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Does shifting ability support interleaved learning of new science concepts in middle school students?

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Abstract

Prior research has shown that executive function (EF) ability predicts science achievement. Here, we ask whether EF also predicts science learning. We focus on the shifting EF, and predict that students with high (vs. low) shifting ability will be able to better learn new science concepts from interleaved (vs. blocked) instruction than students with low shifting ability. We are evaluating this hypothesis in a study where eighth graders learn about different attributes (origin, texture, composition) of different rock types (igneous, sedimentary, metamorphic) in instruction that is either blocked by or interleaved across rock types. We are measuring shifting using the WCST and local-global tasks. We are collecting post-test and long-term retention measures of learning and transfer. We predict better performance for high (vs. low) shifting individuals and for interleaved (vs. blocked) instruction, and an overadditive interaction because shifting ability is critical for noticing the discriminations that interleaved instruction highlights.