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When and Why Do Reasoners Generalize Causal Integration Functions? Causal Invariance as Generalizable Causal Knowledge

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Abstract

The present paper reports an experiment testing two views of how reasoners learn and generalize potentially complex causal knowledge. Previous work has focused on reasoners' ability to learn integration functions that best describe how pre-defined candidate causes combine, potentially interactively, to produce an outcome in a domain. This empirical-function learning view predicts that participants would generalize an acquired integration function based on similarity to stimuli they experienced in the domain. An alternative causal-invariance view recognizes that one's current representation may not yield invariant/useable causal knowledge -- knowledge that holds true when applied to new circumstances. This view incorporates useable causal knowledge as a goal and deviation from causal invariance as a criterion for knowledge revision. It predicts that participants would re-represent causes such that they do not interact with other causes, even when in participants' experience all (pre-defined) causes in that domain interact. Our results favor the causal-invariance view.