Role vs relational similarity in analogical processing

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Abstract

We tested whether relational knowledge is represented as a set of relations among entities or as a set of relational roles to which entities are bound. Participants performed four relational processing tasks with the same set of word-pair stimuli: relational exemplar generation; similarity ranking; analogical verification; and a paired-associate learning task. In the similarity ranking task, we gathered separate rankings for relational, role and semantic similarity between word pairs. Relational similarity predicted exemplar generation frequencies, analogical verification accuracy and RTs, and relational luring in associative memory. Role similarity predicted exemplar generation frequency, and, weakly, analogical verification RTs. Semantic similarity did not predict any of the tasks, after controlling for the other two factors. Contrary to current theories which posit that semantic similarity is more important for retrieving relevant analogues, and that analogical mapping is based on role-filler bindings, relational similarity was the strongest predictor across all tasks.