

Math story time at home bolsters achievement in school

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Larkmead School. Credit: CC-BY-SA-2.5,2.0,1.0

Adding math talk to story time at home is a winning equation for children's math achievement, according to new research from the University of Chicago.

The study from psychologists Sian Beilock and Susan Levine shows a marked increase in [math achievement](#) among [children](#) whose families used Bedtime Math, an iPad app that delivers engaging [math](#) story problems for parents and children to solve together.

Even children who used the app with their parents as little as once a

week saw gains in math achievement by the end of the [school year](#). The app's effect was especially strong for children whose parents tend to be anxious or uncomfortable with math.

The findings appear in the Oct. 9 edition of *Science*. UChicago PhD students Talia Berkowitz and Marjorie Schaeffer are the lead authors of the study, along with senior authors Beilock and Levine.

Previous research from this group has demonstrated the importance of adults' attitudes about math for children's math success. For example, a recent study found that math-anxious parents who help their children with math homework actually undermine their children's math achievement.

The new findings demonstrate that structured, positive interactions around math at home can cut the link between parents' uneasiness about math and children's low math achievement.

"Many Americans experience high levels of anxiety when they have to solve a math problem, with a majority of adults feeling at least some apprehension toward math," said Beilock, professor in Psychology and author of *Choke*, a book about stress and performance. "These math-anxious parents are probably less likely to talk about math at home, which affects how competent their children are in math. Bedtime Math encourages a dialogue between parents and kids about math, and offers a way to engage in high-quality math interactions in a low-effort, high-impact way."

Study participants included 587 first-grade students and their parents. Families were given an iPad installed with a version of the Bedtime Math app, with which parents and their children read stories and answer questions involving math, including topics like counting, shapes and problem-solving. A control group received a reading app that had similar

stories without the math content and questions related to reading comprehension instead. Children's math achievement was assessed at the beginning and end of the school year. Parents completed a questionnaire about their nervousness with math.

The more times parents and children in the math group used the app, the higher children's achievement on a math assessment at the end of the school year. Indeed, children who frequently used the math app with their parents outperformed similar students in the reading group by almost three months in math achievement at year's end.

The app was especially beneficial for children of very math-anxious parents, whose gains in math achievement over the course of the school year were dramatic when they engaged with the math app. Even infrequent use of the math app—once a week —improved children's math performance.

The study highlights the importance of engaging with math outside of the classroom.

"For many families, reading stories is a regular part of a child's home routine. But when it comes to math, [parents](#) widely believe that it is the responsibility of schools, and they pay less attention to their child's math learning at home," said Levine, the Rebecca Anne Boylan Professor of Education and Society in Psychology. "We found brief, high-quality parent-child interactions around math using Bedtime Math increased children's math learning during first grade."

Levine is an expert in cognitive development and early math learning and the inaugural director of the UChicago Science of Learning Center. She is an author of *Quantitative Development in Infancy and Early Childhood* and *Neural Plasticity and Cognitive Development: Insights from Children with Perinatal Brain Injury*.

Beilock is one of the nation's leading experts on the power of anxiety to undermine performance across a wide variety of fields from test-taking, to public speaking, to your golf score. She is the author of *Choke: What the Secrets of the Brain Reveal about Getting it Right When you Have To* and *How the Body Knows Its Mind*.

More information: "Math at home adds up to achievement in school," by T. Berkowitz et al. *Science*, www.sciencemag.org/lookup/doi/10.1126/science.aac7427

Provided by University of Chicago

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