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Proceedings of the Annual Meeting of the Cognitive Science Society

Title

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Journal

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

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Publication Date

2021

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Peer reviewed

Effects of Combining Refutation and Self-Explanation on Student Learning

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Abstract

Misconceptions in science are ubiquitous and difficult to revise, but refutation texts are one effective tool for prompting conceptual change (Tippett, 2010). However, refutation texts are effective only to the extent that students are forming coherent representations. Self-explanation is a well-studied method for increasing coherence of readers' mental representations (Allen, McNamara & McCrudden, 2015). The current study examines the unexplored question of whether these common interventions enhance each other's positive learning outcomes. Two-hundred fifteen UCSD undergraduates were randomly assigned to read either a refutation or an expository text about the phases of the moon, and were prompted to either self-explain or think aloud while reading. Students then took a post-test assessing knowledge of moon phases and related misconceptions. We measured both accuracy and explanatory qualities, such as causality and circularity, in order to assess the relative efficacy of refutation and self-explanation and their combination.