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## The truth about grit

### Modern science builds the case for an old-fashioned virtue - and uncovers new secrets to success

By Jonah Lehrer | August 2, 2009

It's the single most famous story of scientific discovery: in 1666, Isaac Newton was walking in his garden outside Cambridge, England - he was avoiding the city because of the plague - when he saw an apple fall from a tree. The fruit fell straight to the earth, as if tugged by an invisible force. (Subsequent versions of the story had the apple hitting Newton on the head.) This mundane observation led Newton to devise the concept of universal gravitation, which explained everything from the falling apple to the orbit of the moon.

There is something appealing about such narratives. They reduce the scientific process to a sudden epiphany: There is no sweat or toil, just a new idea, produced by a genius. Everybody knows that things fall - it took Newton to explain why.

Unfortunately, the story of the apple is almost certainly false; Voltaire probably made it up. Even if Newton started thinking about gravity in 1666, it took him years of painstaking work before he understood it. He filled entire vellum notebooks with his scribbles and spent weeks recording the exact movements of a pendulum. (It made, on average, 1,512 ticks per hour.) The discovery of gravity, in other words, wasn't a flash of insight - it required decades of effort, which is one of the reasons Newton didn't publish his theory until 1687, in the "Principia."

Although biographers have long celebrated Newton's intellect - he also pioneered calculus - it's clear that his achievements aren't solely a byproduct of his piercing intelligence. Newton also had an astonishing ability to persist in the face of obstacles, to stick with the same stubborn mystery - why did the apple fall, but the moon remain in the sky? - until he found the answer.

In recent years, psychologists have come up with a term to describe this mental trait: grit. Although the idea itself isn't new - "Genius is 1 percent inspiration and 99 percent perspiration," Thomas Edison famously remarked - the researchers are quick to point out that grit isn't simply about the willingness to work hard. Instead, it's about setting a specific long-term goal and doing whatever it takes until the goal has been reached. It's always much easier to give up, but people with grit can keep going.

While stories of grit have long been associated with self-help manuals and life coaches - Samuel Smiles, the author of the influential Victorian text "Self-Help" preached the virtue of perseverance - these new scientific studies rely on new techniques for reliably measuring grit in individuals. As a result, they're able to compare the relative importance of grit, intelligence, and innate talent when it comes to determining lifetime achievement. Although this field of study is only a few years old, it's already made important progress toward identifying the mental traits that allow some people to accomplish their goals, while others struggle and quit. Grit, it turns out, is an essential (and often overlooked) component of success.

"I'd bet that there isn't a single highly successful person who hasn't depended on grit," says Angela Duckworth, a psychologist at the University of Pennsylvania who helped pioneer the study of grit. "Nobody is talented enough to not have to work hard, and that's what grit allows you to do."

The hope among scientists is that a better understanding of grit will allow educators to teach the skill in schools and lead to a generation of grittier children. Parents, of course, have a big role to play as well, since there's evidence that even offhand comments - such as how a child is praised - can significantly influence the manner in which kids respond to challenges. And it's not just educators and parents who are interested in grit: the United States Army has supported much of the research, as it searches for new methods of identifying who is best suited for the stress of the battlefield.

The new focus on grit is part of a larger scientific attempt to study the personality traits that best predict achievement in the real world. While researchers have long focused on measurements of intelligence, such as the IQ test, as the crucial marker of future success, these scientists point out that most of the variation in individual achievement - what makes one person successful, while another might struggle - has nothing to do with being smart. Instead, it largely depends on personality traits such as grit and conscientiousness. It's not that intelligence isn't really important - Newton was clearly a genius - but that having a high IQ is not nearly enough.

Consider, for instance, a recent study led by Duckworth that measured the grittiness of cadets at West Point, the elite military academy. Although West Point is highly selective, approximately 5 percent of cadets drop out after the first summer of training, which is known as "Beast Barracks." The Army has long searched for the variables that best predict whether or not cadets will graduate, using everything from SAT scores to physical fitness. But none of those variables were particularly useful. In fact, it wasn't until Duckworth tested the cadets of the 2008 West Point class using a questionnaire - the test consists of statements such as "Setbacks don't discourage me" - that the Army found a measurement that actually worked. Duckworth has since repeated the survey with subsequent West Point classes, and the result is always the same : the cadets that remain are those with grit.

In 1869, Francis Galton published "Hereditary Genius," his landmark investigation into the factors underlying achievement. Galton's method was straightforward: he gathered as much information as possible on dozens of men with "very high reputations," including poets, politicians, and scientists. That's when Galton noticed something rather surprising: success wasn't simply a matter of intelligence or talent. Instead, Galton concluded that eminent achievement was only possible when "ability combined with zeal and the capacity for hard labour."

Lewis Terman, the inventor of the Stanford-Binet IQ test, came to a similar conclusion. He spent decades following a large sample of "gifted" students, searching for evidence that his measurement of intelligence was linked to real world success. While the most accomplished men did have slightly higher scores, Terman also found that other traits, such as "perseverance," were much more pertinent. Terman concluded that one of the most fundamental tasks of modern psychology was to figure out why intelligence is not a more important part of achievement: "Why this is so, and what circumstances affect the fruition of human talent, are questions of such transcendent importance that they should be investigated by every method that promises the slightest reduction of our present ignorance."

Unfortunately, in the decades following Terman's declaration, little progress was made on the subject. Because intelligence was so easy to measure - the IQ test could be given to schoolchildren, and often took less than an hour - it continued to dominate research on individual achievement.

The end result, says James J. Heckman, a Nobel Prize-winning economist at the University of Chicago, is that "there was a generation of social scientists who focused almost exclusively on trying to raise IQ and academic test scores. The assumption was that intelligence is what mattered and what could be measured, and so everything else, all these non-cognitive traits like grit and self-control, shouldn't be bothered with."

One of the main obstacles for scientists trying to document the influence of personality traits on achievement was that the standard definition of traits - attributes such as conscientiousness and extroversion - was rather vague. Duckworth began wondering if more narrowly defined traits might prove to be more predictive. She began by focusing on aspects of conscientiousness that have to do with "long-term stamina," such as maintaining a consistent set of interests, and downplayed aspects of the trait related to short-term self-control, such as staying on a diet. In other words, a gritty person might occasionally eat too much chocolate cake, but they won't change careers every year. "Grit is very much about the big picture," Duckworth says. "It's about picking a specific goal off in the distant future and not swerving from it."

After developing a survey to measure this narrowly defined trait - you can take the survey at [www.gritstudy.com](http://www.gritstudy.com) - Duckworth set out to test the relevance of grit. The initial evidence suggests that measurements of grit can often be just as predictive of success, if not more, than measurements of intelligence. For instance, in a 2007 study of 175 finalists in the Scripps National Spelling Bee, Duckworth found that her simple grit survey was better at predicting whether or not a child would make the final round than an IQ score.

But grit isn't just about stubborn perseverance - it's also about finding a goal that can sustain our interest for years at a time. Consider two children learning to play the piano, each with the same level of raw talent and each expending the same effort toward musical training. However, while one child focuses on the piano, the other child experiments with the saxophone and cello. "The kid who sticks with one instrument is demonstrating grit," Duckworth says. "Maybe it's more fun to try something new, but high levels of achievement require a certain single-mindedness."

Duckworth has recently begun analyzing student resumes submitted during the college application process, as she attempts to measure grit based on the diversity of listed interests. While parents and teachers have long emphasized the importance of being well-rounded - this is why most colleges require students to take courses in all the major disciplines, from history to math - success in the real world may depend more on the development of narrow passions.

"I first got interested in grit after watching how my friends fared after college," Duckworth says. She noticed that the most successful people in her Harvard class chose a goal and stuck with it, while others just flitted from pursuit to pursuit. "Those who were less successful were often just as smart and talented," Duckworth notes, "but they were constantly changing plans and trying something new. They never stuck with anything long enough to get really good at it."

In recent decades, the American educational system has had a single-minded focus on raising student test scores on everything from the IQ to the MCAS. The problem with this approach, researchers say, is that these academic scores are often of limited real world relevance. However, the newfound importance of personality traits such as grit raises an obvious question: Can grit be learned?

While Duckworth and others are quick to point out that there is no secret recipe for increasing grit - "We've only started to study this, so it's too soon to begin planning interventions," she cautions - there's a growing consensus on what successful interventions might look like.

One of the most important elements is teaching kids that talent takes time to develop, and requires continuous effort. Carol S. Dweck, a psychologist at Stanford University, refers to this as a "growth mindset." She compares this view with the "fixed mindset," the belief that achievement results from abilities we are born with. "A child with the fixed mindset is much more likely to give up when they encounter a challenging obstacle, like algebra, since they assume that they're just not up to the task," says Dweck.

In a recent paper, Dweck and colleagues demonstrated that teaching at-risk seventh-graders about the growth mindset - this included lessons about the importance of effort - led to significantly improved grades for the rest of middle school.

Interestingly, it also appears that praising children for their intelligence can make them less likely to persist in the face of challenges, a crucial element of grit. For much of the last decade, Dweck and her colleagues have tracked hundreds of fifth-graders in 12 different New York City schools. The children were randomly assigned to two groups, both of which took an age-appropriate version of the IQ test. After taking the test, one group was praised for their intelligence - "You must be smart at this," the researcher said - while the other group was praised for their effort and told they "must have worked really hard."

Dweck then gave the same fifth-graders another test. This test was designed to be extremely difficult - it was an intelligence test for eighth-graders - but Dweck wanted to see how they would respond to the challenge. The students who were initially praised for their effort worked hard at figuring out the puzzles. Kids praised for their smarts, on the other hand, quickly became discouraged.

The final round of intelligence tests was the same difficulty level as the initial test. The students who had been praised for their effort raised their score, on average, by 30 percent. This result was even more impressive when compared to the students who had been praised for their intelligence: their scores on the final test dropped by nearly 20 percent. A big part of success, Dweck says, stems from our beliefs about what leads to success.

Woody Allen once remarked that "Eighty percent of success is showing up." Duckworth points out that it's not enough to just show up; one must show up again and again and again. Sometimes it isn't easy or fun to keep

showing up. Success, however, requires nothing less. That's why it takes grit.

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