

## CHAPTER 18

# Mindsets Change the Imagined and Actual Future

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People's beliefs are a fundamental part of their personality and motivation, although this is often unrecognized. People's foundational beliefs about themselves, others, and the world can powerfully shape their goals, the vigor and effectiveness of their goal pursuit, their recurrent patterns of behavior, and, in the end, their well-being. In this chapter, we spotlight beliefs about the self and others, particularly people's implicit theories or mindsets about human attributes (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Dweck & Leggett, 1988; Schleider, Abel, & Weisz, 2015; Yeager & Dweck, 2012). Focusing on the areas of intellectual achievement and social relations, we demonstrate the impact of conceiving of human attributes as fixed traits, as opposed to malleable qualities that can be developed. And we show how the impact of these beliefs stems, in large part, from the way they lead people to think about the future.

Our basic thesis is that believing in fixed traits (holding an *entity theory* or a *fixed mindset*) means that the judgments you make about yourself and others can potentially be lasting judgments. That is, the way people are now, in terms of their basic qualities, may well be the way they will always be. Needless to say, this can have strong repercussions for people's concerns in the present and their hopes and fears about the future.

In contrast, believing that basic qualities can be developed (holding an *incremental theory* or a *growth mindset*) means that any current judgments you make about yourself and others are subject to revision in the future. If people have the potential to learn and change, you have to be open to that possibility and even work toward it going forward—toward that more promising future.

The plan of the chapter is as follows. Using research on mindsets about intelligence and personality, we show that:

- The two mindsets orient people toward different goals: *performance goals* that are typically about validating the self right now versus *learning goals* that have a time dimension and are about mastering new challenges and improving the self.
- The two mindsets lend different meanings to difficulty, setbacks, and even effort: In one mindset they are measures of fixed qualities; in the other they are a natural part of learning and carry valuable information about how to move forward more successfully.
- Existing individual differences in mindsets can predict important intellectual and social outcomes over time.
- Interventions to promote a growth mindset about intelligence or personality, by focusing people away from permanent judgments and toward the potential for change in the future, can bring about changes in motivation, behavior, and outcomes, including increases in academic performance and reductions in aggression, stress, or the onset of depression.

We conclude by noting the implications of this research for the design of learning and working environments that are cultures of development rather than cultures of judgment—cultures in which people can focus on larger, longer term contributions instead of small, immediate, safe successes. We also pinpoint implications for psychological interventions in general, suggesting that successful psychological interventions are often ones that give people new beliefs, motivations, or self-regulatory skills that allow them to look beyond a problematic present and think constructively about (as well as work toward) a better future.

### WHAT ARE THE FIXED AND GROWTH MINDSETS?

Do people believe that their intelligence (or their personality) is a fixed trait, or do they believe it is a quality that can be cultivated through learning and experience?

For intelligence, we find this out by asking people to agree or disagree with a series of statements, such as: “Your intelligence is something basic about you that you can’t really change” or “No matter who you are, you can substantially change your level of intelligence” (Dweck, 1999; Dweck, Chiu, & Hong, 1995). If people tend to agree more with statements like the first one, they are endorsing a *fixed mindset*, that is, the idea that intelligence is a fixed entity. In contrast, if they tend to agree more with statements like the second, they are reflecting a *growth mindset*, that is, the idea that intellectual ability can be increased through learning. Analogously, to measure a fixed mindset of personality, people tell us how much they agree or disagree with statements such as: “The kind of person someone is is something very basic about them and it can’t be changed very much” (Chiu, Hong, & Dweck, 1997; Dweck, 1999).

Can people hold different mindsets in different areas? Most definitely. Mindsets about intelligence reliably load on a different factor than mindsets about personality or moral character (Dweck et al., 1995). Intelligence mindsets correlate with personality mindsets at approximately  $r = .30$ —conceptually meaningful, but clearly not the same construct (Dweck et al., 1995). Recently, Schroder, Dawood,

Yalch, Donnellan, and Moser (2016) measured mindsets in many domains in a large sample of college students. They, too, found evidence for some shared variance across the different mindsets but also a great deal of domain-specificity, with the more domain-specific measures typically being the better predictors of outcomes of interest within that domain.

Furthermore, even within one domain, such as intellectual ability, people can believe that their language ability can be developed but that their math ability is fixed, or vice versa. (Note that holding a fixed mindset is quite different from having high or low confidence in your ability; you can believe that your ability is fixed at a high level or a low level; Dweck & Leggett, 1988).

There is something else we have come to appreciate over time. Even within an area, these mindsets can be quite dynamic, even when there is significant stability in the dominant mindset over time. Someone can hold a growth mindset much of the time, but certain events, such as highly challenging tasks, important setbacks, or harsh criticism, can push them into a fixed mindset—that is, can lead them, at least temporarily, to feel that their fundamental abilities are fixed and are now in question. If, on the other hand, they are able to remain in a growth mindset, they can still question their level of current ability but then ask what they need to do to develop it further.

Nonetheless, people's endorsement of the mindset statements, such as those presented above, usually give us a good idea of where they stand on the mindset continuum. The one exception is among people who have become familiar with the mindset concept, as has happened with many educators. In these cases, people may come to believe that agreement with the growth mindset item is the preferable answer, and so their survey responses become less predictive of their behaviors (Hooper, Yeager, Haimovitz, Wright, & Murphy, 2016). We are now working to address this by developing new, less direct measures.

However, mindsets are not simply an individual-difference variable. They are beliefs that can be primed or induced. They can be induced, for example, by telling people that the task they are about to perform either is a measure of a fixed ability or involves a skill that can be learned through practice (e.g., Martocchio, 1994). They can be induced by giving people persuasive articles to read that convey intelligence as either something inherent and unchangeable or something that can be increased through hard work, good strategies, and mentoring from others (e.g., Hong, Chiu, Dweck, Lin, & Wan, 1999; Nussbaum & Dweck, 2008). They can also be taught in more long-term ways by means of mindset interventions, that is, workshops that teach a growth mindset, its different ramifications, and how to apply it to the relevant situations, be they academic (e.g., Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003; Paunesku et al., 2015; Yeager, Romero, et al., 2016), social (Yeager et al., 2014; Yeager, Miu, Powers, & Dweck, 2013; Yeager, Trzesniewski, & Dweck, 2013), work-related (Heslin, Latham, & VandeWalle, 2005), or health-related (Burnette & Finkel, 2012; Burnette et al., 2013).

## **MINDSETS CREATE DIFFERENT PSYCHOLOGIES**

A view of the future is inherent in the definition of the mindsets. People in a fixed mindset may expect that current traits, performance, or behaviors will simply

persist into the future, whereas people in a growth mindset believe that people have the potential to develop their attributes over time and become different in the future (Chiu et al., 1997; Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011).

In this section, we convey how the mindsets, each with their different views of the present and future, set up different “meaning systems”—psychological frameworks in which the same things have different values and different meanings (Hong et al., 1999; Molden & Dweck, 2006). It is through these meaning systems that people with similar skills end up exposing themselves to different experiences, reacting to similar experiences in different ways, and achieving different levels of academic and social success, as well as different levels of well-being.

### **Goals: What Do People Want?**

Freud famously asked, “What do women want?” (Jones, 1955). Here we ask, “What do people want?” and we show that what people want for themselves—their goals—can be meaningfully affected by their mindsets. This makes sense. If you believe that your intelligence is simply fixed, then you want to show it in a favorable light. You want to embark on tasks that ensure success, and you want to avoid tasks that pose a risk of struggle, mistakes, or failure. This means that when you think about the future, you have to carefully think of all the little and big land mines you have to avoid.

However, if you believe that your intelligence is something you can develop, you can worry less about how you fare on any given task in the short run and instead orient more toward developing your abilities over time. In other words, you can be more oriented toward growing into the person you would like to become in the future.

#### Intelligence Mindsets and Intellectual Goals

Blackwell and colleagues (2007) conducted a longitudinal study of adolescents making the difficult transition to seventh grade, a perfect time to examine the impact of mindsets. At the beginning of this transitional year, they measured students’ intelligence mindsets and their achievement goals (among other things) and then monitored their grades in math over the next 2 years. Students with more of a growth mindset, compared with those with more of a fixed mindset, were significantly more oriented toward learning goals—goals that favor longer-term learning over shorter-term performance. Specifically, they more strongly endorsed statements such as “I like schoolwork that I’ll learn from even if I make a lot of mistakes.” We return to this study below.

In a related vein, Robins and Pals (2002) conducted a longitudinal study of college students, measuring their intelligence mindsets (among other things) and tracking their self-esteem across the last 3 years of college. Consistent with the findings from Blackwell et al. (2007), students with growth mindsets were more focused on learning goals (“The knowledge I gain in school is more important than the grades I receive”), whereas those with fixed mindsets were more focused on performance goals, worrying more about their grades and how they reflected on their ability. It is not that students in a growth mindset don’t care about grades; they may simply care more about the learning (cf. Grant & Dweck, 2003).

Research by Cury, Elliot, Da Fonseca, and Moller (2006) lends further support and then goes on to demonstrate the direct, causal effect of mindsets. In a first study, Cury et al. (2006) found that students' growth versus fixed mindsets of intelligence predicted adolescents' learning versus performance goals, which accounted for their higher versus lower math grades. In a second study, they showed that orienting adolescents toward a growth (vs. fixed) mindset of intelligence before taking an intelligence test led to higher scores on the test by influencing their achievement goals.

Finally, Hong et al. (1999) caught entering college students at a pivotal moment in their academic careers. These students were enrolling at the University of Hong Kong, an elite school in which all of the classes were conducted in English. Unfortunately, not all of the entering students were proficient in English. On registration day, Hong and colleagues (1999) asked these freshman how likely they would be to take a remedial English course if the faculty offered it. Among the students who were not proficient in English, those who held a growth mindset of intelligence replied with a resounding yes—they wanted to learn—but the nonproficient students with a fixed mindset of intelligence were not as enthusiastic. It was as though they preferred to hide their deficiency rather than expose it, even if the deficiency put their future college career in jeopardy.

Importantly, these goals do not just operate when we are faced with a choice of tasks. They can affect our moment-to-moment decisions as we perform a task. Ehrlinger, Mitchum, and Dweck (2016) found that, as people worked on a task, those with more of a fixed mindset deployed their attention toward the easier problems rather than the harder ones. As a result, they ended up with distorted, overly high, views of their abilities on the task—views that suited their immediate need to feel intelligent. Those with a growth mindset deployed their attention to hard problems as well as easy ones, thus gaining a more realistic view of their abilities—a view that suited their longer-term learning goals. That is, an accurate view of their current knowledge and skills could direct their future learning more effectively.

Nussbaum and Dweck (2008) provide another example of people shoring up their current sense of their intelligence at the expense of learning. They oriented college students toward either a fixed or a growth mindset by having them read an article that espoused one view of intelligence or the other. Then, after a very difficult task on which students did poorly, they were given a choice. They could look at the strategies of students who had done better than they had (and learn from them) the strategies of students who had done even worse than they had (and feel better about their abilities). Compared with those in a growth mindset, those in a fixed mindset indeed looked more at the strategies of students who had done even worse than they had—and in fact felt better about themselves as a result.

An important question arises: If those with a fixed mindset believe that ability is unchangeable, why do they have to keep validating it over and over? For example, if they have already proven that they are smart, why can't they ride off into the sunset and take on new challenges? The answer seems to be that every new task or new course represents a new measure of their intelligence. Maybe they were smart enough for algebra but not for calculus; maybe they were smart enough for high school chemistry but not college chemistry; maybe they were smart in their former school but not in this new, more selective school. In other words, maybe their fixed intelligence was ample for past, easier tasks but not for harder ones. This is what

keeps people with a fixed mindset focused on tasks that will yield positive judgments in the here and now and not necessarily on the tasks that will best equip them with the skills they need in the future.

### Personality Mindsets and Social Goals

In a similar fashion, people's mindsets about their socially relevant personality traits can shape the goals they have for their social lives. When people hold more of a fixed mindset of personality, they tend to focus on validating their positive social traits and on avoiding situations in which they might be "outed" as socially deficient in some way. Although, of course, people don't want to humiliate themselves, an overly strong focus on these goals can keep them from situations in which they could grow and develop their social skills.

For instance, Erdley, Loomis, Cain, and Dumas-Hines (1997, Study 2) measured fourth-, fifth-, and sixth-grade children's personality mindsets. Then they assessed the goals that the children would pursue in difficult social situations, such as deciding who to invite to a birthday party. Children with more of a fixed mindset of personality endorsed more performance-oriented goals—goals that ensured success (such as inviting people you were sure would say yes) but that provided little opportunity to expand their social network or practice new social skills. Using similar measures to the Erdley et al. (1997) research, Rudolph (2010) found that children with a fixed mindset were more likely to report performance versus learning goals in a social setting. They focused more on judgments from peers and less on growing or developing their relationships with peers.

Beer (2002) extended these ideas to a specific personality trait: shyness. In a series of studies she showed that shy people vary in the extent to which they endorse fixed mindset statements such as "My shyness is something about me that I can't change very much." She then assessed shy people's goals in a novel social situation that involved getting to know a stranger during a 5-minute social interaction. First, shy people with a fixed mindset were less likely to adopt learning goals for the upcoming interaction. That is, they were less likely to opt for an interaction in which they would "learn some social skills applicable beyond the laboratory setting" but risked appearing awkward on the videotape of the interaction. Next, shy individuals with more of a fixed mindset of shyness reported using more avoidant strategies (avoiding eye contact, or asking questions to turn attention away from themselves), and coding of their interactions showed that they in fact used these avoidant strategies more frequently. In the end, their interactions with a new person were rated as less successful.

More recent studies extended these findings to the goals people adopt when they are pursuing clinical treatments. One study (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015) found that those with more of a fixed mindset of anxiety said that, if they struggled with mental health problems, they would choose medication as a treatment, rather than therapy or therapy plus medication. Therapy might seek to teach people skills for managing their problems, but, from the perspective of a fixed mindset, when anxiety is not changeable, that learning goal may seem less appealing and less fruitful. Another study examined actual responses to a clinical treatment (Valentiner, Jencius, Jarek, Gier-Lonsway, & McGrath, 2013). Exposure therapy is among the most effective means for reducing social anxiety, but it is

aversive because it requires people to confront their fears in vivo. For people to benefit, they need to have a goal of learning from the exposure. Unsurprisingly, then, clinically socially anxious individuals with a fixed mindset about shyness ended up with only about half the benefit of the exposure therapy reaped by those with a growth mindset.

### Summary

People in a fixed versus growth mindset contemplate the future in different ways as they formulate their goals (see Sevincer, Kluge, & Oettingen, 2014). In one meaning system, people have to worry about all the ways they can fail intellectually or socially and then guard against them. They do not want to earn a negative label in their own eyes or in the eyes of others. In the other meaning system, people are freer to consider what they want to learn, how they would like to grow, and who they want to become in the future. Of course, they need to plan how to do this effectively, but this involves strategizing about growth, not constantly guarding against the self-invalidating power of mistakes and setbacks.

### What Does Failure Mean?

What does failure mean and what does it make people do? Why are people who endorse a fixed mindset so afraid to venture out of their comfort zone to learn new and challenging things? We have glimpsed the answer, but let us take a full look at it.

#### Intelligence Mindsets and the Meaning of Failure

In the study by Blackwell et al. (2007), we saw that adolescents with different mindsets favored different goals. Here we note that their mindsets were also significant predictors of how they understood difficulty and reacted to it. Reacting to a vignette depicting academic failure, students with a fixed mindset were more likely to attribute the academic setback to deficient ability: “I wasn’t smart enough” or “I’m just not good at this subject.” For them, this sums it up: My ability has been measured and found wanting—perhaps forever.

So what did they do with this bad news? Compared with those with more of a growth mindset, they endorsed strategies that limited their future learning but allowed them to save face, such as: “I would spend less time on this subject from now on,” “I would try not to take this subject ever again,” and “I would try to cheat on the next test.” Feeling devoid of ability, students in a fixed mindset were left with fewer recipes for success.

However, those with a growth mindset, in line with their belief in malleable ability, more often faced the academic setback with a constructive plan: “I would work harder in this class from now on” and “I would spend more time studying for the tests.” This is perfectly sensible given their meaning system. It is not surprising, then, that their more learning-oriented goals, their more positive interpretations of failure, and their more productive reactions to failure predicted increasing math grades over time compared with their peers with a fixed mindset (see also Hong et al., 1999).

The Robins and Pals (2002) research confirms these disparate reactions to difficulty. In their study of college students, those with fixed mindsets were more likely to attribute an academic setback to a lack of ability, whereas those with growth mindsets attributed disappointing grades to their effort and study skills. In line with these different meanings, a fixed mindset was predictive of more “helpless” responses (“When I fail to understand something, I become discouraged to the point of wanting to give up”), whereas a growth mindset was predictive of more positive, constructive responses (“When something I am studying is difficult, I try harder”). In this longitudinal study, the primary outcome was students’ self-esteem trajectory over the college years. Independent of their grades and independent of their prior level of self-esteem, those with fixed mindsets were on a downward self-esteem spiral relative to those with growth mindsets. Again, this means that in the face of similar outcomes, a fixed mindset creates a meaning system in which a negative judgment is forever and people act accordingly. A growth mindset, regardless of current difficulties, leaves open the possibility of a brighter future and motivates people to work for it.

Can we observe these processes in the brain? Moser, Schroder, Heeter, Moran, and Lee (2011; see also Mangels, Butterfield, Lamb, Good, & Dweck, 2006) monitored college students’ online processing of errors via their event-related potentials (ERPs) during an ongoing task. As students made and detected their errors on this task, the ERP activity of those with growth mindsets revealed heightened attention to and processing of their errors, which then predicted increased performance on the next trials. That is, those with growth mindsets processed the errors more deeply and exerted greater control to correct them compared with those with fixed mindsets. The brains of those with a fixed mindset showed little activity in the relevant brain area, perhaps suggesting a flight from rather than an embracing of the errors. Thus the meaning people take from failure can have an important impact on how (or whether) they use errors or failures to help prepare for the future.

### Personality Mindsets and the Meaning of Rejection

Just as academic failure can signal to people in a fixed mindset of intelligence that they are “dumb,” so social failure can signal to people in a fixed mindset of personality that they are deficient, “losers,” or “not likable.” Whether you are trying to make friends or are in a close relationship, setbacks or rejections, and the permanent labels they imply within a fixed mindset, can be especially wounding and can lead to less constructive actions.

Specifically, Howe and Dweck (2016), studying adults’ attributions for rejection in close relationships, showed that those in a fixed mindset believed that rejection revealed their true, enduring self. As a result, they tended to carry this burden with them and let it affect their future relationships. Those in a growth mindset, in contrast, were more likely to view rejection as something they could learn from. In a study with children, Erdley et al. (1997, Study 1) found that in response to a (hypothetical) social rejection—not being selected as a pen pal—children in a fixed mindset entertained more fixed-trait attributions, such as “It made me wonder: Am I a likable person?”

Being in a fixed mindset can also lead people to attribute fixed traits to those who reject or offend them. That is, an entity theory predicts a tendency to make



dispositional rather than situational attributions for behavior (Chiu et al., 1997; cf. research on lay dispositionism, Ross & Nisbett, 1991) Yeager et al. (2011) found that peer rejection led to the attribution that the peers were “bad people” when peers had made fun of them and started rumors about them in school. Assigning meaning to rejection in terms of fixed traits can then elicit more extreme social emotions. Adolescents with a fixed mindset expressed both greater *shame* toward themselves and greater *hatred* toward peer rejecters (Yeager et al., 2011; cf. Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011). These attributions and negative emotions can lead to helpless or aggressive responses that do not solve the problem. It is not surprising, then, that a fixed mindset predicts greater stress and depression (Miu & Yeager, 2015; Yeager et al., 2011, 2014).

### Summary

By giving undue weight and significance to negative events, people in a fixed mindset can remain mired in the present or past. In addition, these negative events give them information about what they are not capable of doing or being in the future, rather than information about how to reach their future goals more effectively.

### **INTERVENTIONS: MINDSETS CAN CHANGE THE FUTURE**

By allowing people to transcend the here and now and plan for a better future (and a better self in the future), a growth mindset can potentially lead to better intellectual and social-emotional outcomes. We have already seen in the longitudinal studies, such as the Blackwell et al. (2007) and the Robins and Pals (2002) studies, that those with a growth mindset earned higher grades and experienced higher self-esteem over time than did those with a fixed mindset. Such findings pose the question of whether teaching a growth mindset would allow more people to reap these benefits.

### **Changing Intelligence Mindsets**

The first research to examine this question was a study by Aronson et al. (2002). In this research, college students were taught different ideas about intelligence. One group was taught a growth mindset—the idea that intelligence is expandable and that every time they learned new things, their brains formed new connections. They saw a film that illustrated this idea, they discussed it, and, in order to help them internalize the message, they mentored a younger student using growth mindset principles. Another group was taught the theory of multiple intelligences, with the message being not to worry if you lack intelligence in one area, because you may still have it in other areas. They, too, mentored younger children in terms of this theory. Finally, there was a third, no-treatment control group. Students who learned a growth mindset earned significantly higher grades that semester than students in the other two groups. Importantly, for African American students, the growth mindset also led to a significant increase in how important academics were in their lives and in how much they enjoyed their academic work.

In a later study, Blackwell et al. (2007, Study 2) gave seventh graders an eight-session workshop. All of the students in the workshop received lessons on study skills, but half of them also received several sessions on the growth mindset and how to apply it to their schoolwork. The growth mindset workshop, but not the control workshop, halted the decline in math grades shown prior to the intervention. In addition, teachers, blind to condition singled out significantly more of the children in the growth mindset group as showing enhanced motivation to learn and improve.

Finally, a recent study by Paunesku et al. (2015) showed that teaching a growth mindset could be implemented on a large scale to improve student performance. Students from 13 high schools, diverse in their sizes and student populations, completed an online module that was condensed from the Blackwell et al. (2007) materials. Compared with a control condition, struggling students who learned a growth mindset and how to apply it earned significantly higher grades by the end of the semester. Recent replication studies (e.g., Yeager, Romero, et al., 2016; Yeager, Walton, et al., 2016) also show the feasibility of these large-scale interventions and highlight their role in promoting educational equity for underserved minorities and students at risk for school dropout.

### **Changing Social-Personality Mindsets**

To date, most personality-mindset interventions have addressed mindsets in adolescents dealing with social stress (Yeager et al., 2014; Yeager, Lee, & Jamieson, 2016; Yeager, Miu, et al., 2013; Yeager, Trzesniewski, et al., 2013). These studies show that learning about people's potential for change can provide a basis for people to imagine a better future.

Growth mindset of personality interventions, such as those cited above, teach adolescents that people do not do things just because of traits that they have; they do things because of thoughts and feelings that they have—thoughts and feelings that live in the brain. Next, adolescents learn that the brain can change and grow new or stronger connections when people have life experiences that cause them to reconsider their behavior or change their values. Finally, adolescents learn that many former students like them have read and used this message to deal with their social difficulties and that they might find it helpful to do so, as well. The intervention seeks to go beyond the platitude of “people can change” and instead provide a mechanism, based in the neuroscience of adolescence, for the potential for change.

A first evaluation of this growth mindset of personality intervention tested for immediate effects (Yeager et al., 2011). Following a scenario of potential humiliation at the hands of peers—one in which the participant had done something embarrassing and now peers were starting rumors about him or her online—adolescents in the growth-mindset group showed a lower desire for revenge and a reduced belief that fantasizing about vengeance would make them feel better.

Subsequent evaluations of growth mindset interventions have put adolescents in socially difficult situations—such as an experience of ostracism via Cyberball (Williams & Jarvis, 2006) or the Trier Social Stress Test (Kirschbaum, Pirke, & Hellhammer, 1993)—and found that the growth mindset of personality reduced aggressive retaliation (Yeager, Trzesniewski, & Dweck, 2013), self-reports of stress, and

physiological stress responses (Schleider & Weisz, 2016; Yeager et al., 2014; Yeager, Lee, & Jamieson, 2016). For example, Yeager, Lee, and Jamieson (2016) showed that adolescents who were taught a growth mindset of personality appraised themselves as having the resources to meet the demands of a strong socially evaluative stressor (on the Trier Social Stress Test, Kirschbaum et al., 1993; see Blascovich & Mendes, 2010; Jamieson, Mendes, & Nock, 2013; Seery, 2013, for more on stress-inducing appraisals). Growth mindset participants furthermore showed improved cardiovascular responses to a stressor—by showing less constriction in the blood vessels and a more efficient heart—as well as lower levels of cortisol, a stress hormone that indicates feeling strongly negatively evaluated by others.

Can such effects endure over time? There is some encouraging evidence that they can, although these interventions are undergoing even more extensive testing. Yeager, Trzesniewski, et al. (2013) delivered an in-person workshop to mostly ninth- and tenth-grade adolescents attending a high school with high levels of peer aggression. Over the course of six classroom sessions, students received lessons on the brain and, in particular, on how personality can change during high school or after. One month after the sessions ended, Yeager, Trzesniewski, et al. (2013) found that adolescents responded less aggressively to Cyberball ostracism—that is, they allocated less punishment (less disliked spicy hot sauce) to the peer who had excluded them. Three months after the treatment, teachers who were blind to condition also nominated more students in the growth mindset treatment for improvements in their conduct toward peers and teachers in school.

Later experiments have attempted shorter and more scalable versions of the growth mindset of personality treatment: one-session guided reading and writing exercises completed via the computer. These have reduced levels of cortisol on high-stress days up to a week later (Yeager, Lee, & Jamieson, 2016), reduced stress and self-reported depressive symptoms at 8- to 9-month follow-up (Miu & Yeager, 2015; Yeager et al., 2014) and even improved grade point average in core classes over the first year of high school (Yeager et al., 2014; Yeager, Lee, & Jamieson, 2016). If replications in larger samples continue to find promising results for the online growth mindset of personality intervention, it could eventually represent a promising way to help young people create a more hopeful future, despite their current social difficulties.

### Summary

Online or in-person workshops that teach students a growth mindset and how they can use it in their lives have the potential to change how students think about the future and to change what actually happens to them in the future in terms of their academic motivation and achievement, their social relations, and their mental health.

## THINKING ABOUT THE FUTURE

We have seen how orienting people toward a growth mindset—the idea that even our most basic attributes are capable of growth—can prevent them from becoming

mired in the inevitable setbacks and failures that occur. Instead, this mindset encourages them to keep their eye on a more positive future and to think about how to bring it about.

We suggest that this is true not just at the level of the individual, but also at the level of organizations and even nations. New work by Canning, Murphy, Emerson, Chatman, et al. (2017) demonstrates that whole organizations, in this case large corporations, can embody a fixed or a growth mindset. In this research, companies that embodied a growth mindset (those that, according to employees, believed in and valued the development of everyone's abilities) were seen as supporting far more risk taking in the service of future innovation than companies that believed in and valued fixed talent. The growth mindset companies, by supporting and rewarding creativity, were able to create environments—"cultures of development"—in which people said they could focus on longer-term learning. Employees in the fixed mindset companies were, instead, more likely to report widespread cheating and hoarding of information, presumably in the service of proving oneself to be one of the talented few. An important task for the future is to understand how to create growth mindset cultures, be they in schools or business organizations, that work to spur the development of abilities in the many, rather than seeking to simply find the few who are identified early on as "talented" (see Dweck & Hogan, 2016, for how Microsoft has taken up this challenge).

More generally, as people enter a new place or role—a new college, a new job, a new relationship, and so on—they reasonably wonder what it will be like for them. That is, they try to discern what their future will look like. The mindsets provide a set of starting assumptions for individuals engaging in that future-oriented thinking. A fixed versus growth mindset can determine people's projections about whether their new environment is one that will allow growth and learning from mistakes, or one that will rush to put them in a box that defines their potential. It will be exciting in new research to identify transition points in people's lives and to try to help people carry their productive mindsets with them, or rapidly acquire new, more constructive mindsets upon arrival (e.g., Yeager, Walton, et al., 2016).

Research by Halperin et al. (2011) takes this idea to another level. Halperin et al. (2011) proposed that people could see whole groups or nations as embodying inherent, fixed characteristics or as capable of growth and change. They then tested whether instilling mindsets about groups could change Israelis' and Palestinians' attitudes toward each other. Importantly, they found that learning a growth mindset about groups led to less animosity and greater willingness to entertain serious compromises for the sake of peace on the part of both groups. These long-standing adversaries were now, at least for the moment, willing to glimpse a future that was different from the past.

Thinking about psychological interventions in general (see Walton, 2014; Yeager & Walton, 2011), we propose that successful psychological interventions are often ones that, by teaching new beliefs, motivations, or self-regulatory skills, allow people to see beyond a problematic present and begin to work toward a more promising future. By doing so, these interventions underscore the tremendous power of people's psychology to shape their futures. But they also underscore the malleability of our psychology and the promise this malleability holds for helping people envision and attain productive and fulfilling futures.

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