Perceptual Similarity Affects Relational Judgements

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Abstract

In STEM instruction, the effectiveness of teaching by analogy is often limited by students' focus on superficial features of the source and target exemplars; the strategy of progressive alignment (moving from perceptually similar to different targets) has been suggested to address this issue (Gentner & Hoyos, 2017). In contrast, computational models suggest maximizing surface feature variation to improve the relation learning, and human behavioral studies find a relational bias in learning (Austerweil & Ehrens, 2018). Here, participants were explicitly instructed to match stimuli based on relations while perceptual similarity of stimuli varied parametrically. We found that lower perceptual similarity reduced accurate relational matching ($F = 9.53$, $p<.001$), and observed a similar trend for reaction times. This finding demonstrates that perceptual similarity may interfere with relational judgements, but also hints at why progressive alignment may be effective. Implications for instructional sequence design will be discussed.

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