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 long-past experience to novel situations. These two capabilities are hallmarks of goal-directed behavior – and 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 that do not involve episodic memory. I then review existing theoretical accounts that describe multiple types of decision computations, each of which incorporate episodic memories in different ways.

Synthesizing these lines of evidence, I then propose a unifying framework, *episodic sampling*, incorporating what is known about the relationship of episodic memory to other types of memory, normative considerations, and neuroscientific and psychological evidence about constraints on episodic memory encoding, retention, and retrieval. I discuss novel properties of the framework, with focus on the timecourse of sampling and sequential dependencies between samples, and propose how these properties might impact the study of arbitration between multiple decision systems, and evidence integration more broadly.

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.