

What We Know About Growth Mindset from Scientific Research

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GROWTH MINDSET: WHAT IS IT?

A growth mindset is the belief that intelligence can be developed. Students with a growth mindset understand they can get smarter through hard work, the use of effective strategies, and help from others when needed. It is contrasted with a fixed mindset: the belief that intelligence is a fixed trait that is set in stone at birth.

WHY DOES IT MATTER?

Students' beliefs about intelligence have important consequences for how they experience school and how they respond to setbacks and adversity. When students hold a fixed mindset, school can be a threatening place because they may be worried

about proving their ability or avoiding "looking dumb." This can lead students to avoid challenges and give up when they struggle. But when students hold a growth mindset, they may experience school as an exciting place to grow, embracing challenges as opportunities to develop mastery.¹

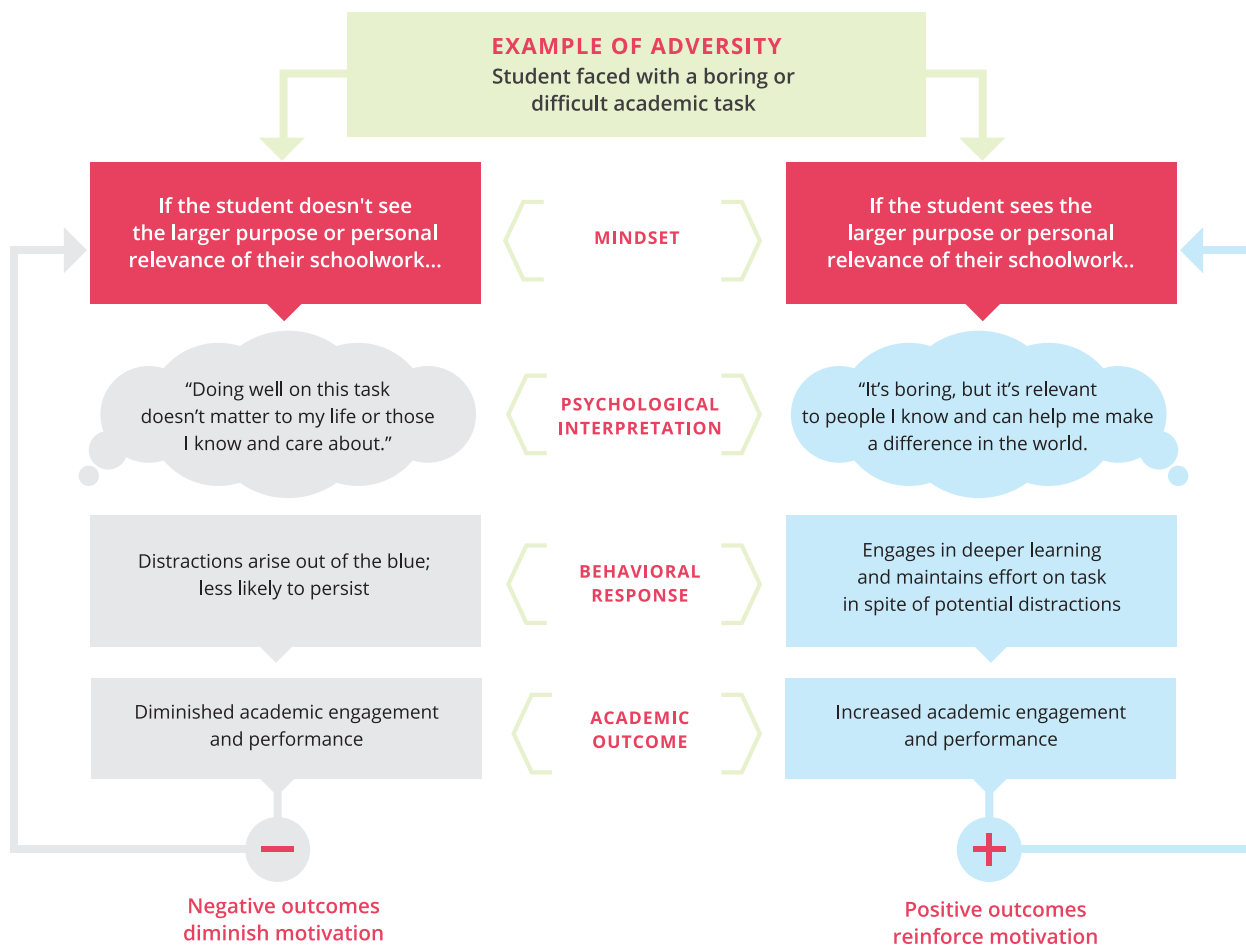
	FIXED MINDSET	GROWTH MINDSET
Definition	Belief that ability is a <i>fixed</i> trait that cannot change	Belief that ability is <i>malleable</i> and can be developed
Interpretation of effort	Effort is <i>bad</i> ; if you're smart, you shouldn't have to work hard	Effort is <i>good</i> ; it's how you get better
Motivation in school	What matters is looking smart, so you can <i>prove</i> your ability	What matters is learning, so you can <i>improve</i> your ability
Behavioral response to academic setbacks	<i>Helplessness</i> ; setback is a sign that you don't have what it takes	<i>Resilience</i> ; setback is a sign that you need to work harder or try a new strategy
Meaning of failure	Failure is the <i>end of the story</i> ; time to give up	Failure is the <i>beginning of the story</i> ; time to try again

SOURCE: MASTER, A. (2015). PRAISE THAT MAKES LEARNERS MORE RESILIENT. MINDSET SCHOLARS NETWORK.

MINDSET
SCHOLARS
NETWORK

Hosted at the Center for Advanced Study in the Behavioral Sciences at Stanford University, the Mindset Scholars Network is a group of leading social scientists dedicated to improving student outcomes and expanding educational opportunity by advancing our scientific understanding of students' mindsets about learning and school.

Students' mindsets about ability shape their responses to adversity in school



When students hold a fixed mindset, school can be a threatening place

When students believe that intelligence is something you either have or you don't have, their main goal in school is to show how smart they are—or hide that they're not smart. Therefore, they tend to value getting the best grades over learning. This can make school a stressful experience.

Similarly, these students view effort and struggle negatively. They think, "If I have to try, then I must not be very smart." When they struggle, they conclude that they've discovered something they're not smart at. Given these reactions, it is not surprising that students holding a fixed mindset tend to falter in the face of challenges.

When students believe intelligence is something that can be developed, they value learning and mastery. Since school provides this opportunity to learn, it can be a motivating and engaging place.

In contrast, students with a growth mindset experience school as an exciting place to learn and grow

When students believe intelligence is something that can be developed, they value learning and mastery. Since school provides this opportunity to learn, it can be a motivating and engaging place.

Similarly, students with a growth mindset view effort and struggle more positively. They see effort as a way to learn and develop their intelligence, and they understand that struggling with a task they haven't yet mastered is the only way to grow. Because of their interpretations of effort and struggle, students with a growth mindset are more likely to thrive in the face of challenges.

Students' differing interpretations of school and learning lead to differences in performance

Researchers recently examined the relationship between 10th grade students' mindsets and performance on a national achievement test in Chile.² Students who held a growth mindset were three times more likely to score in the top 20% on the test, while students with a fixed mindset were four times more likely to score in the bottom 20% (See Figure 1).

WHAT WE'VE LEARNED ABOUT HOW TO PROMOTE A GROWTH MINDSET

Researchers have found that it is possible to promote a growth mindset by teaching students about neuroscience evidence showing that the brain is malleable and gets stronger through effort, trying new strategies, and seeking help when necessary. Researchers have also learned that we can encourage students to adopt more of a growth mindset by changing the way in which we interact with them.

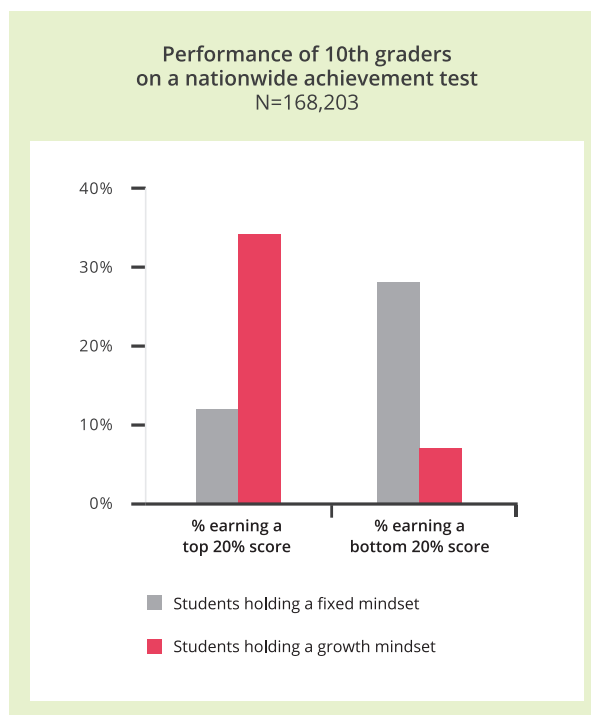
Exposing students to neuroscience evidence about the malleability of the brain

Researchers have found that one way to help students develop a growth mindset is by teaching them about neuroscience evidence that shows the brain is malleable. In these programs, students learn that the brain is like a muscle—when you challenge it, it gets stronger. Importantly, students also learn that sheer effort is not enough. The right strategies and advice from others are equally important for strengthening the brain.

Crucially, mindset programs such as these do not simply tell students to adopt a growth mindset. They help them understand why effort, the right strategies, and good advice are important—because these actions help students develop their intelligence. And by asking students to write about what they've learned in service of other students who are struggling, students come to internalize the message themselves.

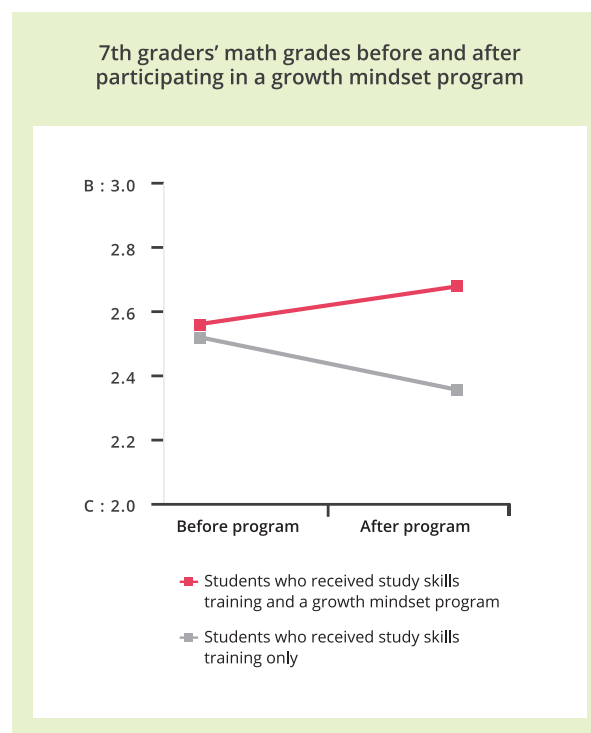
In multiple studies with thousands of students across the country, researchers have found that students who receive these programs earn more course credits, higher grades, and higher standardized test scores.³

FIGURE 1. Students holding a growth mindset were far more likely to score in the top 20% on a nationwide achievement test



SOURCE: CLARO, PAUNESKU, & DWECK, UNDER REVIEW

FIGURE 2. 7th graders who received a growth mindset program avoided the downward trajectory in math grades that is typical in middle school



SOURCE: BLACKWELL, TRZESNIEWSKI, & DWECK, 2007

**By changing the way in which we interact with students,
we can encourage them to adopt more of a growth mindset.**

Changing parents' and teachers' everyday interactions with students

Researchers have also observed that parents' and teachers' everyday interactions with students can create mindsets that support or undermine resilience.⁴

By changing the way in which we interact with students, we can encourage them to adopt more of a growth mindset. For example, students adopt a growth mindset when adults focus praise on process rather than ability.⁵

Examples of how ability praise can be reworded as process praise that promotes a growth mindset

TURNING ABILITY PRAISE...	...INTO PROCESS PRAISE
See, you are good at English. You got an A on your last test.	You really studied for your English test and your improvement shows it.
You got it! I told you that you were smart.	I like the way you tried all kinds of strategies on that math problem until you finally got it.

This brief was edited by Lisa Quay, Managing Director of the Mindset Scholars Network, and David Yeager, Co-Chair of the Mindset Scholars Network.

¹ Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist*, 47(4), 302-314.

² Claro, Paunesku, & Dweck, under review.

³ Paunesku, et al., 2015. Yeager, D.S., Paunesku, D., Walton, G., & Dweck, C.S. (2013). How can we

instill productive mindsets at scale? A review of the evidence and an initial R&D agenda. *A White Paper prepared for the White House meeting on "Excellence in Education: The Importance of Academic Mindsets."*

⁴ Tworek, C. M., Pomerantz, E., & Cimpian, A. (2015). Parents' conversations with children about math: An investigation of the role of parents' ability mindsets.

Manuscript in preparation.
Haimovitz, K., & Dweck, C. S. (2015, March). Failure mindsets: A parent variable that predicts children's intelligence mindsets. In K. Haimovitz (Chair), *How parents' beliefs and practices shape children's achievement motivation*. Symposium conducted at the meeting of the Society for Research in Child Development (SRCD), Philadelphia, PA.

⁵ Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, 75, 33.