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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, 40(0)

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Publication Date

2018

Supports for Visual Comparison in STEM textbooks

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Abstract

Many science and mathematics concepts involve complex relationships. Educational materials, such as textbooks, often convey these systems through visualizations (e.g., Jee et al., 2010; Mayer, 1993). To abstract the key relationships, students must compare corresponding elements of these visualizations-parts of a structure, steps in a process, etc. Yet, little is known about the ways in which visual comparisons are presented in textbooks. The present study evaluated images in science and mathematics textbooks from top U.S. publishers with respect to the support for visual comparisons. The research team identified several factors that could help vs. hinder visual comparison based on prior research on visual comparison and analogy, including the spatial arrangement of corresponding elements (Matlen, Gentner, & Franconeri, 2014), the number intervening elements between them, and the ways in which comparisons are formally encouraged through both verbal and non-verbal cues.