Kinds of Semantic Memory Across Kinds of Mind

Words: 857

What kinds of long-term memory do different species have? Most recent literature on this question concerns the distribution of *episodic* memory. Since Tulving (1983), scholars have seen the interesting question as whether episodic memory—seen as special, requiring dedicated neural machinery and a unique phenomenology—is unique to humans. Within comparative psychology, the research agenda has involved experimenters trying to find behaviours which could only be explained through episodic memory, ruling out explanations that appeal to 'mere' semantic representation or associations (e.g. (Clayton et al., 2001, 2003; Clayton & Dickinson, 1998; Crystal, 2021, 2022; Davies et al., 2022, 2024; Davies & Clayton, 2024; Ferkin et al., 2008; Fugazza et al., 2016; Martin-Ordas et al., 2010; Sato, 2021; Sheridan et al., 2024; Templer & Hampton, 2013; Zhou et al., 2012).

Less attention has been paid to what semantic memory might look like in non-human animals. This is an important gap in its own right: semantic memory is crucial to cognition. Species with different forms of semantic memory may have very different forms of mind generally as a result. And many forms of semantic memory are every bit as demanding as episodic memory, raising the possibilities that they arose after episodic memory, building on it (Healy et al., 2024), that simple forms of episodic and semantic memory co-evolved, each enabling the other to become more sophisticated, or that semantic memory and episodic memory are *both* unique to humans (Murray et al., 2017). Furthermore, ignoring semantic memory distorts the debate about episodic memory itself: episodic memory is deeply entangled with semantic memory, with some scholars questioning whether neat distinctions can be drawn between the two at all (Addis & Szpunar, 2024; Aronowitz, 2022; Boyle & Brown, 2025; Brown, 2025; De Brigard et al., 2022; Gentry & Buckner, 2024).

It is therefore vital to consider the distribution of semantic memory, and the forms it might take in different species. However, progress on such questions is hampered by the construct 'semantic memory' itself, which, despite recent efforts at clarity (Addis & Szpunar, 2024; Reilly et al., 2024; Rubin, 2022), runs together very different phenomena with little in common other than not being episodic memory. I distinguish seven such phenomena:

(1) sentence-like representational format
(2) conceptual content (i.e. representing entities in a way which is available to rational inference)
(3) generalising over a large number of experiences
(4) abstraction
(5) serving linguistic communication (e.g. storing information about word meanings)
(6) information organised in a structure shaped by language (e.g. binding together disparate information using associations to words, structures of words as in metaphor, or to linguistically formulated narratives or theories).
(7) Noetic phenomenology

Although there are important connections between some of the phenomena, they are unlikely to hang together as a natural kind. Probably, they are distributed very differently across the animal kingdom. For example, some are associated with having linguistic communication, but it is likely that many entirely non-linguistic animals have states with properties like abstraction and generalisation.

In distinguishing these phenomena, I draw on a rich literature on whether animals could have concepts and beliefs (e.g. Beck, 2013; Bermúdez & Cahen, 2024; Camp, 2009a, 2009b; Danón, 2022; Davidson, 1982; Evans, 1982; Monsó & Danón, n.d.; Peacocke, 1992, 2014; Quilty-Dunn et al., 2023; Rescorla, 2009; Srećković, 2024). I show how framing these traditional issues in terms of memory brings additional insights to the traditional literature, such as focusing attention on issues of encoding, storage and consolidation, memory organisation, and retrieval and reconstruction.

Of these, the idea of memory organisation is most distinctive. The crucial idea is that not all potentially relevant stored information is equally likely to be accessed by cognition at any moment. Sometimes we *cannot* remember key pieces of information, as in the tip of the tongue phenomenon. Even where we *could* recall some information if we were prompted about it explicitly, we may simply fail to do so due to the absence of a helpful cue. Thus, we sometimes miss connections between topics which in retrospect should have been obvious. Memory organisation refers to whatever stable features of the mind shape what is likely to be recalled when. It can include explicit mnemonic devices like acronyms, rhymes, and 'memory palaces' (associating particular pieces of information with locations in an imagined locale), but goes well beyond this: indeed, such devices may sometimes rely on less explicit but more commonly used features of our memory systems (Aronowitz, 2019; Boyle, 2021), and other structuring features include the use of analogies, narratives, and theories to frame or organise bodies of information into surveyable wholes. While memory organisation is closely connected to issues which have been extensively discussed in the literature on beliefs and concepts—Frege puzzles, the possibility of surprising *a priori* discoveries, and debates between dispositionalism and representationalism—such ideas are made much more salient and tractable by a memory framing. And they may be especially important to understanding differences between species. Plausibly, differences in memory organisation make huge differences to what a given species can in practice learn, especially for making connections between different domains and engaging in innovative problem-solving. Furthermore, plausibly there are huge differences in memory organisation across species, due to both language and cognitive architecture.

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