



# A Framework of Episodic Updating: An Account of Memory Updating After Retrieval

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## Abstract

One of the functional roles posited for retrieval-induced memory malleability is that it allows memories to be updated with new information. A large body of literature from the cognitive and neurocognitive traditions has shown that retrieval can facilitate new learning. However, there is also recent evidence demonstrating that retrieval can impair new learning. Current models of episodic retrieval primarily focus on the processes and contextual updating as they relate to target retrieval. However, any account of episodic retrieval should also be able to accommodate the finding that retrieval can both facilitate and impair learning of new information presented after the retrieval attempt. A framework of episodic updating is presented that aims to synthesize these contrasting effects. In the framework, emphasis is given to the postretrieval processing phase of episodic retrieval. This phase has been characterized as involving interactive metamemory processes that monitor and control facets of the retrieval process with respect to the current goals for retrieval. This chapter ends with a discussion of the practical implications of updating after retrieval in educational practice.



## 1. INTRODUCTION

Memory is a complex and dynamic process. The formation and consolidation of memory extends over time and can be altered during this period (Müller & Pilzecker, 1900). The process of retrieving a memory can transform the very information being remembered (Bartlett, 1932; James, 1892). The century of research on memory processes following from these early insights has yielded extensive evidence from studies with both humans (e.g., Bjork, 1975; Loftus & Palmer, 1974) and animals (Lewis, 1979; Misanin, Miller, & Lewis, 1968; Nader, Schafe, & LeDoux, 2000; for a review see Alberini, 2011) that retrieval is a potent modifier of memory. Much research continues to be directed at understanding the dynamics of retrieval and the role of the component subprocesses of retrieval in supporting memory modification and updating (e.g., Dobbins & Davachi, 2006; Rugg & Vilberg, 2013; Karpicke, Lehman, & Aue, 2014; Koriat & Goldsmith, 1996; Tulving, 1983; Ben-Yakov, Dudai, & Mayford, 2015).

Current models of episodic retrieval focus primarily on the processes involved in updating as they relate to target retrieval. However, retrieval is also implicated in the updating of memory with new information. Here, the focus is on *why* retrieval facilitates updating with new learning in some cases but hinders it in others. This review begins with a discussion of memory updating research and highlights findings from the cognitive and neurocognitive traditions demonstrating a facilitatory effect of retrieval on

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