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Middle school children’s cognitive perceptions of constructive and deconstructive generalizations involving linear figural patterns.

Summary: This paper discusses the content and structure of generalization involving figural patterns of middle school students, focusing on the extent to which they are capable of establishing and justifying complicated generalizations that entail possible overlap of aspects of the figures. Findings from an ongoing 3-year longitudinal study of middle school students are used to extend the knowledge base in this area. Using pre-and post-interviews and videos of intervening teaching experiments, we specify three forms of generalization involving such figural linear patterns: constructive standard; constructive nonstandard; and deconstructive; and we classify these forms of generalization according to complexity based on student work. We document students’ cognitive tendency to shift from a figural to a numerical strategy in determining their figural-based patterns, and we observe the not always salutary consequences of such a shift in their representational fluency and inductive justifications.

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