



2018 Brock International
Prize in Education Nominee

Carol S. Dweck

Nominated by Casey Cobb

Brock Nominee:

Carol S. Dweck

**Lewis and Virginia Eaton Professor of Psychology
Professor of Education (by Courtesy)
Stanford University**



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Introduction to Carol Dweck

Carol S. Dweck, Ph.D., is a leading researcher in the field of motivation and is the Lewis and Virginia Eaton Professor of Psychology at Stanford. Her research focuses on why students succeed and how to foster their success. Dr. Dweck is an expert in the area of fixed vs. growth mindset: the belief that intelligence is fixed (you either have it or you don't) vs. the belief that intelligence can grow with nurturing and hard work. Her research shows that people who believe intelligence is fixed and people faced with stereotype threat perform more poorly than those who believe intelligence can grow or who reject the shortcomings implied by stereotypes. Her work has demonstrated the role of mindsets in success and has shown how praise for intelligence can undermine people's motivation and learning.

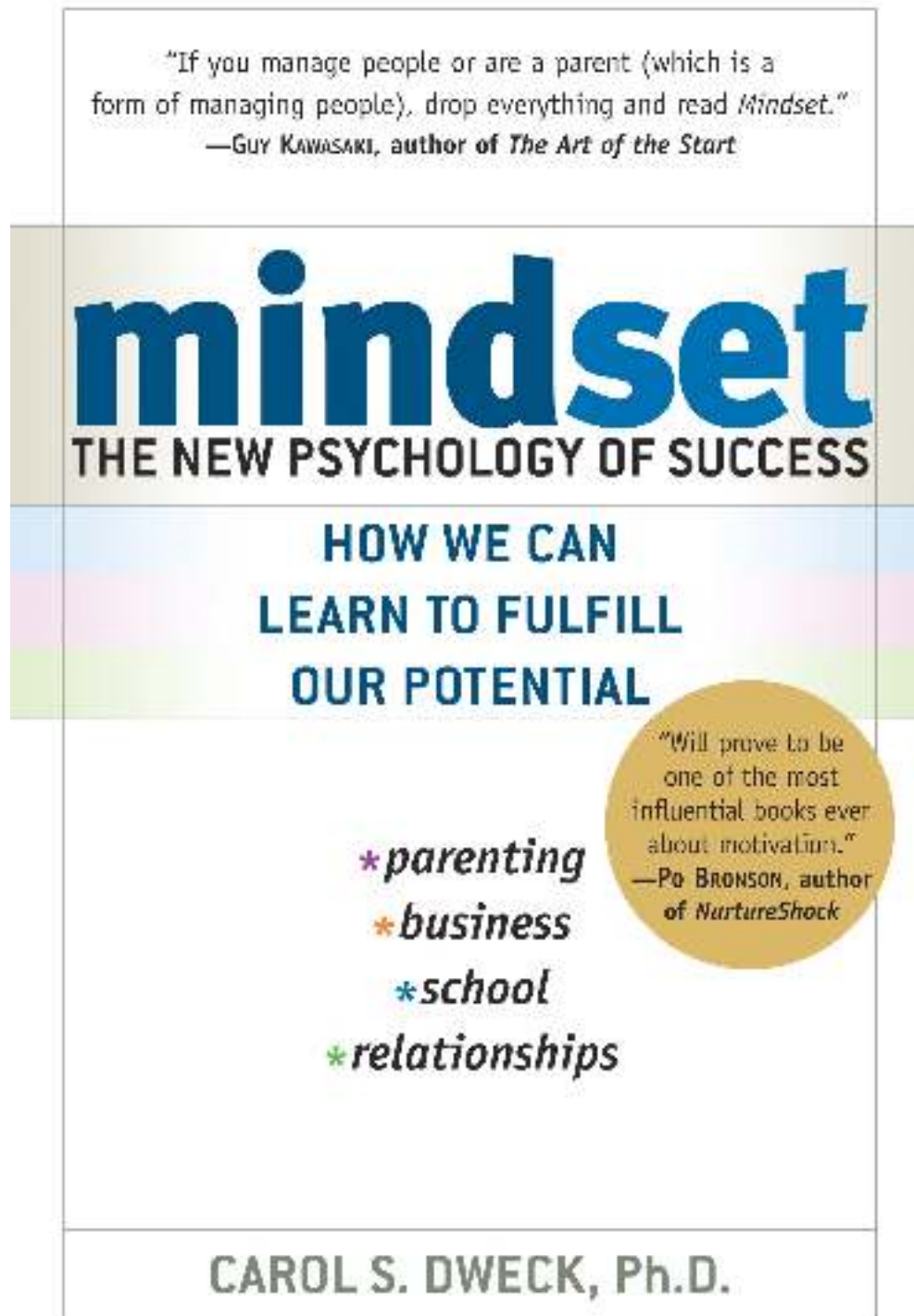
Dr. Dweck has held professorships at and Columbia and Harvard Universities, has lectured to education, business, and sports groups all over the world, and has been elected to the American Academy of Arts and Sciences and the National Academy of Sciences. She recently won the Distinguished Scientific Contribution award from the American Psychological Association, the highest award in Psychology.

Her work has been prominently featured in such publications as The New Yorker, Newsweek, Time, The New York Times, and The London Times, with recent feature stories on her work in the San Francisco Chronicle and the Washington Post, and she has appeared on such shows as Today, Good Morning America, NPR's Morning Edition, and 20/20. Her bestselling book *Mindset* (published by Random House) has been widely acclaimed and has been translated into 20 languages.

Quick Hits:

- Her Stanford University [profile](#)
- **A 3-minute interview** with Carol Dweck on [The Growth Mindset](#) by Sal Khan of Khan Academy
- **A 10-minute TED talk** on [Developing a Growth Mindset](#) by Carol Dweck
- The cover story from the Stanford Alumni Journal presents a nice overview of Carol and her work. [“The Effort Effect”](#)
- A short news article on Carol in the UK's [SchoolsWeek](#)
- Carol and her graduate students developed this free, online program called [PERT](#) (<https://www.perts.net/>), which provides platforms to deliver and evaluate mindset interventions online.

Her groundbreaking book, *Mindset*.



Abstract for *Mindset*

After decades of research, world-renowned Stanford University psychologist Carol S. Dweck, Ph.D., discovered a simple but groundbreaking idea: the power of mindset. In this brilliant book, she shows how success in school, work, sports, the arts, and almost every area of human endeavor can be dramatically influenced by how we think about our talents and abilities. People with a *fixed mindset*—those who believe that abilities are fixed—are less likely to flourish than those with a *growth mindset*—those who believe that abilities can be developed. *Mindset* reveals how great parents, teachers, managers, and athletes can put this idea to use to foster outstanding accomplishment.

Praise for *Mindset*

“A good book is one whose advice you believe. A great book is one whose advice you follow. This is a book that can change your life, as its ideas have changed mine.”—**Robert J. Sternberg, co-author of *Teaching for Wisdom, Intelligence, Creativity, and Success***

“An essential read for parents, teachers [and] coaches . . . as well as for those who would like to increase their own feelings of success and fulfillment.”—***Library Journal* (starred review)**

“Everyone should read this book.”—**Chip Heath and Dan Heath, authors of *Made to Stick***

“One of the most influential books ever about motivation.”—**Po Bronson, author of *NurtureShock***

“If you manage people or are a parent (which is a form of managing people), drop everything and read *Mindset*.”—**Guy Kawasaki, author of *The Art of the Start 2.0***

SUMMARY OF CAROL DWECK'S INNOVATIVE THEORY AND APPLICATION OF A "GROWTH MINDSET"

Carol Dweck's research on lay theories of intelligence is revolutionizing education. It is helping to create better school environments and promoting learning and achievement for millions of children. In both scientific publications of the highest caliber (e.g., in *Science*), in her bestselling book, "Mindset: The New Psychology of Success," and in high-profile (e.g., TED: https://www.ted.com/talks/carol_dweck_the_power_of_believing_that_you_can_improve) talks, Dr. Dweck explores a fundamental distinction. People can believe that intelligence is fixed—that you either have it or you do not. From this perspective, struggle and setbacks in school are a sign of inability, and students respond by withdrawing effort. But people can also believe that intelligence can grow—that with hard work, help from others, and good strategies you can get smarter tomorrow than you are today. With this "growth mindset," challenges and setbacks are a sign that one has not mastered the material yet, and students respond by increasing their efforts or finding new ways to learn. Moreover, as Dr. Dweck and her collaborators have shown, a growth mindset can be taught and when this is done students' performance arises. Moreover, the greatest benefits are often for the most struggling students—because it is for them that struggles in school can be most threatening. They are most likely to infer after a setback that they are "dumb" or "not good at math" and then withdraw.

Following early theorizing (e.g., Dweck, 1986; Dweck, & Leggett, 1988) and laboratory experiments (e.g., Mueller & Dweck, 1998), Dr. Dweck and colleagues developed a 6-session workshop to teach a low-income, ethnic-minority group of middle school students a growth-mindset (Blackwell, Trzesniewski, & Dweck, 2007). Whereas students randomized to the control condition showed continued decline in their math scores, those who received the growth-mindset message showed a rebound in performance and higher final grades. Since this seminal study, growth-mindset interventions have caught fire. Brief online modules created by Dr. Dweck and her doctoral students that teach the growth mindset can reach tens-of-thousands of children and, when this was done, raised grades and successful course completion, especially among struggling students (Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015). Such modules are now being scaled nationally in the United States, (<http://mindsetscholarsnetwork.org/about-the-network/current-initiatives/national-mindset-study/>). Moreover, innovative schools and education networks are increasingly attuned to the importance of mindsets, and incorporating mindsets in their policies and recommendations. Dr. Dweck's research represents the very best of research in education: A basic theoretical understanding of a critical factor that shapes students' learning; the development of techniques to address this factor; and the development of means to scale these techniques across diverse populations to help millions of children achieve their potential.

CAROL DWECK'S RESEARCH

Dr. Dweck shows in her research that an important determinant of whether students persist in the face of setbacks in school or withdraw their effort is their implicit theory of intelligence. Some students view intelligence as a fixed quality that a person either possesses or does not. Others view intelligence as a malleable quality that increases with effort and learning (Dweck, 1986; Dweck & Leggett, 1988). Students with a fixed view tend to perceive failure as evidence of their inability—that they cannot succeed. In response, they may curtail their effort and perform worse. But students with a growth view tend to perceive setbacks as evidence they have not mastered the material yet. In response, they may increase effort, seek out more effective learning strategies, and perform better over time. For example, Blackwell and colleagues (2007, Study 1) tracked students' theories of intelligence as they entered junior high school. Although students with the fixed and growth theory entered junior high with the same past achievement scores, their math grades diverged over the next two years. This divergence was due to the fact that students with the two theories reacted differently to challenges and setbacks, with the growth theory predicting more resilient, effort-based reactions. Notably, only theories of intelligence, and not prior achievement, predicted changes in math achievement.

Many major societal problems like poverty are defined by a lack of resources. Yet even in this case, one pathway to poor outcomes involves people's beliefs and, in particular, their beliefs about the nature of intelligence. In a recent study of all 10th graders in Chile ($N=168,552$), Dr. Dweck and colleagues found that students from lower income families were more likely to endorse a fixed mindset about intelligence, a perceived limitation that may predictably arise from a childhood without adequate resources (Claro, Paunesku, & Dweck, 2016). Moreover, mindsets about intelligence were as predictive of achievement test scores as family income, and were predictive at every income level. The results suggest that one mechanism by which poverty undermines school achievement is by inspiring toxic inferences. As Claro, Paunesku, and Dweck write, this does not mean “that teaching students a growth mindset is a substitute for systemic efforts to alleviate poverty and economic inequality... Rather...research on psychological factors can help illuminate one set of processes through which economic disadvantage leads to academic underachievement and reveal ways to more effectively support students who face additional challenges because of their socioeconomic circumstances” (p. 8667).

GROWTH-MINDSET INTERVENTIONS

Indeed, interventions that teach students that intelligence is malleable (*a growth-mindset intervention*) can raise achievement over time. If students learn that intelligence can be developed by taking on challenges, they outshine peers who do not receive this message. Blackwell and colleagues (2007, Study 2) randomly assigned 7th grade students to one of two workshops. In the growth-mindset workshop, students learned how intelligence can “grow” through effort and learning. They also learned study skills with which to put their growth theory to practice. In the control workshop, students learned only the study skills. Both groups had shown declining math grades prior to the workshop and the control group continued to decline.

Although they had learned effective study skills they were not motivated to put them to work. In contrast, students in the growth-theory condition showed a rebound in math grades and earned higher final grades. In addition, teachers, who were blind to students' condition, singled out three times as many students in the growth-theory condition as having shown marked increases in their motivation in school, such as paying more attention in class and asking for extra tutoring.

Students who face negative racial or ethnic-stereotypes can be at heightened risk from the view that intelligence is fixed. The stereotypes, common in many societies, that “girls are bad at math” and that “racial minorities are unintelligent” allege fixed inability. Thus a growth-mindset intervention may be especially helpful for these students. Indeed, Aronson and colleagues (2002) found that the message that intelligence “grows like a muscle” raised the academic performance (GPA) of African American and European American university students and differentially increased African American students' enjoyment of and valuing of school. Among middle school students, Good and colleagues (2003) found that a growth-mindset intervention narrowed the achievement gap between girls and boys on a statewide standardized math test at the end of the school year.

SCALING GROWTH-MINDSET INTERVENTIONS

A critical question involves how mindset interventions can be delivered to large numbers of students with high fidelity and at low cost (Yeager et al., 2013; Yeager & Walton, 2011). One way is through the Internet. With support from foundations and the United States government, Dr. Dweck and doctoral students Dave Paunesku and Carissa Romero developed PERTS (www.perts.net), which provides platforms to deliver and evaluate mindset interventions online. For instance, secondary teachers may sign up online, bring their students to a school computer lab where PERTS randomizes students to condition and delivers intervention materials, and then later upload grade and other data. PERTS analyzes the results and summarizes them for teachers, who provide feedback on the process and interventions. This dramatically lowers the cost in time, money, and resources needed to deliver and evaluate mindset interventions, for both researchers and educators. It also makes interventions available to any student with Internet access, including students far from research centers or who are geographically dispersed.

In a seminal study using this platform, Dr. Dweck and colleagues tested growth-mindset interventions among 1,594 students attending 13 high schools (public, charter, and private) across the United States (Paunesku, Walton, Romero, Smith, Yeager, & Dweck, 2015). The intervention was delivered in one to two class sessions at the school computer lab. At the end of the term, students at-risk for high school dropout showed higher core academic GPAs and, further, were more likely than control students to have completed core courses satisfactorily (49% vs. 41%). Overall, the mindset treatment led the 367 at-risk students to earn satisfactory grades in 87 more courses than would be expected based on control-group rates (for a replication study, see Yeager, Romero, et al., 2016). By vastly reducing the cost of high-fidelity intervention delivery, PERTS greatly expands the sample sizes of students in intervention trials—and a way to address long-standing problems in education at a socially meaningful scale.

Building on the success of this study, Dr. Dweck and colleagues raised funds and contracted with a research firm to test this approach in a nationally representative sample of United States public high schools. This study is now in the field. The purpose is to further understand educational contexts and student sub-groups who benefit most from the intervention. To prepare for this study, Dr. Dweck and colleagues first underwent a design process to revise and improve the intervention, and tested it with a pilot sample (Yeager, Romero, et al., 2016). In 2015-2016, the intervention was delivered to over 19,000 9th grade students in 76 randomly sampled high schools across the United States (94% student response rate, 55% school response rate). Although grade data are not yet available, early findings show that students in the growth-mindset group were far more likely than those in the control group to select challenging math problems when they constructed a math worksheet for themselves. Challenge seeking is a key characteristic of a growth-mindset learner.

More broadly, this study will help show how the causal effect of an individual growth mindset depends critically on social processes, resources, and allocation of resources across settings. Knowing the kinds of schools and classrooms where mindset interventions are most effective, not effective, and what factors can make them more effective, will inform policy about efficient means to reduce educational inequality. In addition, by using a design involving the gold standard both for causal inference (an experiment) and for generalizability (a probability sample), this study will inform theory for diverse scholars and policymakers.

The PERTS platform has also empowered large-scale trials of growth-mindset and related interventions in the transition to college. The summer before students enter college is a time when colleges and universities can reach entire incoming classes with online materials. Embedding mindset interventions among other prematriculation materials (e.g., roommate preference forms), colleges and universities can reach nearly all new students year after year at. To evaluate mindset interventions in this context, Dr. Dweck and colleagues created scalable online exercises and delivered these, on a randomized basis, to 90%+ of first-year college students from three institutions in the summer before college matriculation (total $N > 9,500$). In one trial, one intervention raised first-year full-time enrollment among predominantly low-income, African American students exiting a public high school system and attending 70+ 2- and 4-year colleges and universities by 9 percentage-points (Experiment 1). In other trials, the interventions reduced institutional achievement gaps in full-time enrollment and first-year GPA by 31-40% (Yeager et al., 2016). Notably, the success of these interventions led all three institutional partners to deliver the validated interventions on an ongoing basis to all future students.

GROWTH-MINDSET PRACTICES

Other research examines how to embed adaptive a growth-mindset in education practice. In a seminal series of laboratory experiments, Dr. Dweck showed that praising intelligence can send the message that intelligence, rather than effort, determines success (Mueller & Dweck, 1998). In these studies, 5th-grade children who worked on moderately difficult IQ problems and received either fixed-mindset praise (“You must be smart at these problems”) or effort praise (“You must have worked hard at these problems”). They then attempted a second set of IQ problems, which were extremely difficult and on which all students performed poorly. Students who received the fixed-mindset praise inferred that they were not skilled at the puzzles and performed worse on a

later set of moderately difficult puzzles than those who received the effort praise.

In field research, O'Rourke and colleagues (2014) rewarded effort, strategy use, and improvement in a math game Brainpoints that taught fractions. As compared to a standard version that simply rewarded the number of problems solved students who played Brainpoints played longer, tried more strategies, and persisted longer on challenging problems. Perhaps even more important, more struggling students stayed in the game the full time. This study highlights the efficacy of incorporating growth-mindset principles into educational materials and practices.

Yet effectively implementing growth-mindset practices in educational contexts is not as straightforward as it might appear. Emerging research has revealed an unexpected paradox: Growing teacher awareness of growth-mindset does not map onto changes in students' mindsets. As the science of growth mindset has advanced, the concept has gained increasing popularity among parents and educators. Millions of people have read *Mindset* and watched Dr. Dweck's TED talks; parents and teachers converse about the benefits of growth mindset in discussion groups; and media coverage has burgeoned. It is easy to assume that teachers and parents who learn about growth mindset concepts will readily pass them on. However, this is not the case. Adults do not easily grasp the concept at a deep level, nor do they readily transmit it to children.

A growing number of studies support this conclusion. Research shows that many teachers and parents who endorse a growth mindset are not passing it on to children (Gunderson et al., 2013; Haimovitz & Dweck, 2016; Park et al., 2016; Sun, 2015; Yang Hooper et al., 2016). Indeed, the correlation between teachers' and parents' mindsets and those of their students and children is remarkably low. Thus an important direction of further research is to explore teachers' understanding, communication, and implementation of a growth mindset.

Dr. Dweck posits two hypotheses about this disconnect. One hypothesis is that it has become socially desirable in the United States at least, particularly for teachers, to endorse a growth mindset whether or not they understand it or deeply believe it. Our colleague Susan Mackie, who first observed this, termed it 'false growth mindset.'

A second hypothesis is that even if adults hold a deep and true growth mindset, they might not know how to pass it on. In other words, they could sincerely believe that children can develop their intelligence and sincerely wish to help them do so, but they may enact this in ways that fail to instill a growth mindset—or even in ways that unintentionally instill a fixed mindset.

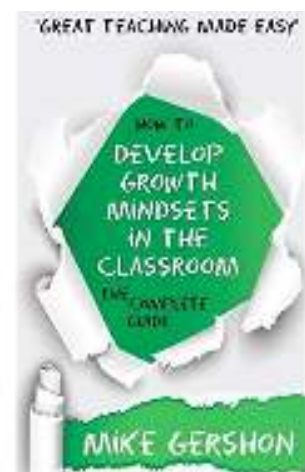
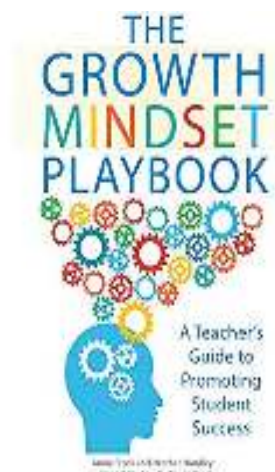
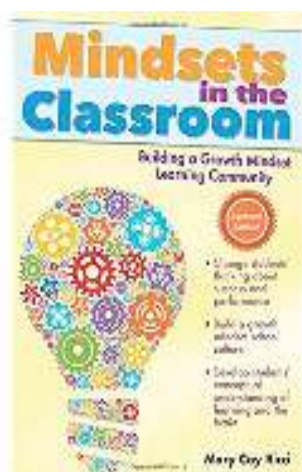
There is evidence for both hypotheses. Supporting the *false growth mindset* hypothesis, Rattan and colleagues (2012) showed that many Americans who endorsed a growth mindset on traditional measures did not endorse the idea that most children have the capacity to become highly intelligent adults. In a similar vein, Greene, Paunesku, and Dweck (in progress) find that many teachers endorse a growth mindset but do not endorse the idea that their low achievers could be 'turned around' and start achieving well. Thus, they may have either false growth mindsets or very limited growth mindsets, in which they believe that some children can get a lot smarter but others can only get a tiny bit smarter.

Evidence for the *failure of transmission* hypothesis comes from studies of how teachers and parents who endorse a growth mindset react to children's successes and failures in ways that

transmit a fixed mindset (Gunderson et al., 2013; Haimovitz & Dweck, 2016; Park et al., 2016; Sun, 2015; Yang Hooper et al., 2016). For example, despite scores of popular parent advice columns using our science to caution parents to praise their children's 'process' rather than 'ability' in order to promote a growth mindset, research shows that many parents who endorse a growth mindset do not use more process praise (Gunderson et al., 2013). Similarly, Haimovitz and Dweck (2016) recently showed that parents who react to their children's failures with learning-oriented feedback (rather than with anxiety or false reassurances) foster a growth mindset in their children. But, many parents who endorse a growth mindset still worried that their children would be harmed by failure and showed anxiety or rushed in with false reassurances instead of helping children learn from these challenges.

Studies of teachers, as well, show that the math teachers who work with their students in a learning-oriented manner when students are stuck have many more students in their classes who endorse a growth mindset (Sun, 2015; Yang Hooper et al., 2016). These practices involve sitting with struggling students, understanding their thought processes, and collaborating with them on generating new strategies to try. They also involve giving students chances to revise their work and to resubmit it in order to demonstrate their increased understanding of the underlying concepts. Many teachers who endorse a growth mindset do not engage in these practices (Sun 2015; Yang Hooper et al., 2016). It is, of course, possible that some adults participating in these studies had false growth mindsets, but, taken together, this research suggests that even the ones who had true growth mindsets might still have had erroneous theories about how to motivate children to grow their intelligence.

In ongoing research, Dr. Dweck and collaborators are working to create a professional development solution, one that will help ensure that students receive messages at school that support a growth mindset. This solution involves three interconnected components: (1) a *measure of educators' 'true' growth mindsets and practices*, which can be used for both scientific research and formative purposes in practice settings; (2) an *effective method of instilling a true growth mindset in the educators themselves*; and (3) a *comprehensive, step-by-step professional development curriculum that helps teachers learn and sustain growth mindset practices* in the classroom.



INFLUENCE

Dr. Dweck's work is enormously influential and this influence is growing in ways that will transform education for years to come. For instance:

- Working with the White House Office of Science and Technology Policy (OSTP) and the Department of Education, Dr. Dweck co-organized a convening in May 2013 of researchers, educators, and policymakers to discuss “Excellence in Education: The Importance of Academic Mindsets” at the White House (Shankar & Kalil, 2013).
- Government agencies and foundations are investing in research on academic mindsets. The National Science Foundation, the Spencer, W.T. Grant, Hewlett, Gates, Raikes, Joyce, and Lumina Foundations, and Character Lab have all sponsored research and/or White Papers in this area (e.g., Dweck et al., 2011; Farrington et al., 2012; Hewlett Foundation, 2012, 2013; Silva & White, 2013; Spencer Foundation, n.d., 2009, 2011). IES has also funded three Efficacy & Replication Awards on mindset interventions (PIs: Borman, Dee, and Walton). The Raikes Foundation has also supported a fellowship on noncognitive factors and learning at the US Department of Education's Office of Innovation and Improvement.
- Major interdisciplinary education networks are rapidly incorporating research on academic mindsets in their policies and recommendations, including the Strategic Education Research Partnership (SERP) and the Carnegie Foundation for the Advancement of Teaching, which emphasizes mindsets in its strategy to improve outcomes in developmental math in its network of community colleges (Bryk et al., 2011). Innovative charter networks (e.g., KIPP) and online providers like Khan Academy, Kaplan University, Florida Virtual School all incorporate mindset interventions in ongoing practice.
- Education scholars are increasingly incorporating mindset interventions in their work (e.g., in teacher training, Boaler, 2016; see also Karabenick & Urdan, 2014).
- Online courses that highlight academic mindsets have proven popular. Tens of thousands of teachers have taken courses created by Dr. Jo Boaler at Stanford's Graduate School of Education, which emphasize mindsets in math (<https://www.youcubed.org>). PERTS is disseminating free, high-quality mindset materials to significant interest. Mindset Kit materials (<http://www.mindsetkit.org/>) have been viewed by more than 150,000 users; mindset lesson plans distributed through Khan Academy have been downloaded more than 110,000 times; and mindset videos distributed through ClassDojo have been seen by more than 5 million students in 400,000 classrooms.

Quotes of Support from Respected Peers

Consider this reflection from Dr. Andy Elliott, Professor of Psychology at the University of Rochester, and one of the leading scholars of motivation in the world:

Dr. Carol Dweck has been a pioneer in the area of achievement motivation in education for the past 35 years. Her early work transformed the field by identifying and documenting the importance of two basic goals that students gravitate to in achievement settings: learning goals (trying to master tasks and improve) and performance goals (trying to demonstrate ability relative to others). From there she developed a broader social cognitive model centered on theories of intelligence, namely incremental (ability can change) and entity (ability is fixed) mindsets. This broader model has proven incredibly generative, both in terms of theory and application. I know of no other model of achievement motivation in the history of the field that has shown such promise to explain and predict behavior, and to guide pragmatic interventions in school settings, work settings, and beyond. Dr. Dweck's work has truly revolutionized the educational landscape.

Another from Dr. Claude Steele, Professor of Social Psychology at Stanford, and originator of the concept of "stereotype threat":

Dr Carol Dweck is simply among the 3 or 4 most important psychologists of this generation. This holds for both her basic science accomplishments and for her impact on society. As a scientist, she elucidated, more than anyone else, the psychological impact of the beliefs we hold about the nature of our abilities. For example, believing intellectual ability to be an incrementally expandable capacity as opposed to a fixed capacity has far reaching implications for human motivation, performance, the inclusion of women in STEM fields etc.--just to name a few implications. And perhaps more than any psychologist in decades, she has worked to transport these ideas to the public--where they would now have to be considered one of psychology's chief exports. These ideas have had a major impact in education, business, sports and athletic training, intergroup relations, etc. Dr. Dweck's body of work is a wonderful example of how science can move world cultures and societies forward. You simply could not find a more distinguished scientific accomplishment on which to bestow this distinguished award.

Epilogue

Test your own Mindset [here](#)!

An Example of [How To Weave Growth Mindset Into School Culture](#)