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Similarity judgments determine consistency of implicit number conceptions across ages

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Abstract

Previous work has used pairwise similarity judgments among numerals to reveal development in conceptions of number, from exclusively attending to magnitude in kindergarten to including properties like parity in middle school. In adulthood, these representations appear to settle on more advanced number properties. We extend this work with the goal of observing individual rather than group-level number representations by administering pairwise similarity tasks at two separate time points to determine individual consistency. Specifically, we use two 10-item number (and kinship term for comparison) sets exemplifying a variety of mathematical concepts (e.g., primeness) to 48 students across grades 3-7. Multidimensional scaling analyses reveal magnitude as the most pervasive feature and reflect differences in attended numerical features relative to score on a math assessment. Analyses are ongoing, but the consistency of this measure in a short time-frame will validate its usability as a subtle pre- and post-test surrounding concept-specific education or interventions.