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Cognitive Dynamics Underlying Rule Induction in Children and Adults

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Abstract: We examined the cognitive dynamics on an inductive reasoning task in which children and adults made predictions about which of two cars would go faster. Participants attempted to induce an underlying rule that was either plausible or implausible, and where one perceptually salient feature (e.g., color) and one less salient feature (e.g., tailfin) were causal factors. On each trial, accuracy, response time, and mouse trajectory data were recorded. Mouse trajectories revealed that participants deviated more from an idealized path to the correct response when there was less perceptual difference between two cars and the underlying rule was implausible relative to trials with perceptually salient differences and a plausible rule. Adults were more accurate and faster than children, but the motor dynamics were remarkably similar. Our data suggest that both global (rule) and local (stimulus features) constraints affected the relative activations of competing representations over single trials and across the experiment.