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Authors
Coates, Nicole
Siegel, Max
Chu, Junyi
et al.

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Preschoolers' sensitivity to abstract correlations in the properties of sets and functions

Nicole Coates

Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

Max Siegel

MIT, Cambridge, Massachusetts, United States

Junyi Chu

Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

Melissa Kline

MIT, Cambridge, Massachusetts, United States

Josh Tenenbaum

MIT, Cambridge, Massachusetts, United States

Laura Schulz

Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

Abstract

Causal relationships can generate many different kinds of correlations among variables. However, research on children's causal reasoning has focused almost exclusively on just one kind of regularity: the temporal covariation between candidate causes and effects, and in particular, the covariation between interventions and outcomes. Here we show that young children recognize more abstract correlations – in the ways that object properties are distributed over sets, or change over time – and constrain their causal hypotheses accordingly. Specifically, we show that children (range: 48-84 months) distinguish candidate causes based on correlations in the distribution of discrete (set size, arity, and proportion) and continuous (mean and mode) properties of sets (Experiment 1), and also within monotonic, quadratic, and periodic functions (Experiment 2). Keywords: children; causal reasoning; abstract concepts; sets; functions