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From Learning to Retention: Reinforcement Learning and Episodic Memory Accounts of Association Learning

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Abstract

Understanding how short-term learning gives rise to durable memory remains a central question in cognitive science. Competing accounts emphasize either interactions between working memory and reinforcement learning, in which working memory interferes with long-term learning, or interactions between working memory and episodic memory, in which working memory supports encoding. The present study tested these accounts using an associative learning task in which set size and intertrial interval were manipulated during learning. While larger set sizes reduced memory performance, longer intertrial intervals selectively improved learning accuracy under high set-size demands and enhanced delayed retention, yielding advantages at both learning and test. These effects are consistent with a working memory–episodic memory framework in which additional temporal opportunity supports attentional maintenance and episodic encoding. The findings highlight the role of working memory as a processing system that facilitates long-term memory formation under appropriate temporal conditions.