strategy.
- Feedback during retrieval practice proves to be effective for memory retention.
- These effects are independent of each other: background topic material was beneficial with either study strategy and the testing effect was beneficial with or without background topic material.
- Data collection is ongoing for a study looking at pre-existing expertise (NOT experimentally manipulated) in an individual and explore its impact on the testing effect.

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REFERENCES: [1] Roediger & Karpicke (2006) [2] Chi, Feltovich, & Glaser (1981) [3] Glenberg, Wilkinson, & Epstein (1983) [4a] Barenberg & Dutke (2019) & [4b] Soderstrom & Bjork (2015) [5] Schraw & Moshman (1995)