

Brain Imaging Offers Clues to Math Anxiety

By KATIE MOISSE

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Study offers clues for coping to avoid choking.

A peek inside the brains of 32 college students has sparked hope for people overridden with math anxiety – the fear of figures that grinds down grades, not to mention confidence.

Using magnetic resonance imaging, University of Chicago neuroscientists found that math-anxious students were more likely to succeed on tests when areas of their brains responsible for controlling attention, motivation and emotion were active. The study, published today in the journal *Cerebral Cortex*, suggests a shift in mind-set could help keep math anxiety out of the equation.

"People with math anxiety don't have to perform poorly," said study co-author Sian Beilock, an associate professor of psychology at the University of Chicago. "Their success depends on how they marshal their brain power to focus on the task at hand."

Math-anxious students who showed little activation in such brain areas as the caudate, nucleus accumbens and hippocampus scored 68 percent on a math test taken inside the scanner. But those who showed strong activation scored 83 percent – a grade nearly on par with that of nonmath-anxious controls.

The activity did not extend to brain areas typically involved in calculating.

"It's not about activating the areas of the brain involved in doing math," said Beilock. "It's activating brain areas important for attention and motivation that helps math-anxious individuals to succeed."

Beilock said the study results carry an important message for teachers.

"We need to get away from the idea that it's about content," she said. "We need teach ways for students to use the knowledge they have to succeed."

Whether math-anxious people can learn to activate certain brain areas themselves remains to be seen. But in her book *Choke: What The Secrets of the Brain Reveal About Getting It Right When You Have To*, Beilock offers some simple solutions for overcoming performance anxiety – whether it's during a math test, a speech or a even job interview.

"Whatever the stressful situation, it seems to have similar effects on the brain or body," she said. "Focus on why you might succeed instead of dwelling on how you might fail."

Taking 10 minutes before a high-stakes situation to write about goals and worries is one way to tackle anxiety, according to a study by Beilock and colleagues published earlier this year in the journal *Science*.

"There are solutions, and they don't take millions of dollars or thousands of teacher hours," Beilock said. "It might just take 10 minutes."