1 Introduction

Juxtaposed to the well established finding that recalling learned material, compared to merely restudying it, facilitates its long-term retention (Adesope, Trevisan, & Sundararajan, 2017; Glover, 1989; Roediger III & Butler, 2011; Roediger III & Karpicke, 2006a, 2006b; Rowland, 2014) stand the results of a number of studies showing that retrieving previously studied information can even facilitate the acquisition of new information (Chan, Meissner, & Davis, 2018). This has stimulated the use of various qualifiers such as *interim* (Wissman, Rawson, & Pyc, 2011), *interpolated* (Szpunar, Khan, & Schacter, 2013), and *forward* (Pastötter & Bäuml, 2014; Yang, Potts, & Shanks, 2018), in order to distinguish the latter testing effect from the former, now sometimes referred to as the *backward* testing effect (e.g Yang et al., 2018).

A typical demonstration of the backward testing effect entails an initial learning phase, followed by a period during which participants either restudy the same material, engage in a memory test involving the studied material, or are not exposed to the original material at all. Finally, after a retention interval, an additional administration of a memory test reveals that the group subjected to a memory test during the intervening period has a distinct advantage over the other two groups. A pioneering study by Darley and Murdock (1971) introduced a difference prompted a surge of interest in the somewhat dif effect mentioned above. wherein the recall of previously studied material seemingly potentiates the acquisition of information that is yet to be learned. Throughout this paper, we will use the term *forward testing effect* to refer to the phenomenon under investigation.

1.1 Notes

one has attempted to commit to memory beforehand

A recent meta-analysis termed

The expectation of a final test ensured the continued processing of materials across the study sequence.

2 Methods

These are the methods.

References

Adesope, O. O., Trevisan, D. A., & Sundararajan, N. (2017, June). Rethinking the Use of Tests: A Meta-Analysis of Practice Testing. *Review of Educational Research*, *87*(3), 659-701.

Chan, J. C. K., Meissner, C. A., & Davis, S. D. (2018, November). Retrieval potentiates new learning: A theoretical and meta-analytic review. *Psychological Bulletin*, *144*(11), 1111-1146.

Darley, C. F., & Murdock, B. B. (1971). Effects of prior free recall testing on final recall and recognition. *Journal of Experimental Psychology*, *91*(1), 66-73.

Glover, J. A. (1989). The "Testing" Phenomenon: Not Gone but Nearly Forgotten. *Journal of Educational Psychology*, *81*(3), 392-399.

Pastötter, B., & Bäuml, K.-H. T. (2014, April). Retrieval practice enhances new learning: The forward effect of testing. *Frontiers in Psychology*, *5*.

Roediger III, H. L., & Butler, A. C. (2011, January). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences*, *15*(1), 20-27.

Roediger III, H. L., & Karpicke, J. D. (2006a). The Power of Testing Memory: Basic Research and Implications for Educational Practice. *Perspectives on Psychological Science*, *1*(3), 181-210.

Roediger III, H. L., & Karpicke, J. D. (2006b, March). Test-Enhanced Learning: Taking Memory Tests Improves Long-Term Retention. *Psychological Science*, *17*(3), 249-255.

Rowland, C. A. (2014). The effect of testing versus restudy on retention: A meta-analytic review of the testing effect. *Psychological Bulletin*, *140*(6), 1432-1463.

Szpunar, K. K., Khan, N. Y., & Schacter, D. L. (2013, April). Interpolated memory tests reduce mind wandering and improve learning of online lectures. *Proceedings of the National Academy of Sciences*, *110*(16), 6313-6317.

Wissman, K. T., Rawson, K. A., & Pyc, M. A. (2011, December). The interim test effect: Testing prior material can facilitate the learning of new material. *Psychonomic Bulletin & Review*, *18*(6), 1140-1147.

Yang, C., Potts, R., & Shanks, D. R. (2018, April). Enhancing learning and retrieval of new information: A review of the forward testing effect. *npj Science of Learning*, *3*(1), 8.