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EDUCATION

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New research shows that teaching kids how to cope with exam stress can lead to better grades

BY ANNIE MURPHY PAUL

THE SOPHOMORE SAT PARALYZED AS THE minutes ticked by. One hour later, time was up for the exam in a statistics class at the University of Nevada, Las Vegas, and he turned in his work: it was completely blank, save for his name.

As any parent or teacher knows, tests can create crippling anxiety in students, and anxious kids can perform below their true abilities. But new research in cognitive science and psychology is giving us a clearer understanding of the link between stress and performance and allowing experts to develop specific strategies for helping kids manage their fears.

These potential solutions are reasonably simple, inexpensive and, as recent studies show, effective. Some of them work for a broad range of students, while others target specific groups. Yet they're mostly unfamiliar to many teachers and parents who remain unaware that test anxiety can be so easily relieved. The Laurel School, an all-girls private school in Shaker Heights, Ohio,

Photograph by Jamie Chung for TIME

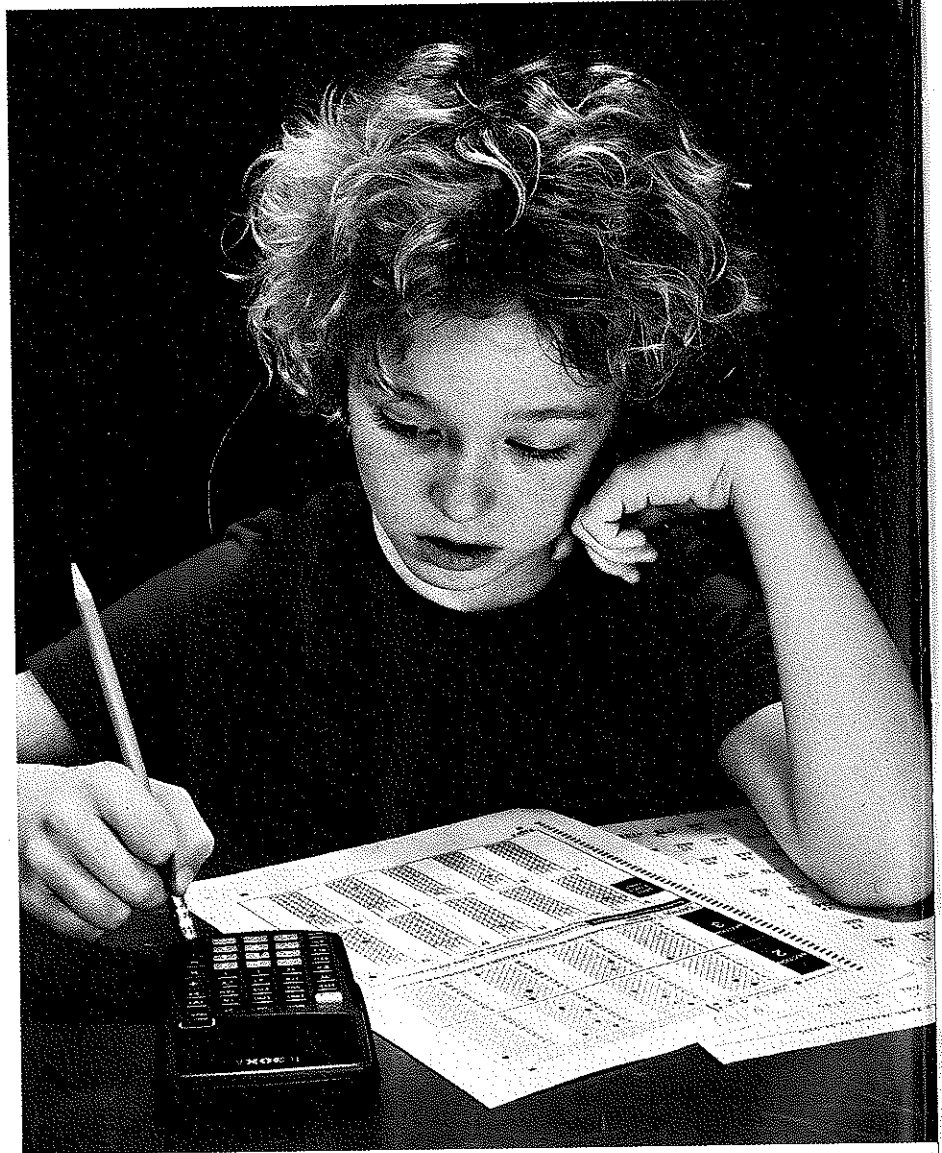
is mounting an all-out campaign against the fears that tests induce. Lisa Damour, a consulting psychologist at Laurel and the director of its Center for Research on Girls, runs student workshops on test anxiety, counsels students about their worries and even hands out pencils with motivational messages on big exam days. "Our efforts to help students manage their test anxiety have definitely made a difference," she says. "The girls—and their teachers—tell me they perform better on tests when they use the techniques we've taught them."

Such interventions may be needed more than ever. In the 12 years since the passage of the No Child Left Behind Act, frequent high-stakes exams have become the norm at every public school in every state in the country. Standardized testing programs cost states a total of \$1.7 billion yearly, according to a recent report from the Brookings Institution. Poor performances on these exams can have severe consequences: students with low scores can be held back, teachers whose students do poorly can be fired, and schools with below-average overall results can be closed entirely. "Schools and teachers are under a lot of pressure to meet standards, and that pressure gets passed on to students," says Nathaniel von der Embse, a psychologist at East Carolina University who studies tests and their stresses. "The prevalence of test anxiety has definitely risen along with the use of test-based accountability."

What's worse, this anxiety can expand over time into any situation in which a student is conscious of being evaluated—from a class presentation to a college-admissions exam like the SAT—and can lead to diminished self-esteem, reduced motivation and disengagement from school. It affects students of all ages and ability levels, according to Mark Ashcraft, chair of the psychology department at UNLV, who taught the student who turned in the blank statistics exam. "Test anxiety can have very long-term effects, affecting an individual's entire life," Ashcraft notes. "People who feel anxious about math tests, for example, may avoid taking math and science classes in high school and college and cut off promising career paths as a result."

ATTACKING ANXIETY

HOW DO YOU EASE THOSE CONCERNS? Much of what researchers have found to work has to do with helping students get out of their own way. Most students with test anxiety manage to get something down on paper, but their capacity to think clearly



and solve problems accurately is reduced by their nervousness, says Sian Beilock, a cognitive scientist at the University of Chicago and the author of *Choke: What the Secrets of the Brain Reveal About Getting It Right When You Have To*. Students taking an exam must draw on their working memory, the mental holding space where we manipulate facts and ideas. "When students are anxious, their worries use up some of their working memory, leaving fewer cognitive resources to devote to the test," Beilock explains.

One method that proved successful in a recent trial is to have students spend 10 minutes writing about their thoughts and feelings immediately before taking a test. The practice, called expressive writing, is used by psychologists to reduce nega-

tive thoughts in people with depression. Beilock and her colleague Gerardo Ramirez tried this intervention both in Beilock's lab, on college students placed in a testing situation, and in a Chicago school, where ninth-graders did the exercise before their first high school final. In both cases, students' test scores "significantly improved," according to an article Beilock and Ramirez published last year in the journal *Science*.

While one might imagine that writing about a looming exam would only heighten anxiety, Beilock says the opposite was the case. "Writing about their worries had the effect of offloading them onto the page so that the students had more cognitive horsepower available to apply to solving problems on the test," she explains. For

TESTING BY THE NUMBERS

3 million

Approximate number of students who take the SAT each year, at nearly 7,000 test centers in more than 170 countries

17

Minimum number of exams a student will take from third to 12th grade to comply with No Child Left Behind

203

Total number of pages in a manual and a separate security supplement that Texas school-district administrators must read in preparation for administering standardized tests

\$22

Annual amount per student Florida spends on testing, up from about \$5 in 1997

104

Number of Chicago public schools that were closed, consolidated, phased out or had their staff replaced from 2001 to 2012, in part because of poor student test scores —KAYLA WEBLEY

SOURCES: THE COLLEGE BOARD; TIME REPORTING; REUTERS (2); CHICAGO PUBLIC RADIO

both groups, Beilock and Ramirez reported in *Science*, “one short writing intervention that brings testing pressures to the forefront enhances the likelihood of excelling, rather than failing, under pressure.”

THE STEREOTYPE THREAT

APPREHENSION ABOUT TESTS CAN BE ESPECIALLY common among minority and female students. That’s because the prospect of evaluation poses for them what psychologists call stereotype threat—the possibility that a poor performance will confirm negative assumptions about the group to which they belong. (Among the specious, anxiety-inducing tropes: girls can’t excel in math and science, and blacks and Latinos aren’t college material.) This additional

layer of anxiety can lead such students to perform below their capabilities. “Girls and black and Latino students are often dealing with a double dose of test anxiety,” says Stanford University psychologist Gregory Walton. “The nervousness everyone feels when they’re being evaluated, plus the worry—conscious or not—that a poor performance will prove that the negative assumption about their group is correct.”

One of Walton’s colleagues at Stanford, psychology professor Geoffrey Cohen, devised an intervention aimed at reducing stereotype threat. Like Beilock and Ramirez’s exercise, it asks students to write briefly, but in this case participants are instructed to choose something they value and describe why it matters to them. “Music is important to me because it gives me a way to express myself when I’m mad, happy, or sad,” one participant wrote. One study showed that this values-affirmation exercise shrank the performance gap between white and black students by 40%. In another, it erased the gender gap in test scores in a challenging college physics course, raising the women’s average grade from a C to a B—higher than the average male student’s grade.

Embracing a positive stereotype can also help, a phenomenon psychologists call stereotype lift. Kaitlin Pethel, a 17-year-old senior at the Laurel School in Ohio, often gets nervous before tests. But she tells herself that there are plenty of reasons for her to feel confident, with the help of a special test-day pencil handed out by her school. Wrapped around the pencil is a small piece of paper that lists some encouraging facts: “Girls get higher grades than boys,” for example, and “Girls from single-sex schools outperform boys and girls from coed schools on standardized tests.” “Reading over those statements is reassuring,” Kaitlin says, “because it reminds me that if I’ve studied hard for the test, there’s no reason I can’t do well.”

These measures may not be enough for everyone. Students who have taken steps to psychologically prepare for tests but still suffer severe anxiety at the prospect of them should consult a mental-health professional.

One step all students can take to improve their performance on tests is to change how they study for them. “Many students have every reason to be nervous before an exam, because they haven’t prepared adequately and don’t know how to do so,” notes Damour, the psychologist at Laurel. “Then they sit down to take the test, and they freak out because they’ve never practiced doing

what the test is asking them to do.” Reviewing class notes and textbooks can familiarize students with the material on a test, but it doesn’t help them take the exam. Damour suggests viewing a test more like a play, with the preparation as a dress rehearsal that replicates the format and time limit of the exam. “You would never just read over your lines and then show up on the opening night of the school play, right?” she says. “It’s the same thing with a test. To be ready for it, practice doing what you’ll have to do in the test-taking situation.”

STARTING YOUNG

EVEN LITTLE KIDS AREN’T IMMUNE TO test anxiety. Researchers have seen evidence of it in students as young as first- and second-graders. Their worries tend to manifest in nonverbal signs that adults may miss, says psychologist Heidi Larson: stomachaches, difficulty sleeping and a persistent urge to leave the classroom to go to the bathroom. “I had one mother tell me that her son had no problem with tests,” recalls Larson, a professor of counseling and student development at Eastern Illinois University. “Then a week later she came back and said that her son had burst into tears the night before the big end-of-year exam, saying that he was afraid he wouldn’t be promoted to the next grade.”

Larson designed an intervention especially for younger students involving breathing and relaxation exercises and examined its effectiveness on a group of third-graders. “We had students lie on mats on the floor of their classrooms. They closed their eyes, and we asked them to focus on their breathing, then on tensing and relaxing groups of muscles in their legs, arms, stomachs and so on,” Larson recounts. “Some of the kids became so relaxed they fell asleep!” A control group of students at another school received no such training. A study published in the *Journal of School Counseling* in 2010 reported that the relaxation intervention had “a significant effect in reducing test anxiety.”

“We all stress out about tests,” says Zach Bennett, a seventh-grader at Charleston Middle School in Illinois who took part in the study. That was three years ago, but when Zach starts to get anxious about a test these days, he still remembers to focus on his breathing the way Larson taught him. “It helps make the nervousness go away,” he says, “and it helps me to realize that the test is really no big deal.” ■

Paul is the author of the forthcoming book *Brilliant: The New Science of Smart*