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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Permalink

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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 42(0)

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Publication Date

2020

Peer reviewed

Starting small: Exploring the origins of successor function knowledge

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Abstract

Although most U.S. children can count sets by 3.5 years of age, many fail to understand that adding 1 to a set corresponds to counting up 1 word in the count list (i.e., the successor function). Initially, children have piecemeal knowledge of this relation, and do not understand that it holds for any number. Although generalized successor knowledge emerges around 6 years of age, it is unknown when children's item-based learning begins, and therefore when they begin learning relations between number words – a critical precursor to mathematical reasoning. Here, we explore the timescale and mechanisms underlying this knowledge in 2- to 4-year-old children. We find that these children have established item-based mappings, but that they are unrelated to count list knowledge. Instead, we show evidence that the origins of successor knowledge may lie in mappings made between non-symbolic set representations and known number words.