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Search through Memory Structure

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Abstract

Semantic memory encodes both the individual features of concepts and the relations between them. We develop computational memory models that describe how people search through these memory structures. Our empirical paradigm involves open-ended word-pair analogy generation and free association tasks, and we infer the respective roles of featural and relational information in these tasks using formal model comparisons. Our tests reveal that both types of information play a key role in memory search, but they are recruited differently depending on the task and exhibit distinct dynamics. Importantly, we can quantitatively predict these effects and parameterize their associated mechanisms using a principled extension of established memory models, thereby integrating theoretical work on structured reasoning and on memory search.