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UNDERSTANDING ELEMENTARY SCHOOL TEACHERS' PERSPECTIVES ON CHILDREN'S STRATEGIES FOR EQUAL SHARING PROBLEMS

<u>Naomi Jessup</u> UNC-Greensboro njallen@uncg.edu	<u>Amy Hewitt</u> UNC-Greensboro alhewitt@uncg.edu	Victoria Jacobs UNC-Greensboro vrjacobs@uncg.edu	Susan Empson The University of Texas at Austin empson@austin.utexas.edu
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Over the past several decades, the growing research base on children's mathematical thinking has provided a way for teachers to structure what they see and hear so that they can better respond to children's ideas in the midst of instruction. Research has also shown that learning is enhanced when teaching is focused on children's thinking (Wilson & Berne, 1999). In this study, we worked with teachers who were learning about children's fraction thinking, and our goal was to investigate how teachers thought about children's thinking. In much the same way that understanding children's thinking has helped teachers honor and build on children's thinking, understanding teachers' perspectives can help those trying to support teachers' development.

We explored teachers' initial perspectives on children's strategies for equal sharing problems in which the answer is a fractional amount. Prior to professional development on fractions, teachers in grades 3–5 analyzed written work for 12 student strategies for the following problem: *Six children are sharing 16 brownies so that everyone gets the same amount. How much brownie can each child have?* Coding involved an iterative process of analyzing video- or audio-recorded discussions of groups of teachers who were asked to order strategies in terms of sophistication.

We identified five perspectives teachers used in deciding levels of sophistication of children's strategies: (a) whether leftover items were partitioned; (b) whether whole items were distributed prior to any partitioning; (c) whether the largest possible partitions were used; (d) whether fraction notation was predominantly used (vs. drawing); and (e) whether the answer was in the form of a mixed number (vs. an improper fraction or informal notation). Some of these perspectives were consistent with research on children's fraction thinking (Empson & Levi, 2011) such as when teachers viewed strategies involving partitioning of leftovers as more sophisticated than those which ignored leftovers. Other perspectives, while reflective of traditional curriculum sequencing, were inconsistent with research on children's fraction thinking such as when teachers viewed distributing whole brownies prior to any partitioning as more sophisticated regardless of the nature of the partitions. For example, partitioning all items strategically (e.g., linked to the number of sharers) was viewed as less sophisticated than distributing wholes and then using a more basic partitioning (e.g., repeated halving). Implications for researchers and professional developers include understanding teachers' starting points and potential confusions as well as appreciating the need to honor and build on these perspectives.

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