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Domain-general modal spaces play a foundational role throughout high-level cognition

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Abstract

High-level cognition relies on the ability to determine what the relevant possibilities are in the face of incomplete information. For example, causal judgments require reasoning about the relevant counterfactual possibilities in the context in which the actual events occurred. Similarly, to judge that someone is morally responsible for a given action requires assessing what other actions were available to the agent in the context they acted within. Defining the set of relevant possibilities in a context—what we call the contextual 'modal space'—is computationally intractable both because such contexts are not well defined and because there are indefinitely many possibilities that one could consider. Interestingly though, high-level judgments that require reasoning over such possibilities are often made quickly and effortlessly, suggesting that they may recruit a heuristic or implicit representation of the contextually relevant modal space. In this paper we (1) introduce a sampling approach for empirically describing contextual modal spaces, (2) find that modal spaces are shaped by statistical and prescriptive normality, (3) demonstrate that the contextual modal spaces play a domain general role in high-level cognition in the sense that the same modal space is recruited across different domains of reasoning, and finally (4) we provide evidence that such judgments are made on the basis of heuristic representations of the contextual modal space rather than on-line sampling of relevant alternatives.