

## Numbers and patterns and space, oh my! Preschoolers and Parents Explore Math Broadly

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### **Abstract-50 words**

Parent-preschooler play was observed in three contexts (card games, bead-stringing, block building) and coded for exploration of 3 math concepts (number, pattern, space). Dyads explored number most often, especially during card play, and explored space across contexts, especially during block building. Patterns were explored least often, mostly when stringing beads.

### **Background info for your 500-word abstract**

Children's mathematics knowledge prior to formal schooling is important to their future achievement. Specifically, math knowledge at school entry varies substantially (Starkey, Klein, & Wakeley, 2004) and strongly predicts later math and reading skills (Duncan et al., 2007; Jordan, Kaplan, Ramineni, & Locuniak, 2009; Nguyen et al., 2016; Watts, Duncan, Siegler, & Davis-Kean, 2014). Early informal and playful math experiences with parents contribute to children's concurrent and later math understandings (Levine, Suriyakham, Rowe, Huttenlocher, & Gunderson, 2010; Pruden, Levine, & Huttenlocher, 2011; Ramani, Rowe, Eason, & Leech, 2015). However, the majority of this research has focused solely on experiences with one specific domain of math (e.g., only numeracy or spatial), even though math is defined more broadly than numbers or space alone, and individual math domains are strongly interrelated (National Council of Teachers of Mathematics, 2006; National Research Council, 2009; Sarama & Clements, 2004). Further, the little work that has taken a broad approach to measuring early home math experiences primarily utilizes parental reports of these experiences, which can be subject to bias, so findings need validation with observational methods. Thus, research has yet to systematically explore observations of early playful parent-child math experiences broadly, or identify which contexts might be most conducive to exploring certain types of math concepts versus others.

The current study aimed to better understand whether observations of parents and preschoolers' joint math experiences are indeed as broad in nature as parents report (i.e., include number, pattern, and spatial exploration), and whether support of certain domains is more prevalent than of others. We did this by observing parents and preschoolers during play with three math activities chosen to elicit exploration of multiple math domains (i.e., numeracy, patterning, and spatial) and conducting behavioral coding of parent-preschooler math exploration of 3 math concepts (number, pattern, space).