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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, 38(0)

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Publication Date

2016

Peer reviewed

Does Experience with Physics Concepts Improve Mental Rotation Performance?

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Abstract: STEM disciplines have been shown to positively impact an individual's visuospatial skills (Kozhevnikov, 1999). The current study examines improvement in spatial thinking in physics undergraduate students over the course of a semester. Students completed the Shepard and Metzler (1971) task at two time points—beginning and end of a semester – where they were asked to determine if two 3D figures were a match or mirror-images of each other. A Tobii X60 eye-tracker was used to record eye movement as an indirect measure of cognitive strategy selection. Preliminary analysis show a significant improvement in mental rotation performance from time point 1 ($M=31.867$, $SD=5.027$) to time point 2 ($M=35.333$, $SD=3.885$) $t(14)=-3.014$, $p=.009$. A latent profile analysis will be used to model cognitive strategies selected at time points 1 and 2 and analyzed for sex differences. The findings of this study are important for understanding the underrepresentation of women in STEM.