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Math anxiety? Study examines nerves by the numbers

By Cari Nierenberg

If the prospect of calculating a tip on a dinner bill with family or friends looking on makes you panic, listen up: Your subpar knack for numbers might not always be the problem, suggests a new study. It may well be that your mind gets in the way of your true ability. Your fears of doing math in a pressure-filled situation cause you to worry and perform poorly.

The new report, published in the journal *Emotion*, looked at the reasons why some students succeed on a math test while others flounder. Scientists measured working memory capacity, a mental scratch pad that temporarily stores and processes information, in 73 college students with low and high levels of math anxiety. They also tested saliva for cortisol, a hormone produced in response to stress, before and after participants solved a tough series of math problems.

Researchers wanted to find out whether there was a link between [math anxiety](#), [cortisol levels](#) and [working memory](#).

The performance of students with a low working memory was not affected by stress hormone levels or by math anxiety. It appeared to make the most difference in participants with high working memory -- the most talented individuals.

Students who had higher working memory and were more anxious about math had higher levels of stress hormones after the test and tended to do worse on it. In contrast, those with low levels of math-anxiety and had higher memory capacity also churned out increasing amounts of cortisol during the exam but they did better on it.

"We found that mindset really matters," says Sian Beilock, an associate professor in psychology at the University of Chicago and the study's lead author. If someone is anxious about math and approaches it with dread, that person is likely to interpret the body's physiological reaction to stress -- the racing heart, sweaty palms, and butterflies in the stomach -- as a sign of failure and performs poorly, she

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When worries eat up working memory and when we don't have its full capacity at our disposal, performance suffers, Beilock explains. For highly math-anxious folks, physiological signs of stress send them into a more worrisome state, which deprives people of the brain power they need to excel.

"We were surprised, however, that the same physiological response could lead to excelling on a math test for those who were not anxious about math and looked at the situation in a positive way -- as a challenge," says Beilock, the author of "[Choke: What the Secrets of the Brain Reveal About Getting It Right When You Have To.](#)"

If people who are math-anxious want to succeed under pressure, Beilock suggests students take 10 minutes to [write down their worries on paper](#) before a math test to download them from their minds so they don't pop into their heads during the exam and distract them.

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