

Preschoolers inability to estimate quantity relates to later math difficulty

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Preschool children who showed less ability to estimate the number of objects in a group were 2.4 times more likely to have a later mathematical learning disability than other young people, according to a team of University of Missouri psychologists. Parents may be able to help their children develop their skills at approximating group sizes by emphasizing numerals while interacting with young children.

"Lacking skill at estimating group size may impede a child's ability to learn the concept of how numerals symbolize quantities and how those quantities relate to each other," said study co-author David Geary, professor of psychological sciences at MU. "Not understanding the values numbers symbolize then leads to difficulties in math and problems in school, which our previous studies suggest may be related to later difficulties with employment."

Geary said that parents may be able to improve a child's innate skill at approximating group size and suggested that caregivers draw children's attention to quantities in everyday situations. For example, after a preschool-aged child completes a series of tasks, a parent can ask the youth how many tasks they completed.

"Talking to children about how the world can be represented in numbers may help young people develop the ability to estimate the size of a group, which may prepare them for later [mathematics education](#)" said co-author Kristy vanMarle, assistant professor of [psychological science](#) at MU. "Asking them 'how many' whenever they encounter a group of

objects or images can help them understand that the world can be understood in terms of numbers."

However, the inability to approximate group size was not the only factor related to later [math problems](#). The MU team also found that preschoolers who lagged behind others in their understanding of the symbolic value of numerals and other related concepts were 3.6 to 4.5 times more likely to show mathematical [learning difficulties](#), which corroborates earlier research by Geary, and extends it to a much younger age.

Doctoral student Felicia W. Chu was the lead author of the study, "Quantitative deficits of [preschool children](#) at risk for mathematical [learning disability](#)," which was published in the journal *Frontiers in Psychology*.

"One major reason I came to the University of Missouri was the psychology department's strong reputation for studying children's mathematical education," said Chu.

Provided by University of Missouri-Columbia

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