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# How to Be a Better Test-Taker

By ANNIE MURPHY PAUL

## THE REALITY

Many capable, hard-working students perform poorly on exams because they've overtaxed their "working memory" — the mental scratchpad on which we combine information from our long-term memory with the specifics of the problem in front of us, in the service of finding a solution.

## THE PROBLEM

"When students are anxious about how they'll do on an exam," says Sian Beilock, a professor of psychology at the University of Chicago, "their worries use up some of their working memory capacity, leaving less of this cognitive horsepower to apply to the task at hand."

## HOW TO

Dr. Beilock, the author of "Choke: What the Secrets of the Brain Reveal About Getting It Right When You Have To," offers two interventions that can free up working memory in students caught in the grip of test anxiety.

The first involves shifting how they interpret their bodies' cues. Faced with a high-stakes situation, almost everyone has some physical symptoms of stress: sweaty palms, a racing heartbeat. But people interpret these cues differently, with important consequences for their performance.

In a study published last year in the journal *Emotion*, Dr. Beilock and four co-authors found that with students anxious about math, the more stress hormone they produced, the worse they did on a test; students with low math anxiety did *better* the more cortisol they produced. "The first group," she said, "felt the rising anxiety in their bodies and reacted by thinking, 'I'm really nervous about this test. I'm afraid I'll fail.'" They choked. "The second group told themselves something like, 'I'm really psyched up for this test! I'm ready to go!'" Dr. Beilock recommends consciously adopting positive self-talk. Remind yourself that damp palms and a pounding heart accompany all kinds of enjoyable experiences: riding a roller coaster, winning a sports match,

talking to someone you have a crush on.

A second approach involves a simple exercise just before a test. For 10 minutes, write about your feelings regarding the exam to clear your mind of test-related concerns, freeing working memory that can be applied to the exam. In a study published last year in the journal *Science*, Dr. Beilock and her co-author, Gerardo Ramirez, said the technique worked both in the lab and in classrooms. Used by a group of ninth graders facing a biology final, the expressive writing task effectively eliminated the relationship between test anxiety and poor test performance: even highly anxious students performed just as well as non-anxious classmates.

## **PLAN B**

Cognitive scientists have not yet settled on how to expand working memory, but there are ways to make it more efficient. We can hold only about four facts or ideas at a time in working memory, but we can pack more information into those four slots by engaging in chunking, linking multiple pieces of information into a few meaningful groups. Phone numbers are a common example of chunking: 3-9-8-1-2-3-4 is easier to retain as two chunks, 398-1234.

More room can also be created in working memory by making mental operations automatic. Practicing a necessary skill until it's second nature — say, memorizing a set of basic equations — relieves the working memory of the need to perform yet one more task during testing. You may know this as studying.