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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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<https://escholarship.org/uc/item/5247k5ms>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 45(45)

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Publication Date

2023

Peer reviewed

Discovering New Functions in Everyday Tools by Children, Adults and LLM's

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Abstract

Humans we manipulate objects in innovative ways to navigate our environment and achieve goals. Our study investigates the ability to discover new object functions (a form of tool innovation) in human children and adults and in large language models such as GPT and FLAN. We introduced 42 three- to seven-year-olds and 40 adults to problem situations in which the typical tools were missing. Participants were asked to choose among objects that were superficially related in terms of taxonomy and perceptual features but functionally useless, objects that were superficially dissimilar but functionally relevant, and objects that were neither superficially nor functionally relevant. Both preschoolers and adults selected functionally appropriate tools, despite the lack of a direct relationship between the functionally appropriate tools and the standard tools used to achieve the relevant goals. In contrast, large language models, which are trained on unprecedentedly immense amounts of text, did not near human-level performance.