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# Online Mindset Training Protects Adolescents from Unhealthy Responses to Stress

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## INTRODUCTION

Adolescents today are experiencing record-high levels of stress-related anxiety and symptoms of depression. Conventional thinking portrays stress as mostly a bad thing to be avoided. But this “stress avoidance” mentality can disadvantage teenagers, as it may lead many to disengage from potentially beneficial stressors such as demanding academic coursework. Demanding coursework in areas such as mathematics and science, in turn, can prepare adolescents for a competitive and technically demanding labor market.

Elevated levels of stress are a normal feature of adolescence. Adolescents must acquire many social and intellectual skills as they transition to adult social roles and prepare for economic independence. This developmental process is indeed stressful, but it is also part of becoming an adult. Moreover, the social isolation and uncertainty about the future caused by the COVID-19 pandemic have created unavoidable stress.

To protect adolescents from negative mental health effects associated with stress, the authors advocate for a stress optimization approach. This approach is defined as learning to engage positively with rigorous but useful social and academic stressors, rather than always seeking to minimize or avoid stress. The authors combined two existing, scientifically validated mindsets into a single, coherent treatment to teach adolescents how to appraise and optimize stress [1].

The first, the growth mindset, focuses on the idea that intellectual ability is not fixed; a person can develop their abilities by embracing new challenges. It was designed to shape adolescents’ assessments of the stressful demands on them - encouraging them to think of difficult challenges not as hazards to be avoided but as valuable opportunities for self-improvement. The second, a stress-can-be-enhancing mindset, helps young people to see their body’s natural stress response - such as a racing heart, heavy breathing, sweaty palms - as a helpful resource that evolved to support peak performance under stress. Appraising their stress response in this way empowers a young person to take advantage of it to perform well, rather than viewing stress as a problem to be avoided.

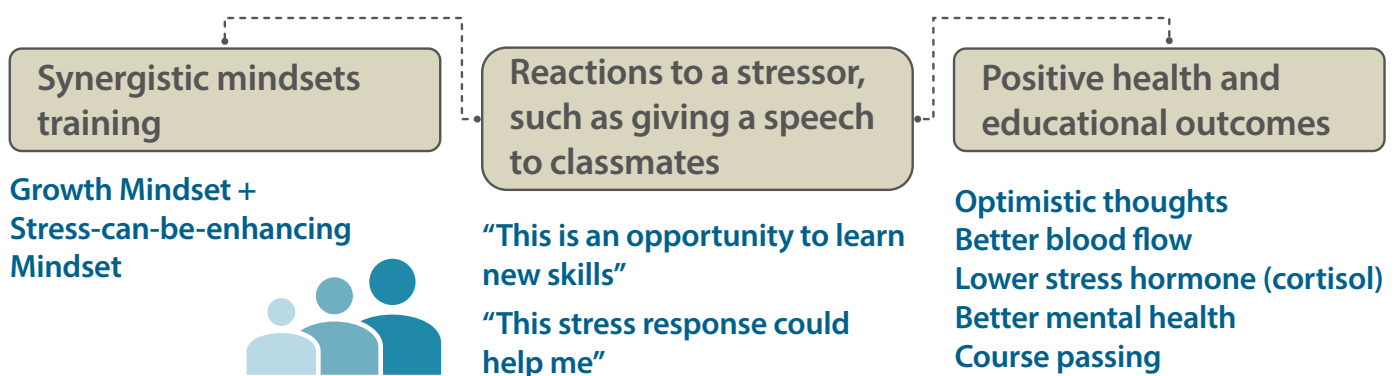
The authors conducted six related studies to test the efficacy of the self-administered, online 30-minute module of combined mindsets training on the stress experienced by young people. The 4,291 high school and undergraduate college students in the studies ranged in age from 13 to 25 years and were randomly assigned to the training or control module. All studies focused on educational stressors, such as taking a timed quiz, giving a speech to classmates, or keeping up with academic work during COVID-19-related school closures.

The authors used a Bayesian statistical analysis approach that uses machine learning tools to model covariates (and their complex interactions), and to model heterogeneous effects. This innovative approach increases confidence in the research findings.

## KEY FINDINGS

- ▶ The combination of the two mindsets – growth and stress-can-be-enhancing – is more powerful than either of the component mindsets alone. In other words, teaching adolescents about the two mindsets together had synergistic effects.
- ▶ Together, the synergistic mindsets training helped adolescents to engage with challenges rather than avoid them, and to harness the body’s natural resources to help them succeed when the demands of challenging pursuits felt the most intense.
- ▶ Specifically, the synergistic mindsets training resulted in:
  - ▶ **Improved cognitive appraisals:** for example, by young people believing that they can handle intense stressors;
  - ▶ **Improved cardiovascular responses:** total peripheral resistance, a key physical indicator of stress responses, was reduced;
  - ▶ **Reduced cortisol levels:** daily salivary cortisol levels, a hormonal indicator of unhealthy responses to daily stress, were lower;
  - ▶ **Reduced daily stress and reduced sense of low self-worth:** the intervention protected against the negative mental health effects of the most intense, negative stressors;
  - ▶ **Improved academic achievement:** course pass rates were higher, particularly for math and science courses;
  - ▶ **Improved outcomes during the 2020 COVID-19 university closures:** during the unavoidable stress of the COVID lockdowns, psychological well-being and academic success were improved and anxiety was reduced.
- ▶ Overall, the intervention’s effects were greatest for participants who had negative mindsets prior to completing the online module. However, some benefits—including lower cortisol levels and improved academic achievement—were found regardless of a participant’s prior mindsets.

## Synergistic mindsets training helped adolescents engage with challenges and resulted in positive health and educational outcomes



This figure shows the ways that adolescents who received the 30-minute online synergistic mindsets training were encouraged to appraise and optimize educational challenges. It also shows the ways the training improved their health and other outcomes.

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## POLICY IMPLICATIONS

This research demonstrates a potentially powerful, low-cost and easy-to-use tool for addressing adolescents' stress. Instead of teaching adolescents that they are too fragile to overcome difficult struggles, parents, teachers, mentors, and coaches could provide adolescents with the resources and guidance they need to unleash their skills and creativity in addressing big problems. However, before this intervention is scaled nationally to help reduce adolescent stress, the authors note that the effects of the synergistic mindsets intervention should be more fully assessed in large-scale trials in diverse populations and contexts. Such studies may inform decisions about how best to scale-up and implement the intervention for widespread use.

**For free access to the online synergistic mindsets intervention program, contact the Texas Behavioral Science and Policy Institute at [txbspi@prc.utexas.edu](mailto:txbspi@prc.utexas.edu).**

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## REFERENCE

[1] Yeager, D.S., Bryan, C.J., Gross, J.J., Murray, J.S., Krettek Cobb, D., Santos, P.H.F., Graveling, H., Johnson, M., & Jamieson, J.P. (2022). A synergistic mindsets intervention protects adolescents from stress. *Nature* 607: 512–520. <https://doi.org/10.1038/s41586-022-04907-7>

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