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Intrinsic relations impair abstract rule learning

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Abstract

Across four experiments, we identified two distinct mechanisms for learning sequential rules: one for capturing arbitrary structures (e.g., a yellow dot followed by a blue dot signals “get ready” then “go”), and another for recognizing intrinsic relationships (e.g., a small dot followed by a big dot signals “get ready” then “go”, perhaps represented by the rule “getting bigger means go”). Both mechanisms support abstract representations, as in Experiments 1 and 2, adults generalized sequential rules to novel combinations. However, Experiment 3 and 4 revealed that when both types of rules were present during learning, intrinsic rules disrupted the abstraction of arbitrary rules. This interference led to poor generalization performance. Overall, these findings suggest that intrinsic and arbitrary systems compete during rule learning, with intrinsic relationships imposing constraints on how sequential patterns are represented. These results are relevant for applications such as syntax learning, human factors, and graphic design.