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Carol Dweck's Attitude

It's not about how smart you are

By David Glenn

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Carol S. Dweck says that her graduate students here at Stanford University are hard-working, creative, and resilient in the face of failure. But she wouldn't call them smart.

Over the last two decades, Dweck has become one of the country's best-known research psychologists by documenting the follies associated with thinking and talking about intelligence as a fixed trait.

Most famously, Dweck and her collaborators have demonstrated that praising children for their intelligence can backfire. When young people's sense of self-worth is bound up in the idea that they are smart—a quality they come to understand as a genetic blessing from the sky—at least three bad things can happen. Some students become lazy, figuring that their smarts will bail them out in a pinch. Others conclude that the people who praise their intelligence are simply wrong, and decide that it isn't worth investing effort in homework. Still others might care intensely about school but withdraw from difficult tasks or tie themselves in knots of perfectionism. (To understand this third group, think of the Puritans: They did not believe they had any control over whether they were among God's elect, but they nonetheless searched endlessly for ways to display that they had been chosen, and they were terrified of any evidence that they were not.)

It is much wiser, Dweck says, to praise children for work and persistence. People nearly always perform better if they focus on things they can control, such as their effort, rather than things they cannot.

At the age of 63, Dweck wears an expression of perpetual amusement. She is petite and dressed in black, and after six years at Stanford her general gestalt is still more New York than California. (She was raised in Brooklyn, and she taught at Columbia University for 15 years before coming here in 2004.) Among her many small

crusades is this one: She hates when people use "hard working" to signal faint praise in academic letters of recommendation.

"I'd like to change that culture," she says. "'Hard working' is what gets the job done. You just see that year after year. The students who thrive are not necessarily the ones who come in with the perfect scores. It's the ones who love what they're doing and go at it vigorously."

That's one tiny way in which Dweck's theories might change higher education. But she also has grander hopes. Colleges could improve their students' learning, she says, if they relentlessly encouraged them to think about their mental skills as malleable, rather than as properties fixed at birth. No more saying, "I can't major in chemistry because I'm just not wired for math."

Most of the evidence on this point comes from studies of younger students. Dweck herself spends a great deal of time these days acting as a consultant to public schools, especially middle schools. But she and others have also conducted several studies that suggest that college students, too, do better if they think of intelligence as flexible rather than frozen. In the next several years, Dweck hopes to develop a program that would train entering college students to adopt a "growth mindset," in regard to not only their intelligence but also their emotions.

The science here is not settled, however. Three recent studies have found that college students' beliefs about intelligence are not correlated with their academic performance—at least not in the straightforward way that Dweck's model proposes. The authors of those studies say they admire Dweck's work, but they are less hopeful than she is that college students' performance can be turned around with a simple intervention.

By her account, Dweck's own performance as a student was enthusiastic. When she arrived at Barnard College, she had a hard time settling on a major because she was enthralled by all of her courses.

"I loved everything," she says. "I loved sciences and I loved humanities. But ultimately I felt that in the humanities—you know, you're writing about things that already exist. But in the sciences you're discovering things that no one has known before. Ultimately I chose psychology because it seemed to combine science with things that I liked to think about. And I liked the idea that you could wonder about something, run an experiment, and have an answer a few months later."

What Dweck has wondered about for the last 40 years, more than any other single question, is how people cope with failure. In graduate school at Yale University, she became intrigued by Martin E.P. Seligman's model of "learned helplessness." In a famous series of experiments in the mid-1960s, Seligman and his colleague Steven F. Maier demonstrated that dogs that were subjected to random, uncontrollable electric shocks usually became helpless over time. That is, even if they were moved into an environment in which they could prevent the shocks by pressing a lever or doing some other trick, the dogs never learned to do so. The experience of random punishment had rendered these dogs passive, and immune to classical Pavlovian conditioning.

The Seligman experiments had a huge impact in psychology—but most of the early studies of learned helplessness in humans had to do with depression. Dweck went down a different road: She wondered if learned helplessness might interfere with students' academic performance.

To test that idea, Dweck asked a few dozen New Haven fifth graders to rearrange four colored blocks so that they matched the patterns shown on a set of cards. Such blocks are a staple of children's IQ tests, and they typically have two red sides, two white sides, and two sides that are diagonally split between red and white.

But in this case Dweck had rigged the game.

Each fifth grader was brought individually to a table with two amiable experimenters, whom we'll call Alice and Bob. The two experimenters alternated the presentation of the block problems according to a random sequence. For each of her problems, Alice gave the child a normal set of blocks. But Bob gave the child blocks with too many diagonally split sides—which meant that his problems were impossible to solve. Somewhat like the dogs in Seligman's experiments, Dweck's fifth graders were subjected to uncontrollable failure at random intervals.

Each child worked away at more than 30 of these problems—often solving Alice's, but never solving Bob's. The child had 20 seconds to do each problem, and he had some motivation to get them right. For each correctly solved problem, he was given a chip; with enough chips, he could choose from a pile of toys visible across the room.

At the end of the process came a twist. For the last two rounds, Bob quietly switched to a normal set of blocks and gave the child problems that he or she had successfully solved earlier in the experiment. (The patterns were rotated 90 degrees, so they may not

have been immediately familiar to the child.)

Some of the children failed to solve these problems—or took much longer than usual to get them right—even though they had solved them correctly just moments earlier. These children seemed to have consciously or unconsciously persuaded themselves (not without reason) that they could never solve Bob's problems. Like Seligman's helpless dogs, they did not seem to notice or take advantage of the fact that their environment had become controllable. But other children did fine, solving Bob's last two problems with no apparent trouble.

It turned out that the children's performance on those last two problems was strongly predicted by their answers on a psychological questionnaire that Dweck had given them beforehand. The questionnaire, known as the Intellectual Achievement Responsibility Scale, is designed to determine whether a person credits or blames his own behavior for his academic results, or whether he attributes those outcomes to external agents. ("The teacher had it in for me" versus "I didn't study hard enough." Or "the instructions weren't written clearly" versus "I didn't read the instructions carefully.")

The fifth graders whose answers had been at the individual-responsibility end of the scale tended to do well on Bob's last two questions. By contrast, those who said they credited or blamed others were the ones who behaved helplessly when Bob's questions suddenly became soluble.

The questionnaire, which was originally designed by other scholars in 1965, doesn't have right or wrong answers, exactly. Sometimes in life the teacher really does have it in for you; sometimes the instructions really aren't written clearly; sometimes the colored-block problems are rigged. But like many other psychologists, Dweck believes that on the whole, people do best if they believe in their own control over their behavior and their own responsibility for outcomes. Her colored-block experiment was significant because it demonstrated that children who attribute responsibility for their academic performance to others seem to be vulnerable to learned helplessness.

In the real world, outside of mildly sadistic experiments like Dweck's 1971 block study, how and why do some children acquire that kind of helplessness? In many cases, Dweck believes, it is because children grow up hearing parental chatter—"Smart girl!" and "You're so good at math!"—that conveys the idea that

intelligence is a fixed, innate quality, and therefore that they ultimately don't have much control over their academic successes and failures.

In a landmark series of studies with Claudia M. Mueller during the 1990s, Dweck demonstrated that praising children for their intelligence, rather than for their effort, often leads them to give up when they encounter setbacks. Such children tend to become preoccupied with how their performance compares with that of their peers, rather than with finding new strategies to improve their own work.

"In the nineties, the self-esteem gurus were telling parents and teachers to praise children as lavishly and globally as possible," Dweck says. "But from my research going back 20 years, I knew that it was the children who were overly concerned with their intelligence—who were even trafficking in that concept—who were the vulnerable ones." That element was something that Dweck began to explore in the years after her colored-block study; in a 1978 experiment with Carol I. Diener, Dweck found that children who described their own memory or intelligence in fixed ways were much more likely to give up on a difficult pattern-identification task than otherwise-similar children who did not make such statements.

Dweck and several colleagues believe that they have developed an effective system to help middle-school students avoid that morass and to think of their intelligence as "incremental" rather than fixed. Dozens of public-school systems have signed up to train their students using a program created by Dweck and Lisa Sorich Blackwell, her former student.

Could a similar intervention also work for college students? A few studies suggest that the answer is yes.

The most famous of those, as it happens, was done at Stanford a few years before Dweck's arrival. In the late 1990s, Joshua Aronson, who now teaches psychology at New York University, and two colleagues adopted Dweck's model by asking Stanford students to write letters to local middle-school "pen pals" that encouraged the younger students to persist in their studies. They were encouraged to tell the middle schoolers things like, "Humans are capable of learning and mastering new things at any time in their lives."

The point of this, of course, was to alter the Stanford students' beliefs about intelligence and learning, not the middle schoolers'. Relative to members of a control group, these Stanford students earned higher grades three months later, and were more likely to

report that they enjoyed academic work. The effects were especially strong among African-American students, who were overrepresented in the study.

But some other studies of college students have failed to support Dweck's model. In a 2003 study of 93 students at University College London, scholars did not find any relationship between students' academic performance and their beliefs about the nature of intelligence. A similar result has come out of research at Temple University, where two scholars are leading a large National Science Foundation-supported study of student performance in introductory biology and chemistry courses. In the first two semesters of that study, the scholars have found no connection between students' theories of intelligence and their grades.

"We wrote our research proposal thinking that this was a good, solid hypothesis," says Jennifer G. Cromley, an assistant professor of educational psychology at Temple. "So in some ways we're still grappling with these early results."

One potential factor is that Temple is a less-selective institution than the colleges where the best-known previous studies have taken place. So differences among the Temple students' beliefs about intelligence might be swamped, for example, by differences in their baseline knowledge about how to navigate through college life.

"We're doing long interviews that are trying to contextualize the students' experiences," says Cromley's research partner, Erin M. Horvat, an associate professor of urban education. "At Temple, you have kids who say, 'It takes me an hour and a half to get here.' 'I work until 4 a.m.' Those are things we have to keep in our consciousness. Not all of these students are being taken care of by their parents. Not all of them know to visit the professor during office hours. They don't all know how to manage the institutional culture."

A more fundamental challenge to Dweck's model came in a study published online last year in the journal *Self and Identity*. In laboratory experiments conducted at the University of Michigan at Ann Arbor, scholars found that students with "incremental" beliefs about intelligence do not always behave as optimally as Dweck and her colleagues suggest.

In the Michigan studies, college-age subjects were brought into a computer lab and told that they would take a difficult word-association test. (The test was in fact difficult: In one of the studies, the subjects got an average of 0.86 out of 10 questions

correct.) The studies wondered whether students' beliefs about intelligence ("entity" versus "incremental," in Dweck's terms) would affect how long they practiced before taking the test, whether they chose to listen to distracting music while practicing, and how they would explain their low scores after taking the test.

The answer turned out to be: It depends. The Michigan studies divided the incremental theorists (that is, the students who implicitly believed that intelligence is malleable) into two groups: Those whose sense of self-worth was tied to academic performance and those who didn't care so much about school. The latter group—those whose egos were not deeply invested in schoolwork—behaved as Dweck would have predicted. But among students whose self-worth was tied to academic performance, incremental theorists behaved similarly to students with "fixed" beliefs about intelligence. They avoided practicing, and they "self-handicapped."

For example, in one version of the study, the subjects were given either an easy or a difficult sample question from the test before they practiced. If they saw a difficult sample question, the incremental theorists who cared a lot about how they performed academically were more likely than any other group to choose distracting music when they practiced—presumably because they could later blame that distraction for their expected bad performance.

"In some cases, having an incremental theory might actually lead to dysfunctional behavior," says Jennifer Crocker, a professor of psychology at Michigan and an author of the study. "I think Carol is a great scientist, but in her writing you sometimes get the sense that having an incremental theory is a panacea, and it really doesn't seem to be."

Altering students' beliefs about the nature of intelligence may not help much, Crocker says, if they do not also reduce their general ego-investment in schooling. "A glib way of putting it is to say, 'Get over yourself,'" Crocker says. "If you want to stop acting in self-defeating ways, then think about how your schoolwork will help people outside of yourself."

Dweck says she agrees that holding an incremental theory of intelligence, in and of itself, doesn't cure all academic ills. "We now have a much fuller understanding of the mediators of this entire process"—that is, how beliefs about intelligence lead students to choose particular learning goals or to react emotionally to failures and setbacks. Each of those points along the chain, Dweck says, is

an opportunity for intervention.

"We can really focus on all of the nodes of the process," she says.

Dweck is now expanding her work on how beliefs about intelligence interact with anxieties about stereotypes among women and people of color. (To some degree, she is filling the shoes of Claude M. Steele, the theorist of "stereotype threat" who recently left Dweck's department to become provost of Columbia.) She and a colleague are studying how a "sense of belonging" contributes to students' willingness to persist in science majors at Stanford.

"We're about to embark on an intervention with Stanford freshmen where we teach them a growth mindset and how to put it into practice," she says. "We're going to try to include their implicit theories about emotion as well as intelligence. Because it's clear that if you have a fixed mindset and you're afraid that you might be failing, you're having all kinds of emotional reactions that could stand in your way."

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