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Memories can resist interference during new learning, study finds

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While acquiring new memories can enrich the human experience, they also can interfere with old ones and make them more likely to be forgotten—especially when a new event is highly similar to a past experience.

Postdoctoral scientist Dr. Josh Koen and Dr. Michael Rugg, director of the Center for Vital Longevity, addressed in a recent study how some memories persist in the face of strong interference. Koen and Rugg tested whether "reactivating," or bringing to mind, old memories during the course of new learning increases or decreases the interfering effects of new learning. Their work was published in the April 13 edition of the *Journal of Neuroscience*.

The researchers found that reactivating generic contextual information about a previous experience, rather than details unique to a particular event, is important in resisting the interfering effects that accompany new learning.

While undergoing functional magnetic resonance imaging (fMRI), 19 study participants were shown some words twice in association with two different judgment tasks while other words were presented only once. Later memory tests required the participants to recall the distinct tasks that were associated with each of the study words, regardless of whether the words were presented once or twice.

Koen and Rugg found that older memories that were more strongly

reactivated during new learning were less likely to be forgotten. In contrast to what has been previously thought, this suggests that reactivation of old memories during new learning mitigates the effects of interference and leaves those old memories intact.

One prevailing hypothesis has been that if a new experience reactivates an older memory, it returns that memory to a malleable state, which makes it susceptible to change or outright forgetting.

The researchers tested this hypothesis to see whether reactivating old memories can increase their susceptibility to interference through analyzing patterns of brain activity in the 19 adults who were scanned.

The findings that emerged shed light on how some memories are able to resist the potentially negative consequence of new learning, said Koen, first author on the paper.

"The results from our study suggest that when aspects of an older memory are reactivated during new learning, perhaps even when we are not consciously aware that the memory was reactivated, it is less likely to suffer interference and be forgotten," he said.

More information: Memory Reactivation Predicts Resistance to Retroactive Interference: Evidence from Multivariate Classification and Pattern Similarity Analyses. DOI: 10.1523/JNEUROSCI.4099-15.2016

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