Effects of Causal Determinism on Causal Learning Trajectories

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Abstract

Research on causal learning suggests that people are capable of learning nondeterministic causal relations, but might expect causal relations to be deterministic in certain contexts. In two experiments, we demonstrated that peoples expectations of causal determinism are context-sensitive and can influence causal judgments in a sequential learning task. When the data were deterministic (100% success) and participants expected the cause to be deterministic, their causal judgments were at ceiling. When participants expectations were nondeterministic, causal ratings increased with accumulating positive evidence. When the data were probabilistic (75% success), participants exhibited a high violation-of-expectation effect upon seeing the first failed event when they expected the causal relation to be deterministic, and much less so when their expectation was nondeterministic. We built a simple Bayesian model to explain participants violation-of-expectation effect as a selection between two distinct hypotheses: that the causal relation in question is deterministic, and that it is nondeterministic.