Does Pretesting Enhance Learning When it is Done Covertly?

Ashley J. Berdelis, Michelle L. Rivers, & Sarah K. Tauber
Department of Psychology, Texas Christian University

Background

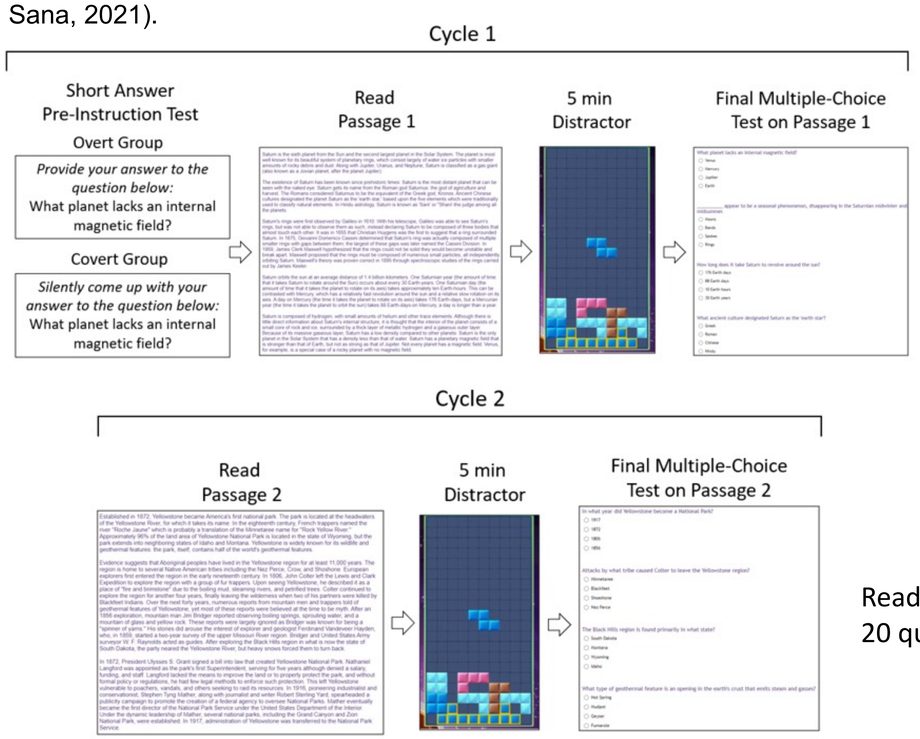
- Research shows practice testing after material is studied leads to better memory than other strategies like restudying (Dunlosky et al., 2013).
- Practice tending tends to be more effective when students recall material verbally or write it down (**overt learning**) compared to only mentally recalling the material (**covert learning**) (Tauber et al., 2018).
- Studies show that answering pretest questions before studying, even if people provide wrong answers, leads to beneficial learning outcomes compared to just studying material (Pan & Carpenter, 2023).

Research Question

- **Does pretesting (answering pre-instruction questions) enhance learning when it is done covertly?**

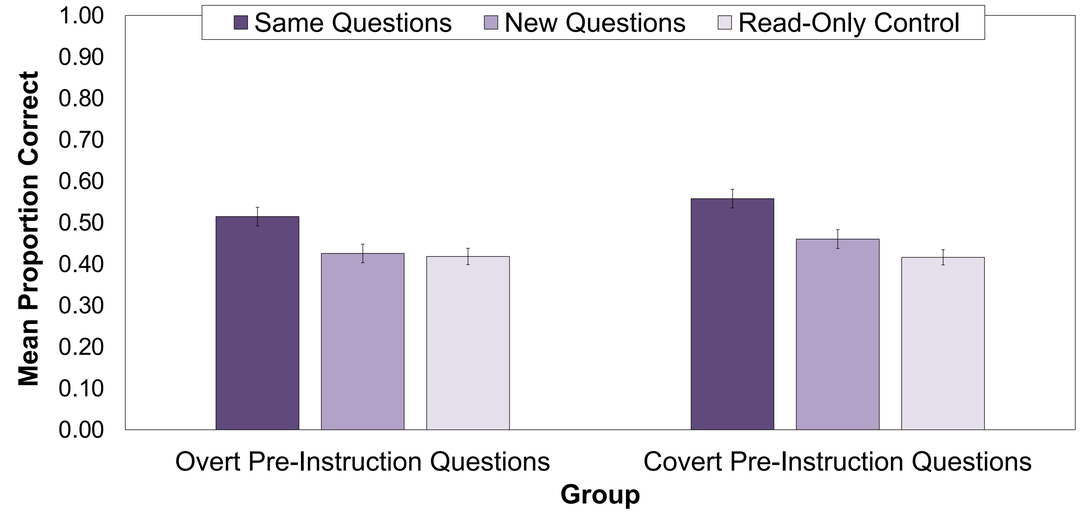
Method

- 165 undergraduates from Texas Christian University (*M* age = 19.7 years, 73% women, 64% white).
- A **2 (pre-instruction modality: overt vs covert pre-instruction questions) x 3 (question type: same, new, read-only control) mixed-factor design** was used in which question type was manipulated within participant and pre-instruction modality was manipulated between participants.
- Materials used were expository texts that were approximately 1,100 words long on Yellowstone National Park and the planet Saturn, as well as 20 test questions per passage (taken from Pan & Sana, 2021).



Passage order (Yellowstone or Saturn) and learning activity order (pretest or read-only control) were counterbalanced across participants. For simplicity, only one of two counterbalanced orders is shown above.

Performance on Final Multiple Choice



	Time Spent Pretesting	Pretest Performance
Overt Pretest Group	12.78 seconds	.04
Covert Pretest Group	8.21 seconds	--

*Error bars represent standard error

Conclusions and Future Directions

- **Answering covert and overt pre-instruction questions is an effective way to learn.**
- Both overt and covert pre-testing are more beneficial than just reading. Covert pre-testing may be a more efficient strategy.
- In a questionnaire after the study, 70% of participants rated pre-instruction testing as more effective than reading.
- Future research should use short answer questions (instead of multiple-choice questions) for the final test to see if the same effects are found.
- Instructors should consider pre-testing their students prior to introducing new topics in class.

References

- Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public interest*, *14*(1), 4-58.
- Pan, S. C., & Carpenter, S. K. (2023). Prequestioning and pretesting effects: a review of empirical research, theoretical perspectives, and implications for educational practice. *Educational Psychology Review*, *35*(4), 97.
- Pan, S. C., & Sana, F. (2021). Pretesting versus posttesting: Comparing the pedagogical benefits of errorful generation and retrieval practice. *Journal of Experimental Psychology: Applied, 27*(2), 237–257.
- Tauber, S. K., Witherby, A. E., Dunlosky, J., Rawson, K. A., Putnam, A. L., & Roediger III, H. L. (2018). Does covert retrieval benefit learning of key-term definitions?. *Journal of Applied Research in Memory and Cognition*, *7*(1), 106-115.

reSEaRCh
Science and Engineering Research Center

Poster presented at the 2024 TCU Student Research Symposium
Funded by a research grant from the Science and Engineering Research Center (funds used for piloting materials with an online sample)