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Kevin W. Potter, Lucas D. Huszar, David E. Huber



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# Does inhibition cause forgetting after selective retrieval? A reanalysis and failure to replicate

Kevin W. Potter<sup>a,\*</sup>, Lucas D. Huszar<sup>a</sup>, David E. Huber<sup>a</sup>

<sup>a</sup>*University of Massachusetts Amherst, Amherst, 01003 MA, USA*

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## Abstract

Retrieval practice can produce forgetting, but it remains unclear using only behavioral data whether this forgetting is caused by targeted inhibition versus interference. Therefore, Wimber et al. (2015) used pattern classifier analyses of fMRI data to track individual memories in a novel variant of retrieval induced forgetting. After initial learning, people recalled target images across selective retrieval practice trials, and cortical activity patterns gradually became more similar to those evoked by the target pictures (i.e., pattern enhancement) and less similar to those evoked by competing pictures (i.e., pattern suppression). The key question was whether this inhibition of competing memories would cause forgetting. Wimber et al. found a significant forgetting effect ( $p < .01$ ) on a subsequent forced choice picture recognition test, with lower accuracy for competitors than for baseline items. Because fMRI data is correlative, a causal interpretation of the data would require, at a minimum, more forgetting following cortical pattern suppression (as occurred for competitors) than cortical pattern enhancement (as occurred for targets). The interaction necessary to reach this conclusion was significant ( $p = 0.041$ ). However, reanalyzing the original data revealed that the interaction depended on the decision to code missing responses as equivalent to choosing the wrong picture. Even if missing trials reflected memory failures, at worst they would produce 50/50 guessing, rather than an error every time. Treating these trials as missing, or setting them to chance performance, resulted in no reliable forgetting difference between competitors and targets. Because this might reflect inadequate statistical power, we undertook two replication attempts of the behavioral paradigm, failing both times to observe more forgetting for competitors than targets. In fact, we failed to find any forgetting at all. We conclude that the study of Wimber et al. does not support the conclusion that forgetting is caused by targeted inhibition.

**Keywords:** Memory; Retrieval induced forgetting; Replication

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\*Corresponding author

Email address: kevin.w.potter@gmail.com (Kevin W. Potter)

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