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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

<https://escholarship.org/uc/item/9j37605r>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 43(43)

ISSN

1069-7977

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Publication Date

2021

Peer reviewed

Children's reasoning about hypothetical interventions to complex and dynamic causal systems

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Abstract

Across 3 studies, we investigated children's ability to consider hypothetical interventions to complex and dynamic causal systems. Five- to 7-year-olds learned about novel food chains and were asked about the effects of the removal of one species on others in the food chain. In Studies 1 ($n = 72$) and 2 ($n = 72$), 6- and 7-year-olds made correct inferences about the effects on remaining species, but performed better when reasoning about direct predators or prey than indirectly-connected species. Five-year-olds' performance was at chance across all question types. In Study 3 ($n = 65$, target $n = 72$), we are currently investigating whether 5-7-year-old children's performance improves when given more background information on the causal dynamics of the food chains. The results indicate that hypothetical thinking about dynamic causal systems develops between 5 and 7 years. This ability may be leveraged for teaching science concepts.