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Spatial alignment supports comparison of life science visuals for 7th graders

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Abstract

Visual comparisons are ubiquitous in STEM education. We suggest that visual comparisons are carried out by a structural alignment process that draws correspondences between analogs based on relational structure (Sagi, Gentner, & Lovett, 2012). The spatial arrangement of images can influence visual comparisons by increasing or decreasing competition from incorrect correspondences (Matlen, Gentner, & Franconeri, 2020). The present study tested whether this could be leveraged to help children compare complex STEM-related images. Seventh graders were shown drawings of skeletons containing an anomalous bone, either solo or paired with a correct standard. Children were more accurate at finding the anomaly when given a correct standard to compare to. On especially difficult trials in which skeletons were shown in non-canonical orientations (e.g., a cow oriented vertically), performance was enhanced when the spatial placement of the two skeletons was direct, minimizing competing correspondences. Thus, direct placement may help students compare complex unfamiliar images.