Conference focuses on how families can improve math fluency

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Prof. Susan Levine speaks Nov. 17 at a conference on math fluency in young children. A number of UChicago scholars who study math learning spoke at the conference, which was hosted by the University's Science of Learning Center. Credit: University of Chicago

The words "enjoy" and "math" often aren't used together by parents: In many homes, the subject instead is associated with anxiety, stress and

trepidation.

At a recent two-day conference on math fluency in young children, Susan Levine, the Rebecca Anne Boylan Professor in Education and Society, challenged more than 100 attendees to find ways to support parents of young children to integrate math into their daily lives, make the subject engaging and prepare their children to succeed in mathematics before they start school.

"Parents too often avoid engaging their children in mathematical thinking and convey their negative attitudes to their children, and a cycle of math phobia becomes self-perpetuating," said Levine, the inaugural director of the University's Science of Learning Center. "People do what they enjoy, so we have to make math enjoyable for children and parents."

The center focuses on not only the cognitive, but also the affective and cultural dimensions of learning: how emotions, self-conceptions, mindsets and stereotypes shape the learning process.

"The Science of Learning Center is designed not just to ask about the building blocks of learning but also to impact what happens in the classroom and at home," said Sian Beilock, UChicago executive vice provost and the Stella M. Rowley Professor of Psychology, who spoke at the conference and has conducted research on math anxiety.

Variations in parents' use of "math talk" in the home environment (how frequently they talk about number and spatial concepts) are contributing to what Levine described as a "math input gap" that leaves some children at a disadvantage as they enter kindergarten. A 2010 study by Levine and her colleagues showed a 60-fold difference in the parents' use of number words with preschool children—a difference associated with family socioeconomic status, with socioeconomically advantaged children

hearing many more such words prior to entering kindergarten.

These differences contribute to persistent disparities in achievement between more and less advantaged children and thereby to social inequality more generally, given the strong connections between educational achievement and success later in life. "We need to level the playing field," Levine said, because research shows that kindergarten students behind in math tend to stay behind later.

The Science of Learning Center sponsored the Nov. 17-18 conference in downtown Chicago, which was funded by the Overdeck Family Foundation, the Heising-Simons Foundation, the Robert C. McCormick Foundation and the Simons Foundation. It brought together UChicago scholars and other academics, policymakers, teachers, authors, software developers, and business and nonprofit executives. Participants shared knowledge about ways to build family math fluency, identified areas where further research is needed and designed the early features of a campaign to increase family math fluency.

Participants aim to launch a national campaign similar to efforts already underway to promote early literacy, such as Reach Out and Read, which distributes books to young children and gives literacy advice to parents. Such a campaign might involve helping parents support children's mathematical development by integrating practices such as counting and labeling, grouping, comparing, measuring, and recognizing patterns in daily routines such as cooking, getting dressed, shopping, cleaning and setting the table.

The Science of Learning Center, which launched last year, is working to make math a priority in homes in many ways, such as studying the effectiveness of apps parents play with their children and developing and testing the effectiveness of different kinds of children's books, puzzles, games and other toys for supporting children's mathematical

development. Overall, the center is developing ways to help parents understand the value of a strong foundation in math—whether or not they envision their children as future mathematicians.

The center is working with UChicago's Urban Education Institute, the Chicago Public Schools and early-childhood education programs such as Head Start. "The key is that what we learn about what works in the classroom informs policy and practice," Beilock said. "Even after kids start school, the anxieties and attitudes, culture and stereotypes they experience at home continue to be very important."

At the conference, several speakers noted that cultural attitudes in the United States often work against math fluency in young children. "How we feel about math as a nation is not great," Beilock said. "People in most nations are anxious about math to some extent, but in the United States this anxiety tends to be socially acceptable."

While Americans are loath to admit they are illiterate, many freely admit that they are innumerate, or unable to do or understand basic math, Levine added. "In other countries, math fluency is prized whereas here there's almost a club of people who are willing to say, 'I got a D in math,' or 'Math makes my brain hurt.'"

The center is working to change such attitudes by turning research into tools that can be used by teachers, parents, students and others in Chicago and beyond.

"The center is not just about research," said Lisa Rosen, executive director of the center. "It's about building a dynamic reciprocal relationship between research and practice so that the tools we develop will be useful for advancing learning."

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Provided by University of Chicago

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