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The Choice to Make a Difference

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Making a difference is a choice. Some people make that choice earlier, some later, and some not at all. I was a late bloomer. This article charts my evolution—from a researcher doing basic research with little thought of direct application to a researcher and writer with a mission to use what I learn for the benefit of individuals and, I hope, of society itself.

Recently, I had the honor of meeting a political and social organizer who had made a real difference in the world. From his early youth, this man had dedicated his life to promoting and protecting human rights. I had not been like him. We both came of age in the 1960s, a time of tremendous ferment and political action, but he was an active participant and I was a well-wisher. Back then, I was a long way from thinking of myself as someone who had a contribution to make and as someone whose life would be dedicated to that mission.

As a graduate student and young professor, I thought of myself as a researcher who was studying things that were relevant to people's lives. But I hoped that *other* people—the people who worked in the real world—would read my research, find it relevant, and apply it. After all, I was a "basic" researcher. Then one day in the late 1990s, Betty Hamburg, then the president of the William T. Grant Foundation, took me to lunch. The purpose of the lunch was to inform me that I was going into the real world. "It's time," she said. I obeyed and I never looked back.

The Research: The Path to Real-World Interventions

Since the 1980s, my research has examined the beliefs people hold—their mindsets—and how these beliefs can affect their motivation, achievement, and well-being. The mindset my students and I have studied most involves beliefs about intelligence: the belief that intelligence is fixed and unchangeable (a fixed mindset) versus the belief that intelligence can be developed, for example, through effort, good strategies, and input and mentoring from others (a growth mindset). Research has shown that which belief students favor can make a difference. A growth mindset can lead students to take on more challenges (e.g., Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999) or persist more in the face of setbacks (e.g., Nussbaum & Dweck, 2008; see also Moser, Schroder, Heeter, Moran, & Lee, 2011), and can, for some students, affect their level of achievement (e.g., as indexed by grades, test scores, or school persistence; e.g., Blackwell, Trzesniewski, & Dweck, 2007).

Starting in the early 2000s and building on the foundation of our prior studies, researchers began to develop mindset "interventions" to address underachievement in the real world. They crafted in-person programs designed to teach students a growth mindset and how to apply it to their schoolwork. The first interventions were created by Aronson, Fried, and Good (2002) and Good, Aronson, and Inzlicht (2003), followed by Blackwell et al. (2007), and used powerful metaphors and engaging exercises to teach students how the brain changes with learning and how intellectual abilities can be developed. Together, these studies demonstrated that a growth mindset could be taught and could have relatively enduring effects, such that the interventions influenced later grades (Aronson et al., 2002; Blackwell et al., 2007) and achievement test scores (Good et al., 2003).

However, there were challenges to implementing these interventions on a larger scale. They were in-person, multisession workshops that would be expensive and time-consuming to recreate with large numbers of students. For example, the Blackwell et al. (2007) study involved a number of highly trained personnel delivering eight separate sessions, one per week, to seventh graders. Not only was further implementation limited, but given this resource constraint, further research was also limited. How could researchers achieve the sample sizes necessary to understand when,

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where, and for whom these interventions did or did not work well?

A solution to this problem appeared on the horizon in 2010 when Dave Paunesku, David Yeager, and Carissa Romero explored the possibility of creating (a) interventions that could be self-administered by students and (b) an online platform that could be used to deliver the programs directly to the students (see http://www.perts.net). Since then, many thousands of adolescents have received growth-mindset programs that distill the message and the exercises into one or two sessions. Of course, we realized that this mode of delivery and the greatly shortened programs would have drawbacks. We simply could not hope to get the effect sizes that were obtained by the longer, in-person programs delivered by trained personnel who could work closely with students. However, there were clear advantages. We could begin to understand who benefited most from growth-mindset interventions and on which outcomes. For example, we have now found in a preregistered study (Yeager, Romero, et al., 2016) that in terms of grades or school persistence, lower achieving students or students at risk for low achievement are the ones who benefited, but in terms of promoting challenge seeking, both high- and low-achieving students benefited (see also Paunesku et al., 2015). And we could reach large numbers of students at a very low cost.

Moreover, the brevity and simplicity of these programs allowed our results to be readily replicated by others. And they have been. For example, economists working with the World Bank in Peru administered our materials to more than 50,000 students with benefits for achievement test scores across subject areas (World Bank, 2017; for a replication by economists working in Norway, see Bettinger, Ludvigsen, Rege, Solli, & Yeager, 2018).

Yet we still knew little about the school environments that would help students' newly learned growth mindsets take root or would prevent them from doing so. For example, would it require a supportive peer culture—a school in which there was a student norm of challenge-seeking and effort—to help a fledgling growth mindset flourish? There is one best way to answer such questions: with a nationally representative sample of schools and students. So, my colleague David Yeager spearheaded a large, preregistered, randomized controlled study with a nation-wide, representative sample of more than 14,000 students who were making the transition to high school (called the *National Study of Learning Mindsets*). Academic performance during this transitional year is a strong predictor of future academic and economic trajectories. The results from this intervention study (Yeager et al., 2018) will be available shortly and will shed light on the factors that affect the success of our intervention, both in terms of students' grades and in terms of their choice to pursue future challenges, such as advanced math.

As these intelligence-mindset interventions flourished, researchers began asking what other mindsets might make a difference. Working with mindsets about *personality* (beliefs about whether one's personal qualities are fixed or can be developed), researchers have examined their implications for mental health. They have now shown that a fixed mindset can contribute to anxiety in adolescence (Yeager, Lee, & Jamieson, 2016) and that a growth mindset intervention can help alleviate anxiety and depression (Schleider & Weisz, 2016) or help reduce the onset of depression (Miu & Yeager, 2015) among adolescents (see also Yeager, Trzesniewski, & Dweck, 2012). Working with mindsets about *groups*, we have examined the impact of a mindset intervention on the intergroup attitudes of parties involved in long-standing conflicts, such as the Middle East conflict (Goldenberg et al., 2017; see also Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011). These are just some of the exciting directions that mindset interventions have taken.

Public Outreach

In all of the examples so far, the research itself reached into the real world to address social problems, such as academic risk or mental health—and, in the future, after rigorous testing, these programs will be available to educators at no cost. But I have also sought other ways to disseminate our findings to the public.

In the early 2000s, my graduate students started encouraging me to write a book. They told me that they (and their friends and families) had used our findings to embolden themselves when they faced challenges and to repair themselves when they experienced disappointments or setbacks. Now they wanted the world at large to benefit from our theory and findings. I wavered for a while—at the time, very few psychologists had written this kind of book—but I knew they were right. With the book *Mindset*, which was published in 2006 (Dweck, 2006), I took the next step in the choice to make a difference.

Writing this book and hearing so many people's reactions to it—to the idea that human potential could be developed—further crystalized my life's mission. The message was not that all human attributes could or should be changed, or that anyone could necessarily be or do anything. The message was about the benefits of understanding that we are all capable of meaningful growth, that people can further develop their abilities through sustained effort, good strategies, and lots of input and guidance from others.

Of course, it is not possible to rigorously evaluate the effects of a book, so here are just a few observations and examples. Every day I receive moving letters from people (sometimes as young as 12 years old) who have read *Mindset* and used the principles to make real changes in their lives—often changes they did not know were possible. Growth-mindset philosophies and practices have been widely adopted in education and parenting to foster challenge seeking and resilience (see, e.g., Khan Academy, 2018). Growth-mindset approaches have also been used by businesses to enhance both innovation and personal development in their cultures. For example, Microsoft CEO Satya Nadela has used growth mindset as a pillar of his highly successful reorganization and revitalization of Microsoft (Nadela, 2017; for how Microsoft used growth-mindset-based programs to nurture leadership potential throughout the company, see Dweck & Hogan, 2016). Sports coaches, such as Brad Stevens of the Boston Celtics, as well as coaches in youth sports organizations, have implemented mindset practices to motivate their players and coalesce their teams around growth. And growth mindsets have found their way into government policies and programs. Not long ago, I met with an official of a country that had recently fought for its independence. He was implementing growth-mindset-inspired practices to energize the stagnant government bureaucracy in order to help preserve the country's fragile democracy. Others have used growth mind-set principles to help modernize their country's economy.

Although all of this has been deeply gratifying, it has highlighted the fact that we need much new research to find out how to put theory into practice more systematically and effectively. Toward this end, colleagues have launched programs of research on the instructional practices that successfully foster a growth mindset and its benefits in educational settings (e.g., Canning, Muenks, Green, & Murphy, 2018; Muenks, Canning, Green, & Murphy, 2018), with much more to come in intergroup and organizational settings as well.

Challenges

All research involves struggle and challenges, and when you take your research and its implications into the real world, the challenges multiply. Here are just three of them. First, the National Study of Learning Mindsets, initiated and led by David Yeager, was the largest study our group ever did. Sometimes we thought it was too big, maybe even foolhardy. So, to get it right, we did years of work to carefully develop and pilot test the new intervention for this study and to design the study in ways that met the rigorous standards of our science in the modern era (for a description of the development process, see Yeager, Romero, et al., 2016). We undertook this project to learn new things; to test a highly scalable intervention; and to show that a study with a large, nationally representative sample and a randomized controlled design—with preregistered hypotheses and analyses—was feasible in our area of research (Yeager et al., 2018). We are grateful to the field of replication science for inspiring us to reach for the highest standards of field experimentation.

Another important challenge has resulted from a misunderstanding in the field about what counts as a noteworthy effect size for real-world outcomes, such as grades and test scores. In psychology, we are familiar with Cohen's (1988) guidelines, perhaps appropriate for lab studies, in which a large effect size is .80. In education, many are familiar with John Hattie's guidelines (Hattie, Biggs, & Purdie, 1996), based on his meta-analyses, which suggest that .57 is a large effect size. But, by design, Hattie included all kinds of studies (such as laboratory studies, studies with small samples, short lags between training and testing, and testing on much the same thing that was taught) that make his figure an inappropriate comparison for more rigorous, large-sample field studies with important real-world outcomes, such as grades, course taking, school persistence, or standardized test scores. Instead, experts in educational evaluation understand that .20 is about the *best* that can be expected from educational interventions, even from comprehensive and expensive ones (e.g., Dynarski, 2017). Smaller class sizes (Nye, Hedges, & Konstantopoulos, 2000), a year with a good teacher (Hanushek, 2011), and a whole year of schooling from the 9th through the 10th grade (about the age of most of our online interventions; Lipsey et al., 2012) all yield an effect size of about .20. The original, in-person growth-mindset interventions yielded effects of this size, and our self-administered online programs (which last under an hour) yield about half of that effect for students at risk for lower achievement, although the World Bank study in Peru using our materials reported an effect size of .20 (at a cost of about 20 cents per student; World Bank, 2017). It is pretty good to get a nice chunk of what is possible for so little time and cost.

The third, and quite unexpected, challenge came from practitioners' misinterpretations of growth mindset and how to foster it. For example, in the name of a growth mindset, many educators simply exhorted kids to try hard (an age-old ineffective practice), some told kids they can do anything (without further guidance in how this could be achieved), and some put a mindset chart in front of the classroom or gave a lecture on growth mindset, but did not change classroom practices to support a growth mindset. When this "false growth mindset" came to light, I immediately sent out the

warning in educational outlets (e.g., EdWeek: Dweck, 2015), I revised *Mindset*, and researchers Stephanie Fryberg and Mary Murphy undertook the creation of a detailed curriculum for teachers, one that will guide teachers in their understanding of a growth mindset and its implementation in their classrooms. This curriculum will be available at no cost when it is completed and evaluated.

The challenges we faced have taught us a great deal about mindset theory and its applications in the real world. They have made us better scientists, better communicators of our science, and better resources for real-world practitioners.

Conclusion

My work has changed me from an observer of the world to an active participant in it, because understanding how to foster human potential became my life's work. I have seen where growth and opportunity have taken me and I wish that for everyone.

Some have expressed dissatisfaction with the state of psychology, but let's use that dissatisfaction to build something better, sounder, more effective, more important. So many social issues, from conflict to job-readiness to health, have important psychological bases, and we have the theories and research skills to address them (Walton & Dweck, 2009). Can the world depend on us to do cumulative, meaningful work that contributes to the solution of its problems and to the well-being of humanity? Is there a more important use for our expertise right now?

Action Editor

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The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

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