

Spatial Alignment Enhances Comparison of Complex Educational Visuals

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Abstract

Grasping relational concepts is facilitated by comparing their representations. Previously, Matlen et al (2014; under review) found that for simple visual figures, the comparison process was optimized when the visuals were placed in direct spatial alignment, such that the main axes of the visuals run perpendicular to their placement (e.g., horizontal figures placed vertically), relative to impeded spatial alignment, when the axes run parallel to their placement. In the present work, we tested this spatial alignment effect using complex naturalistic stimuli, consisting of skeletal structures. Participants identified anomalous bones by comparing a correct skeleton with a skeleton that had an incorrect bone. Participants were more accurate when skeletal structures were placed in direct ($M=.90$) relative to impeded ($M=.84$) alignment ($p<.01$). Given the relevance of these findings to education, we are formally coding visuals in middle-school science textbooks based on their spatial alignment and will present these results at the conference.