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Authors
Applebaum, Lauren
Kalal, Gabriel
Spaepen, Elizabet
et al.

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Comparing Two Types of Spatial Alignment During Elementary Engineering Instruction

Lauren Applebaum  
University of Chicago

Gabriel Kalal  
University of Chicago

Elizabet Spaepen  
The Center for Early Mathematics and Science Education

Dedre Gentner  
Northwestern University

Susan Goldin-Meadow  
University of Chicago

Susan Levine  
University of Chicago

Abstract: We explore two types of spatial alignment, overlay and gesture, during an engineering lesson on bridge building. Spatial alignment via juxtaposition (Gentner et al., under review) or overlay (Applebaum et al., in prep) has been found to promote understanding triangular bracing in stable structures. Gestures tracing a triangle may also support learning this concept. We used a 2(Gesture, No Gesture) x 2(Overlay, No Overlay) design to teach children ages 6-9 about triangles in bridges. In Study 1, children learned regardless of condition, but they learned significantly less in the gesture conditions, which used a fast tracing gesture (Δ=-1.62, p=.01; M(improve gesture)=.30, SD=.38, M(improve no gesture)=.48, SD=.33; alignment conditions: Δ=-.05, p>.1; M(improve alignment)=.42, SD=.40, M(improve no alignment)=.38, SD=.34). In Study 2, we presented videos with a slower, deliberate tracing gesture. Preliminary results suggest that gesture can facilitate learning by highlighting the relationship between the individual components shared by the triangle and the larger structure.