MENTAL HEALTH

A Single, Quick 'Mindset' Exercise Protects against Adolescent Stress

Reframing erroneous beliefs alleviates the emotional upheavals that beset young people on the cusp of adulthood

By Lydia Denworth on July 6, 2022

Credit: Milko/Getty Images

Close your eyes. Cast your mind back to high school and a high-stakes moment in your most difficult course with your toughest teacher. I'll go first: : Senior year, Mr. Trice, the final exam in AP Physics. I remember where I was sitting. I remember staring at the paper, feeling I didn't know any of the answers. My heart was pounding; my palms were sweating. I was certain I would fail.

There wasn't a happy ending for me about overcoming adversity. I was able to discard my final test score by taking the actual AP exam, which I also bombed. Not surprisingly, I think of that experience as all bad, an enduring embarrassment. But maybe it didn't have to be that way. Recalling such an experience in a new light is step one of a promising new intervention designed to help adolescents reframe stress and anxiety. Step two is arming them with clear, accessible information so that the next time they feel that way, they will see the experience as a path to learning and growth and even a resource to thrive.

A paper published on July 6 in *Nature* reports that this one-time online intervention, which takes about 30 minutes, improved the way young people thought about stressful events (such as my physics test) and their fretful responses (such as my racing heart). The intervention combines growth mindsets, the belief that ability is not fixed but can be developed with effort and support, and stress-can-be-enhancing mindsets, the belief that physiological responses to stress can be an asset. As students work through the exercise themselves, they read information about how the brain builds on experience and how the body uses stress—a pounding heart delivers extra oxygenated blood to the brain, the better to help you think. They see how it works in the real world: there is a story about a calculus professor who greets students on the first day of class with a reminder of the frustrations they will surely feel and the reassurance that struggle is learning. The intervention hints at strategies for success in stressful situations ("Remind yourself feelings of confusion and struggle when doing difficult schoolwork won't last forever"). And it asks participants to write about what they might do differently next time.

Rigorously tested in multiple experiments involving thousands of high school and college students before and during the pandemic, the brief, scalable intervention appears to shift something fundamental: our interpretation of the world around us and our response to it. Compared with those in a control group, participants in the intervention group thought about stress differently, turning it into a means of energizing the motivation to accomplish a goal. But the intervention also changed their physiological responses for the better, triggering the body to respond to events as a challenge rather than a threat. It lowered cortisol levels and improved cardiovascular functioning. It also lessened overall anxiety levels, with lasting effects in some cases.

"Difficulty and struggle are your friend," says Christopher Bryan, a social psychologist at University of Texas at Austin and an author of the new study. Those experiences don't feel good in the moment, he says, "but it's the path anyone who ever became truly excellent at anything had to travel."

The intervention is not just a hypothetical exercise. The stress that adolescents feel has reached alarming proportions. Last December Surgeon General Vivek Murthy declared adolescent mental health a public health crisis exacerbated by the pandemic, and anxiety disorders lead the mental health challenges faced by young people. "If you can shift your mindset about what anxiety is and what it isn't, how to be anxious in the right way, everything changes," says Tracy Dennis-Tiwary, a professor of psychology at the City

University of New York's Hunter College and author of *Future Tense: Why Anxiety is Good for You (Even Though It Feels Bad)*, who wasn't involved in the study. "This paper is a beautiful empirical demonstration of that potential."

Criticisms of some previous mindset research emphasized the lack of statistical rigor or meaningful effects of an intervention on participants. The new paper uses Bayesian analysis, which is widely considered a more reliable measure of the effects of behavioral interventions than other techniques, such as null hypothesis tests of statistical significance. The effect sizes —measuring how strong a finding is—varied from small to large across the six experiments. And as would be expected, they were higher in the laboratory experiments than in the real world. But they were consistently meaningful. "[The study] had broad, multilevel impact on important and well-validated indices of stress and anxiety," Dennis-Tiwary says.

Intriguingly, the intervention did not work for everyone in the same way. "The most vulnerable people in the most stressful time benefit the most," says David Yeager, a developmental psychologist at U.T. Austin and a co-author of the paper. He emphasizes that the intervention is not intended to be used for survivors of trauma and abuse, but administering it broadly does no harm. In addition to addressing mental health issues, a goal of the intervention is to help adolescents engage with challenging courses and projects. In a charter school in one of the experiments, 63 percent of participants passed their math and science classes, compared with 47 percent of students in a control group.

The researchers found that they had to rework a previous growth mindset intervention. That earlier exercise proved effective, especially for low-achieving students, in a national study of more than 12,000 students reported in *Nature* in 2019. But it didn't consider the visceral butterflies-in-your-stomach feeling. "That's a limitation of previous mindset interventions because we forgot about or didn't tap into those stressful emotions," Yeager says.

The usefulness of the new "synergistic" intervention could be considerable, he says, although more study of its lasting effects is warranted. The exercise is currently centered on academic outcomes but could be tailored for use in athletics or in the workplace. It is already used with incoming first-year students in math and science classes at UT Austin. Once it has been more thoroughly tested, Yeager would like to make the intervention freely available to high schools and colleges nationwide. Another way to scale the idea, he says, is to show professors and managers not only how to use the intervention but also how to support the ideas it explores when they talk to young people entering campus life or the workplace.

These researchers don't just want adolescents to reframe the way they think about stress; they want adults to reframe the way they think about adolescents. "We propose an alternative narrative that emphasizes the role of young people in taking on the formidable challenges of the future," they write in the paper. "Our studies suggest that we might not teach adolescents that they are too fragile to overcome difficult struggles, but that we might, instead, provide

them with the resources and guidance that they need to unleash their skills and creativity in addressing big problems."

ABOUT THE AUTHOR(S)

Lydia Denworth is a Brooklyn, N.Y.–based science writer and a contributing editor for *Scientific American*. She wrote about the neuroscience of stuttering in our August 2021 issue. She is co-author of *Parent Nation*.

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