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# Mixing memory and desire: How episodic memory aids goal-directed decisions

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## Abstract

Humans and animals have a remarkable ability to make decisions based on small numbers of experiences. They are also capable of generalizing from past experience to novel situations. These two capabilities are hallmarks of goal-directed behavior, and also strongly suggestive of an involvement of long-term, episodic memories.

In this chapter, I review the evidence that episodic memories play a role in flexible, goal-directed behavior. I also review neuroscientific evidence for the involvement in decisions of neural structures that are also known to support episodic memory, and distinguish these from evidence for those structures' involvement in decisions separate from episodic memory. I then describe existing theoretical accounts that describe multiple types of decision computations that incorporate episodic memory in different ways.

Synthesizing these lines of evidence, I then propose a unifying framework, incorporating what is known about the role of episodic memory among other types of memory, as well as normative considerations that take into account neuroscientific and psychological evidence about constraints on episodic memory encoding, retention, and retrieval. This framework, episodic sampling, entails sequential dependencies between samples and so may represent a fundamental limit on the predictive power of decision theories that do not incorporate neuroscientific measurements. Lastly, I outline open questions about the ways that episodic memories are used in decisions, and discuss areas, such as intertemporal choice, patch foraging, and drug addiction, where the potential influence of episodic memory is underexplored.