CHAPTER TWO

# The evolution of mindset research: Forging connections across individuals, situations, and cultures

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## Abstract

Mindset theory was originally developed to address a puzzling question of motivation: why do once motivated and eager children become disengaged, disinterested, and unwilling to learn? Decades of research has explored and continues to examine how people's beliefs about the fixedness or malleability of intelligence and ability (i.e., entity and incremental lay theories, or fixed and growth mindsets) form a meaning system that shapes their goals, beliefs, and behavior. This chapter describes how the field of mindset science has evolved over time—as all good scientific theories do—updating as new evidence, critiques and challenges, and common misconceptions spur deeper theory development and additional investigations. Here, we examine three levels of mindset research: the micro-level (mindset as an individual difference), the meso-level (situational and interpersonal nature of mindset), and the macro-level (mindset as a cultural factor). Finally, we discuss several avenues for future research in order to understand how to create robust, engaging environments where all people are provided with the opportunity and support to grow, develop, and learn.

*"I will never forget one young man, who, when the difficult problems started, pulled up his chair, rubbed his hands together, smacked his lips, and said, 'I love a challenge.' Or another, who as the difficulty began, told us in a matter-of-fact voice 'You know, I was hoping this would be informative.' Or another child who asserted cheerfully, 'Mistakes are our friend.'"*

*-Carol Dweck (Dweck, 1999, p. 32).*

Mindset theory was originally developed to address a puzzling question of motivation: how do children start out so motivated and eager to learn and then, over time, become disengaged, disinterested, and even unwilling to learn (Dweck & Yeager, 2019; Dweck, 1999)? The earliest tests of this theory explored how mindset beliefs about intelligence and ability (i.e., entity and incremental lay theories, or fixed and growth mindsets) form the basis of a meaning system that shapes people's goals, beliefs, and behavior (Dweck & Leggett, 1988; Molden & Dweck, 2006). Carol Dweck and colleagues proposed that some people develop an *incremental theory* about intelligence (later called a *growth mindset*), which holds that intelligence is malleable and incrementally grown. These incremental theorists believe that everyone can develop and increase their intellectual abilities with practice, learning, and sufficient guidance and support. Other people, however, develop an *entity theory* of intelligence

(later called a *fixed mindset*), which holds that intelligence is a fixed entity—you have a certain amount of it, and you cannot do very much to change it. Unlike incremental theorists, entity theorists believe that intelligence is a stable trait, largely set in stone (Dweck, Chiu, & Hong, 1995; Dweck, 1999). As illustrated in the quote above from children who participated in the very earliest mindset studies, growth mindsets have the potential to inspire people to relish challenges, learn from mistakes, and develop their skills and abilities. Indeed, a large body of research has documented the significance of mindset in educational and organizational contexts around the globe.

Mindset scholarship has spanned more than four decades. Many reviews of the literature exist (including a previous *Advances* chapter on the role of mindset in social and moral cognition, Plaks, 2017), and fixed and growth mindset beliefs about many different characteristics have been studied, including beliefs about personality (e.g., Chiu, Hong, & Dweck, 1997b); the "kind of person" people are (e.g., Heslin & VandeWalle, 2008; Yeager et al., 2014); morality and justice (e.g., Chiu, Dweck, Tong, & Fu, 1997a; Feng, Keng-Highberger, Li, & Savani, 2023; Miller, Burgoon, & Hall, 2007); relationships (e.g., Burnette & Franiuk, 2010; Canevello & Crocker, 2011; Knee, 1998; Mattingly, McIntyre, Knee, & Loving, 2019); groups (e.g., Goldenberg et al., 2018; Halperin, Russell, Trzesniewski, Gross, & Dweck, 2011; Rattan & Georgeac, 2017); prejudice (e.g., Rattan & Dweck, 2010, 2018; Rattan, Kroeper, Arnett, Brown, & Murphy, 2023; Rattan, 2019); the universality of different characteristics (Rattan, Savani, Naidu, & Dweck, 2012); and the world (e.g., Chiu et al., 1997a; Yang & Hong, 2010). This chapter does not aim to provide a comprehensive review of all this previous research. Instead, we focus primarily on mindsets about intelligence and ability. Here we explore how the field of mindset science has evolved over time—as all good scientific theories do—updating as knowledge accrues and new evidence and critiques spur deeper theory development and additional investigations. We examine three levels of mindset research, depicted in Fig. 1): the micro-level that focuses primarily on mindset as an individual difference; the meso-level that focuses on the situational and interpersonal nature of mindset; and the macro-level that focuses on mindset as a cultural factor that shapes people's experiences and outcomes. We address common misconceptions and challenges in mindset research and show how the field has responded. Finally, we leave the reader with several puzzles for future research. Indeed, one of the most consequential tasks for the future of mindset theory and research will be to investigate the interplay between the individual, situational, and cultural

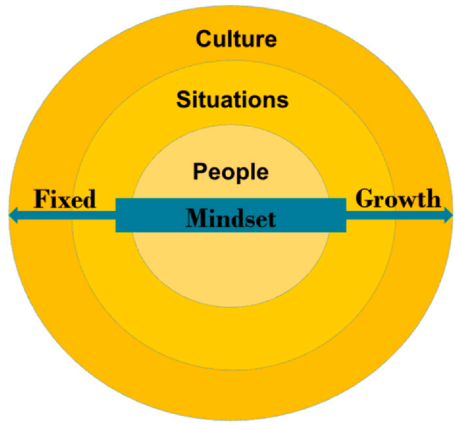


**Fig. 1** The relationship between the micro-, meso-, and macro-levels of mindset beliefs about intelligence and ability.

levels of mindset in order to understand how to create robust, engaging environments where all people experience the joy of learning as much as the children quoted above. We start at the beginning, exploring the role of mindset beliefs at the individual level.

## 1. The micro-level: Mindsets as individual differences

The original era of mindset research opened by proposing a new model about how "people develop beliefs that organize their world and give meaning to their experiences" (Dweck, 1999, p.15). Dweck and Leggett (1988) posited that people form *lay theories*—everyday, common-sense beliefs—about how human characteristics work (Dweck, 1999). These beliefs form *meaning systems* that in turn guide people's goals and behavior. The initial mindset research used this theoretical framework to explore people's beliefs about intelligence, theorizing that some people endorse growth mindset beliefs (i.e., intelligence is malleable and can be developed over time with learning, practice, and sufficient guidance and support), whereas other people endorse fixed mindset beliefs (i.e., intelligence is a stable, innate trait that cannot be changed; Dweck et al., 1995; Dweck, 1999).

During this period, study after study showed that these entity (fixed) or incremental (growth) lay theories had meaningful consequences for people's goals, motivation, behavior, and performance (for reviews, see: Dweck & Leggett, 1988; Dweck & Sorich, 1999; Dweck, 1999). For example,

researchers learned that when people's theories of intelligence were measured or induced through experimental manipulations, people who endorsed more fixed-minded beliefs were more likely to adopt performance goals—a desire to appear smart and, above all else, avoid looking dumb (Dweck & Elliott, 1983; Dweck & Leggett, 1988). It turned out that when people believed intelligence was a fixed entity, they worried about exactly how much intelligence they had, and they became preoccupied with proving to themselves and others that it was enough (Dweck & Bempechat, 1983; Nussbaum & Dweck, 2008).

Why do these kinds of goals matter? Research shows that performance goals predict maladaptive attitudes and behavior when people face challenges and failure (e.g., Diener & Dweck, 1978, 1980; Elliott & Dweck, 1988; Licht & Dweck, 1984; Robins & Pals, 2002). People operating with more fixed mindset beliefs see intellectual challenges (like difficult tasks that require a lot of effort) and failure as threats to their intelligence (Dweck & Sorich, 1999). For example, Elliott and Dweck (1988) found that when students were focused on performance goals—worrying about how their ability was being judged—they were more likely to have a helpless response to failure, denigrating their ability and losing confidence in their chances of future success. This and subsequent research demonstrated clear links between people's fixed mindset beliefs and their attitudes about the relationship between effort and ability (termed *effort-ability beliefs*). Specifically, when people endorse fixed mindset beliefs, they often also believe in a negative relationship between effort and ability. That is, they believe that if something requires a lot of effort, it means that one lacks "natural ability" in that area and conversely, if one has natural ability, they should not have to work very hard (for a review, see Muenks & Miele, 2017). Perhaps it is not surprising then that people with strong fixed mindset beliefs avoid challenges—especially those that require a lot of effort—and they often give up when tasks become difficult because they interpret challenges and difficulty as possible indicators that they lack ability (e.g., Hong, Chiu, Dweck, Lin, & Wan, 1999).

In addition to adopting performance goals, researchers discovered that people who endorsed fixed mindset beliefs became defensive in response to negative feedback—denying responsibility for their mistakes, avoiding critical feedback that could help them improve, and shying away from situations that have the potential to highlight their weaknesses (Dweck & Elliott-Moskwa, 2010; Ehrlinger, Mitchum, & Dweck, 2016; Nussbaum & Dweck, 2008). For example, Nussbaum and Dweck (2008) demonstrated

that people adopt different patterns of social comparison following negative performance feedback, depending on their mindset. In this study, adult participants were experimentally induced to adopt either a fixed or growth mindset about intelligence. Then, they took a test and were told that they performed poorly on it—however, they could retake the test later in the session. In the meantime, they were given the opportunity to view the performance and strategies of previous test-takers. More than 40 % of fixed-minded participants opted to make a downward social comparison—viewing the results and strategies of those who did *worse* than them. Viewing these worse results and strategies, the researchers theorized, would make participants feel good, preserving their self-esteem that had been threatened by the negative performance feedback. Yet, it also meant that they would not learn new strategies or approaches for the upcoming retest. The defensive behavior engendered by a fixed mindset protected their need to feel good and competent, but it had the maladaptive consequence of impeding their ability to learn and improve.

Another way defensiveness emerges among those who endorse fixed mindset beliefs about intelligence is through overconfidence. Ehrlinger and colleagues (2016) showed that fixed-minded participants (whether mindset was measured or experimentally induced), compared to growth-minded participants, were more overconfident in their abilities and that this overconfidence stemmed in part from motivated attention. In one study, participants who were taught fixed- (vs. growth-) minded views about intelligence spent less time on difficult problems and as a result were more overconfident about their performance. When the researchers disrupted this defensive behavior—by directing test-takers' attention toward more difficult problems—fixed-minded participants reduced their confidence estimates and became more accurate in their predictions of their performance.

Finally, research has demonstrated that when people espouse fixed-minded beliefs, they feel a pressure to perform–a pressure that can lead to problematic behaviors like cheating or covering up mistakes in an attempt to conceal shortcomings in their abilities and competence from others (e.g., Blackwell, Trzesniewski, & Dweck, 2007; Corrion et al., 2010; Mueller & Dweck, 1998). For example, Blackwell and colleagues (2007) asked middle school students to reflect on their beliefs about intelligence and then to imagine failing an important quiz. When asked how they would respond, students who endorsed fixed (vs. growth) mindset beliefs were more likely to report that they would consider cheating after the hypothetical failure. In other work, students who endorsed more fixed mindset beliefs were

more accepting of cheating (Corrion et al., 2010). When examining actual cheating behavior directly, Mueller and Dweck (1998) found that when children were praised for their ability—shifting them toward fixed mindset beliefs—38 % misrepresented their scores by increasing them in order to appear more competent, compared to 14 % of children in a control group.

At the same time, scholars discovered a lot about how growth mindset beliefs create meaning systems that shape people's downstream motivation, goals, and behavior in different ways. In contrast to fixed mindset beliefs, growth mindset beliefs cause people to adopt learning goals—a desire to not just perform well but also to develop skills and master new challenges (Dweck & Elliott, 1983; Dweck & Leggett, 1988; Dweck & Sorich, 1999). When people endorse stronger growth mindset beliefs, they are more likely to see challenges and failure not as threats to intelligence, but as opportunities to strengthen their abilities (Diener & Dweck, 1978, 1980; Licht & Dweck, 1984). Rather than signaling a lack of "natural ability," growth-minded individuals are more likely to see a *positive* relationship between effort and ability. Indeed, effort is seen by these individuals as a tool for learning and essential for intellectual development—like exercise for the brain, effort is key to building and growing intelligence (Dweck & Sorich, 1999). Likewise, mistakes and failures are considered a normal part of the learning process, not something to be feared and avoided (Dweck & Sorich, 1999; Dweck, 1999). Feedback, too, is more likely to be sought and welcomed as a resource rich with insight for improvement (Ehrlinger et al., 2016; Nussbaum & Dweck, 2008). In fact, students who adopt growth mindset beliefs about intelligence will often sacrifice opportunities to look smart in favor of opportunities to learn something new. For example, in the Nussbaum and Dweck (2008) studies that gave people negative performance feedback following an intellectual test, more than 90 % of growth-minded test takers opted to make *upward* social comparisons by viewing the strategies of people who performed better than them. Why? Because it was only in viewing the strategies of those who bested the task that they would learn how to improve their score on the retest that was to come. Additionally, the defensiveness observed in fixed-minded individuals is relaxed in growth-minded individuals. In fact, those with strong growth mindset beliefs are more inclined to take remedial action (like opting to enroll in a remedial course) when they realize that their current skills that are essential for their future success are unsatisfactory (Hong et al., 1999). Finally, those who endorse growth mindset beliefs are less likely to accept cheating or to engage in it because cheating robs them of

opportunities to learn (Blackwell et al., 2007; Corrion et al., 2010; Mueller & Dweck, 1998). Perhaps the power of growth mindset beliefs can be summed up by Dweck's observations of children who encountered difficult intellectual challenges in her studies, as quoted at the start of this chapter. These children relished the challenge, asked for more time because they felt they were on the verge of getting it, and welcomed mistakes because these strategies would help them learn (Dweck, 1999).

Although mindset was originally a theory of motivation focused on goals and goal-directed behavior, scholars have also explored the link between mindset beliefs and performance. Research finds that fixed mindset beliefs are associated with *lower* achievement on lab-based tasks and tests and in real-world performance contexts like classrooms and schools, whereas growth mindset beliefs are associated with *higher* achievement (e.g., Blackwell et al., 2007; Claro, Paunesku, & Dweck, 2016; McCutchen, Jones, Carbonneau, & Mueller, 2016; Organisation for Economic Co-operation & Development, 2021; West, Buckley, Krachman, & Bookman, 2018; Yeager et al., 2019; for a meta-analysis on performance outcomes, see Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). For example, a longitudinal study in the U.S. by Blackwell and colleagues (2007) found that stronger growth mindset beliefs at the beginning of junior high predicted higher math grades two years later. A nationwide study of high school students in Chile found that growth mindset beliefs were a strong predictor of students' achievement on standardized tests of language and mathematics—and were as predictive of these test scores as family income (Claro et al., 2016). In 2018, the Organiation for Economic Co-operation and Development (OECD)'s Programme for International Student Assessment (PISA) that included 78 countries found that students with stronger growth (vs. fixed) mindset beliefs scored 31.5 points higher on the PISA reading assessment, 27 points higher on the science assessment, and 23 points higher on the math assessment after accounting for the socio-economic status of students and schools (Organisation for Economic Co-operation & Development, 2021).

How do growth mindset beliefs spur higher performance? A meta-analysis revealed that growth-minded beliefs engender more effective goal setting, goal pursuit, and self-regulation strategies (Burnette et al., 2013). Consistent with the meaning system theory originally proposed by Dweck and colleagues (Dweck, 1999; Molden & Dweck, 2006), growth mindset beliefs increase people's use of mastery-oriented strategies (like changing strategies that do not work and seeking help when necessary), lower people's tendencies to experience negative emotions in the face of effort and challenges, and increase people's expectations for success.

## 1.1 Individual-focused mindset interventions

Given early evidence demonstrating the influence of children's (measured) mindset beliefs on their goals, behavior, and academic outcomes, researchers became increasingly interested in whether mindsets could be taught in order to improve these downstream outcomes. Early studies investigated the effects of experimental manipulations designed to shift students toward a growth mindset (Aronson, Fried, & Good, 2002; Chiu et al., 1997b). For example, Aronson and colleagues (2002) asked college students to read and respond to letters completed by ostensibly at-risk middle school students that described their struggles in school. College students randomly assigned to the growth mindset intervention condition watched a video describing the ways in which the brain—and hence intelligence—can grow and make new connections throughout one's life; students assigned to the control condition read about the multifaceted nature of intelligence. After viewing these videos, participants were asked to respond to the middle school children's letters by sharing what they had learned. Results revealed that college students who read and shared the growth mindset message reported personally believing that intelligence is more malleable relative to control group students, and this shift in mindset beliefs endured for 9 weeks. In addition, college students in the growth mindset condition earned higher GPAs relative to their control group peers (Aronson et al., 2002).

Some of the earliest mindset interventions among adolescents took the form of in-person workshops with multiple sessions where students were taught about the benefits of having a growth mindset and then were compared to students in a control group (Blackwell et al., 2007; Good, Aronson, & Inzlicht, 2003). For example, in research conducted by Blackwell and colleagues (2007), middle school students participated in an 8-week workshop delivered during their advisory period by highly trained facilitators in which they learned how the brain grows and develops with the adoption of specific learning strategies. Students randomly assigned to the growth mindset training condition were taught, via science-based readings, activities, and discussions, that intelligence is malleable and can be developed; for example, students in this condition read an article entitled "You Can Grow Your Intelligence" where they learned that the brain forms new connections when engaging in learning. Afterward, students engaged in discussions and activities that supported these ideas. These intervention materials were developed based on prior experimental research demonstrating the successful manipulation of

growth mindset beliefs in lab settings (Aronson et al., 2002; Chiu et al., 1997b). In contrast, students in the control condition read an article entitled "Memory" and engaged in discussions on topics such as academic difficulties and successes and the role of memory and the brain. Results of this program revealed that students in the experimental group more strongly endorsed growth mindset beliefs about intelligence after participating in the intervention whereas those in the control group did not experience a significant shift in their beliefs. Furthermore, students who learned that intelligence can be developed showed greater classroom motivation and were buffered against a decline in grades over the course of the year that was observed among control group students (Blackwell et al., 2007).

Observing how these interventions shaped students' motivation and academic performance, researchers focused on scaling up these interventions so that they could be studied among thousands of students—and so that the heterogeneity of effects (i.e., when and for whom these interventions work best) could be tested (Bostwick & Becker-Blease, 2018; Broda et al., 2018; Fink, Cahill, McDaniel, Hoffman, & Frey, 2018; Paunesku et al., 2015; Suh, Dahlgren, Hughes, Keefe, & Allman, 2019; Yeager et al., 2014; Yeager et al., 2019; Yeager et al., 2022; Yeager, Romero et al., 2016a; Yeager, Walton et al., 2016b). These mindset interventions include shorter versions of the in-person interventions that can be delivered directly to students online (e.g., two sessions about 1–4 weeks apart, instead of 8 sessions; Paunesku et al., 2015; Yeager et al., 2016b). Like the in-person workshops, the online growth mindset intervention content features neuroscience findings describing the malleability of intelligence and how intelligence and the brain develop when encountering challenges and adopting good learning strategies (Paunesku et al., 2015; Yeager et al., 2016b). As in the previous studies, students are often encouraged to engage in a "saying-is-believing" writing exercise (Aronson, 1999) where they summarize what they have learned and share it with others (often in the form of a letter) —a practice that increases the likelihood of self-persuasion and internalization of the intervention's message (Yeager et al., 2016a, 2016b; Yeager et al., 2019). These large-scale online growth mindset interventions have been associated with stronger growth mindset beliefs about intelligence and improved grades, as well as a host of other positive motivational outcomes, including increased challenge-seeking behavior, higher rates of full-time college enrollment, and greater persistence and retention through college—particularly among lower-achieving students (e.g., Broda et al., 2018; Paunesku et al., 2015;

Suh et al., 2019; Yeager et al., 2016a, 2016b; Yeager et al., 2019). In an ambitious study of a nationally representative sample of more than 12,000 ninth grade students in the U.S., Yeager and colleagues (2019) found that a one-hour online growth mindset intervention was particularly effective in contexts where peer norms supported challenge seeking and were thus aligned with the message of the intervention (a point we return to later).

More recently, this intervention approach has demonstrated positive effects of individual-focused growth mindset interventions on subsequent mindset beliefs, behavior, and performance in several other contexts. For example, individual-focused growth mindset interventions have been shown to be effective in improving employees' happiness and willingness to help others develop in the workplace (i.e., Berg, Wrzesniewski, Grant, Kurkoski, & Welle, 2023; Rogers, Christian, Jennings, & Lanaj, 2023). Similarly, in the domain of personality and sociability, a growth mindset intervention has been found to reduce aggression among adolescents (Yeager, Trzesniewski, & Dweck, 2013).

## 1.2 The mindset continuum

Much of the focus at the micro-level of mindset research has been to establish mindsets as an individual difference and explore the links between these beliefs and people's goals and behavior (e.g., Dweck & Leggett, 1988; Dweck et al., 1995). However, even from early work—and especially as research explored the impacts of individual-focused growth mindset interventions—it was clear that people could access and take on more fixed or growth mindset beliefs based on their exposure to information and their interactions with others. Studies and interventions seeking to demonstrate the causal role of mindset beliefs showed that these beliefs can be experimentally induced, often by exposing people to scientific information that describes research supporting either a fixed or growth mindset view and helping them internalize these ideas through activities and practice (e.g., Aronson et al., 2002; Blackwell et al., 2007; Nussbaum & Dweck, 2008; Plaks & Stecher, 2007; Yeager et al., 2016a, 2016b; Yeager et al., 2019). Thus, instead of considering mindset as a fixed trait within people (wherein people possess *either* fixed *or* growth mindset beliefs), a more accurate characterization of mindset is that although people may chronically endorse more fixed or growth mindset beliefs about intelligence in general (i.e., have a mindset "set point"; Murphy, Taylor, & Steele, 2024), they can find both sets of beliefs plausible and move along a *fixed-growth mindset continuum* based on information and interactions in their local environments (Murphy & Reeves, 2019; Murphy, 2024; represented by the teal arrows in Fig. 1).

## 2. The meso-level: Situational mindset triggers and interpersonal interactions

As research revealed how important mindset beliefs were for creating and maintaining a meaning system that guides people's motivation, attitudes, and behavior, natural next questions emerged: what impacts whether someone adopts more fixed or growth mindset beliefs? What moves people along the mindset continuum toward a fixed or growth mindset? How can we help people adopt more growth-minded beliefs (i.e., move them toward a growth mindset)? One approach has been to examine how different contexts and situations influence people's mindset beliefs. Previous research and theorizing have identified at least four interpersonal situations (termed *mindset triggers*) that shift people between their fixed and growth mindsets (for a review, see Murphy & Reeves, 2019 and Murphy, 2024). These four situations are those involving evaluation, high-effort, critical feedback, and the success of others.

### 2.1 Mindset triggers

#### *2.1.1 Evaluative situations*

Evaluative situations are those in which people anticipate being assessed by others. Much of the early mindset research with children in educational settings observed how common evaluative situations—like asking children to solve difficult puzzles or tasks in the lab or examining how teachers evaluate students in field settings—could bring forward children's fixed or growth mindsets. Likewise, in the workplace, managers set up evaluative situations for their employees by giving them assignments that will be assessed by their manager, peers, or clients. People are situationally triggered towards a growth or fixed mindset in evaluative situations because they expect that others will be appraising their work, and may use such appraisals to form judgments about them (including about their intelligence, competence, and abilities). When people are triggered toward their fixed mindset in evaluative situations, they are more likely to adopt performance goals. That is, they are more concerned about presenting themselves in the best light by demonstrating their competence and intelligence on the tests or tasks that are assigned to them (e.g., Blackwell et al., 2007; Dweck & Leggett, 1988). Due to this focus on showcasing one's competence and intelligence, people triggered toward their fixed mindset double-down on behavioral strategies to appear smart. For example, an individual preparing for a big presentation may avoid using

material that might highlight any challenges or setbacks. They also may not leave much room for feedback or questions because doing so might increase their risk of not appearing smart.

On the other hand, when people are situationally triggered toward their growth mindset in evaluative situations, they are more likely to adopt learning goals. That is, they use evaluative situations as an opportunity to learn and develop their ideas and subsequently engage in behavioral strategies geared toward growth and development. For example, when preparing for an important presentation, an individual in their growth mindset may highlight their successes alongside challenges they faced and how they overcame (or have yet to overcome) these challenges. Furthermore, they actively seek feedback and are less hesitant to leave room for questions so they can learn as much as possible. Thus, in evaluative situations, those people who are triggered into their fixed mindset are more concerned about *proving* their abilities; in contrast, those who are triggered into their growth mindset are more concerned about *learning and developing* their abilities (e.g., Nussbaum & Dweck, 2008).

### 2.1.2 High-effort situations

High-effort situations are those in which sustained focus, effort, time, and mental resources are needed to successfully complete a task, including novel situations (such as when starting a new project or joining a new team at work). High-effort situations often trigger people into their fixed mindsets when they hold (or are induced to hold) *effort-ability beliefs* that posit a negative relationship between effort and ability (e.g., Muenks & Miele, 2017)—that is, if one has to try hard, it must mean that they don't have strong ability in a domain. For these people, working on a high-effort task produces friction and reduces motivation and persistence (e.g., Blackwell et al., 2007). As a result, they might avoid or quit high-effort tasks so as to not risk being viewed as incompetent and incapable. On the other hand, when people espouse (or are induced to espouse) a positive relationship between effort and performance, they often are triggered toward their growth mindset by high-effort situations, and they approach these situations as an opportunity to improve their ability and skills.

### 2.1.3 Critical feedback

Whereas in evaluative situations people *anticipate* receiving feedback, in critical feedback situations, people actually *receive* that evaluative feedback. As we have seen in the studies reviewed above, critical feedback can come

when parents or teachers respond to children's or students' mistakes or failures, or when employees receive negative performance evaluations at work. When people are triggered toward their fixed mindset, they are more likely to take critical feedback personally, seeing it as an indictment of their abilities and skills (Dweck, 1999). As a result, they are more likely to make global, stable, and negative attributions about their abilities after receiving critical feedback (e.g., Hong et al., 1999) and they may doubt that there is room for improvement, thus responding with defensive or helpless behavior, withdrawal, or avoidance (e.g., Heyman, Dweck, & Cain, 1992; Nussbaum & Dweck, 2008). On the other hand, when people are triggered toward their growth mindset after receiving critical feedback, they view the feedback as a roadmap to guide their learning and growth and they are more likely to adopt and pursue strategies and learning goals that help them do so (e.g., Elliott & Dweck, 1988; Nussbaum & Dweck, 2008).

#### *2.1.4 Success of others*

The success of others refers to any situation where someone else is recognized and lauded, such as when a peer solves a problem more quickly and efficiently in class or a colleague receives an award, bonus, or promotion at work. Often, the success of others elicits social comparison processes. Those who are triggered toward their fixed mindset after witnessing someone else's success tend to lose motivation and disengage from tasks, thus missing out on opportunities to learn from successful others (Blackwell et al., 2007; Dweck & Leggett, 1988; Nussbaum & Dweck, 2008; Rhodewalt, 1994). This reaction occurs because, according to a fixed mindset, success is something you either do or do not have; when others are more successful, fixed mindset beliefs can trigger zero-sum thinking and helpless behavioral responses (e.g., Dweck & Leggett, 1988; Dweck et al., 1995; Heyman & Dweck, 1998; Heyman et al., 1992). On the other hand, when people are triggered into their growth mindset by the success of others, they find inspiration from the success and become motivated to learn strategies and solutions that they can apply to achieve their own success (Nussbaum & Dweck, 2008).

#### *2.1.5 Summary of mindset triggers*

Taken together, conceptual analysis of the mindset literature has identified common situations that can trigger people along the mindset continuum toward their fixed or growth mindset (e.g., Murphy & Reeves, 2019). More recent research has focused on understanding how interpersonal

interactions shape these situations (e.g., how evaluative assignments are made, how stretch opportunities are described, how critical feedback is delivered, and how teachers, parents, and leaders praise others), illuminating the conditions under which people are more or less likely to be operating from their fixed or growth mindsets. This knowledge sets the stage for cultivating situations where people are more often triggered into their growth (vs. fixed) mindset, and in turn are more motivated, engaged, productive, and successful.

## 2.2 Interpersonal interactions

In order to understand *why* or *how* different situations might trigger people into their growth or fixed mindset, scholars have examined the features of interpersonal interactions that shape people's mindset beliefs, including how these beliefs are transmitted and communicated between individuals. Most notably, special attention has been paid to the interactions that occur between parents and children at home, teachers and students at school, and managers and employees at work. Given the importance and interdependence of these relationships, these interactions may be particularly critical in shaping people's mindset beliefs and behavior across the lifespan.

### *2.2.1 Adult-child interactions*

Mirroring Dweck's own focus on development, many scholars have examined how adults' (for example, parents' or teachers') attitudes and behaviors shape children's mindset beliefs. For example, researchers have explored how adults' reactions to children's failures and successes shape children's mindsets. Heyman and colleagues (1992) investigated whether teachers' use of criticism that reflected stable and global (i.e., fixed) beliefs about children's "goodness" would impact children's own mindset beliefs about intelligence and competence. Working with 5- and 6-year-old children, these researchers found that, after imagining teachers' criticisms of their work as deficient (not being done "the right way") coupled with expressions of disappointment ("I'm disappointed in you."), children who subsequently downgraded the quality of their own work went on to endorse more fixed-minded beliefs about badness (e.g., badness is a fixed trait), demonstrate greater learned helplessness (e.g., less task persistence), and make more negative self-judgments (e.g., "I am not a good person").

Research about how parents and teachers *praise* children also has been linked to children's responses to challenges and mistakes. For example, many teachers and parents praise children's abilities and intelligence

("Wow, you're so smart!"). This type of praise might not seem so bad at first blush ("What's so harmful about a child thinking they are "smart"?"); yet, when children of these parents and teachers later face challenges or setbacks, they demonstrate more helplessness behavior, including withdrawing from challenging tasks (Cimpian, Arce, Markman, & Dweck, 2007; Gunderson et al., 2013; Kamins & Dweck, 1999; Pomerantz & Kempner, 2013). This type of ability praise tends to backfire because it sets children up to see intelligence as something that children do or do not have (fixed mindset beliefs)—and when praised for their abilities, they are being told that they have it. However, when children encounter hardships or obstacles in the learning process, those challenges pose a threat to their self-views and they start to see themselves as less smart, capable or competent because they are struggling (Kamins & Dweck, 1999).

What can parents and teachers do instead? Praising children's process—including the hard work and learning strategies they use—can shift children toward more of a growth mindset; and when children occupy their growth mindset, they display mastery-oriented responses to challenges and failure (Cimpian et al., 2007; Gunderson et al., 2013; Kamins & Dweck, 1999; Pomerantz & Kempner, 2013). Specifically, scholars found that when children receive process praise, they are more motivated and resourceful in the face of difficulties, believing that they can simply try new strategies or seek help to reach their goal instead of making fixed dispositional attributions (like "I'm not smart enough") that sap motivation and performance (Kamins & Dweck, 1999). In six experiments conducted with fifth graders, Mueller and Dweck (1998) found that students praised for their effort (e.g., "You must have worked hard at these problems"), relative to those praised for their intelligence (e.g., "You must be smart at these problems"), were more likely to describe intelligence as something that can be improved. Using a daily diary method, Pomerantz and Kempner (2013) found that the more that mothers praised their children's process (as opposed to their personal abilities), the more their children endorsed growth mindset beliefs at a later timepoint, over and above their beliefs at an earlier timepoint. Indeed, it seems that the type of praise received early in life can influence children's beliefs years later. For example, Gunderson and colleagues (2013) found that parents' early praise of children's effort at 14–38 months was associated with more growth mindset beliefs among children when they were 7–8 years of age.

Further research in the developmental domain has explored how mindsets are socialized in children. Several studies revealed that children's

mindset beliefs are shaped by parents' (Gunderson et al., 2013; Haimovitz & Dweck, 2016) and teachers' (Park, Gunderson, Tsukayama, Levine, & Beilock, 2016; Sun, 2018) verbal and nonverbal behavior. For example, Haimovitz and Dweck (2016) theorized that although parents' mindset beliefs likely shape their own goals and behaviors, parents' beliefs might primarily influence their children's beliefs to the extent that they led to parenting *practices* that children can recognize and pick up on. Consistent with their theory, parents' beliefs predicted their verbal, nonverbal, and emotional responses when their child failed or struggled in school, which in turn impacted their adoption of more performance-oriented (e.g., communicating to their child that failure is bad and should be avoided, through their worries about failure or disappointment with failure) or learning-oriented responses (e.g., communicating to their child that failure is an opportunity to learn, through their positivity in response to failure). These responses, in turn, impacted children's mindsets about intelligence. When parents communicated that failure was debilitating, their children walked away with more fixed mindset beliefs; however, when parents communicated that failure was enhancing, their children walked away with more growth mindset beliefs. Indeed, when parents were *primed* with different failure mindsets, these mindset beliefs caused parents to respond differently to their children's failures, expressing concerns about their child's performance and lack of ability when they were primed to believe failure was debilitating and reacting with more support for their child's learning and mastery when primed to believe failure was enhancing. In turn, these failure-is-debilitating beliefs (vs. failure-is-enhancing beliefs) impact whether their child believes that intelligence is fixed (vs. malleable; Haimovitz & Dweck, 2016).

Similar findings have emerged in schools. Research with early elementary teachers found that although teachers' self-reported intelligence mindset beliefs do not *directly* impact student outcomes, they do so *indirectly* through teachers' adoption of mindset-consistent behaviors. For example, fixed-minded teachers were more likely to use performance-oriented instructional practices (such as emphasizing the importance of getting good grades and displaying competence) relative to mastery-oriented instructional practices (such as emphasizing learning and effort); when they did so, children in their classes were more likely to endorse fixed-minded beliefs and perform more poorly at the end of the school year (Park et al., 2016; see also Yu, Kreijkes, & Salmela-Aro, 2022). Similarly, research in higher education contexts has found that when college instructors explicitly communicate a growth (vs. fixed) mindset through their verbal behavior

(e.g., "everyone can learn statistics if they try") during general introductory remarks to their class, students shift their personal mindset beliefs toward more growth-minded beliefs about intelligence (e.g., Smith, Brumskill, Johnson, & Zimmer, 2018).

Taken together, this research demonstrates that mindset beliefs about intelligence are transmitted to children via interpersonal interactions with their parents and teachers. Extending this work, researchers became increasingly interested in exploring how mindset beliefs about intelligence and ability can be shifted in the context of adult interactions, such as in workplace contexts.

### 2.2.2 Workplace interactions

A substantial body of research has examined the role that mindset beliefs play in the workplace. As an individual difference, fixed (vs. growth) mindset beliefs have been associated with counterproductive workplace behavior, lower employee engagement, and poorer employee performance (Han & Stieha, 2020; Keating & Heslin, 2015; Li, Fan, & Leong, 2021; Zingoni & Corey, 2017). Other research has examined how *managers'* mindset beliefs shape employees' beliefs and outcomes. For example, Heslin and colleagues (2006) hypothesized that because growth (vs. fixed) mindset beliefs are associated with more prosocial behavior (Karafantis & Levy, 2004), such as people's willingness to provide helpful strategies and feedback to struggling peers (e.g., Heyman & Dweck, 1998), a manager who endorses more growth (vs. fixed) mindset beliefs might provide more effective coaching to their employees. In line with these hypotheses, managers' growth (vs. fixed) mindset beliefs were associated with more positive employees evaluations of their manager's coaching, including coaching behaviors such as helping the employee analyze their performance and facilitating creative thinking to help solve problems (Heslin, Vandewalle, & Latham, 2006).

Managers' mindsets also have been found to impact the feedback and performance appraisals they give to employees (Heslin & VandeWalle, 2008). Accurate performance appraisals are important because they help managers identify areas where an employee can improve their performance and where they, as a manager, can effectively support this improvement. For example, if managers fail to recognize employee growth or declines in performance, employees may exhibit greater frustration and less productive workplace behaviors that ultimately hurt the company's bottom line (Latham & Wexley, 1994). Heslin and colleagues (2005) explored the

relationship between managers' mindset beliefs and their evaluations of employees, by either measuring or manipulating managers' mindset beliefs about intelligence. Managers evaluated a hypothetical employee who first performed poorly (or well) on a task and then subsequently improved (or declined in) their performance on the same task. The researchers theorized that managers who held fixed-minded beliefs would be more likely to form quick, strong impressions of others that resist revising, even in the face of contradictory information; growth-minded managers, meanwhile, would be more likely to take a more dynamic and malleable view of behavior, and thus may be more open to reconsidering initial impressions in light of new information. Consistent with this theorizing, managers who endorsed more growth mindset beliefs made more accurate performance appraisals of the employee in either direction (i.e., more accurately recognizing the employee's improvement or decline in performance). In other words, managers who endorsed more growth (vs. fixed) mindset beliefs were more tuned to employees' performance and were thus able to make more accurate evaluations of that performance.

Early evidence also suggests that employee and manager mindset beliefs and behaviors can interact with each other. For example, Zingoni and Corey (2017) found that when managers had strong learning goal orientations, employees with more growth mindset beliefs had higher quality relationships with their manager, which, in turn, positively predicted their job performance.

## 2.3 Meso-level summary

Taken together, research that investigates the situational and interpersonal layer of mindset demonstrates that mindset is not just a stable individual difference (e.g., Dweck & Leggett, 1988; Dweck et al., 1995). Rather, we all have access to more fixed or growth mindset beliefs and different situations can shift us along the mindset continuum (Murphy & Reeves, 2019; Murphy, 2024). Interactions with important people—including those who raise us, teach us, and supervise us—can influence our mindset beliefs. Much more research is needed to understand how to shape these situations and interactions to support people's motivation and performance—a point to which we return later.

As a result of this work, new questions and challenges have emerged that suggest that there might be an even broader layer that influences our mindset meaning systems, beyond our situational and interpersonal contexts. For example, direct-to-student growth mindset interventions seem to

be especially effective in learning environments in which the norms align with the growth mindset message provided in the intervention (Yeager et al., 2019; Yeager et al., 2022; see also Hecht, Gosling et al., 2024), suggesting that the broader environment has important impacts on people's mindsets, motivation, and performance.

## 3. The macro-level: Mindset as culture

Just as people's individual mindsets can shift in response to local situations and interactions, so too do they exist within broader cultural systems. In a given setting, people must not only contend with the mindset beliefs of individuals around them, but also with the beliefs that are embedded in the cultural systems that affect how they are treated and evaluated. Recent research and theorizing asserts that mindset can exist as a cultural variable within groups, teams, institutions, and organizations (Emerson & Murphy, 2015; Murphy & Dweck, 2010; Murphy & Reeves, 2019; Murphy, 2024; Rattan & Ozgumus, 2019). *Mindset culture* refers to the collective orientation toward intelligence, talent, and ability within a given context, communicated explicitly or implicitly via messages from leaders, structures, policies, practices, and norms that shape people's experiences.

Like individual and interpersonal mindsets, fixed and growth mindset cultures exist on a continuum and many organizations and institutions are a mixture of the two (Murphy, 2024). On the one hand, contexts can communicate, encourage, and sometimes even enforce strong fixed-minded beliefs and behavior through norms, policies, and practices. These *Cultures of Genius* (Murphy & Dweck, 2010; Murphy, 2024) communicate that intelligence, talent, and ability are fixed traits and individuals are seen as either naturally talented and capable or not. In this mindset culture, the focus is primarily on star performers, or the resident geniuses—those who are judged inherently more capable due to perceptions about their superior intelligence or ability. On the other end of the mindset culture continuum, contexts can communicate, encourage, and enforce a strong *Culture of Growth*, grounded in the growth mindset belief that intelligence, talent, and ability can be developed through effort, learning, good strategies, persistence, and seeking help from others. In this mindset culture, people believe that everyone can develop and contribute—not just the resident geniuses. Fixed and growth mindset cultures are perceived not only by people inside an environment—such as students in a classroom or school, or workers within a

company—but also by people outside of it (such as potential members, competitors, and the general public) due to the public messages, behaviors, and other observable cultural artifacts that characterize these environments (e.g., Canning et al., 2020; Emerson & Murphy, 2015; Jones et al., 2024; Muenks et al., 2020; Murphy & Dweck, 2010; Williams, 2022).

How can we identify the mindset culture of important mainstream settings such as schools and workplaces? One influential theoretical framework for understanding the varied ways that mindset culture can manifest is organizational psychologist Edgar Schein's model of organizational culture (Schein, 1990, 1996, 2010). Schein's model identifies three layers of organizational culture that build on one another (and are often depicted as a triangle or a series of concentric circles): the foundational layer consists of an organization's *underlying assumptions and core beliefs*, the middle layer consists of its *espoused values,* and the top or outermost layer consists of the *artifacts and behavior* observable in the setting. Briefly, underlying assumptions and core beliefs are the deeply embedded, taken-for-granted beliefs that guide behavior within a group or institution such as beliefs about time or human nature. These beliefs are called core beliefs because they form the core of a group or institution's culture and dictate how members perceive themselves, the institution, and others within it—and these beliefs shape how people behave and respond to situations within the setting. Espoused values are the explicitly-stated values, goals, and strategies that a group or institution promotes. They include things like mission statements, values communicated by leadership, and an organization's strategic vision. Lastly, artifacts and behavior are the most tangible elements of a group or institution's culture, including cues in the physical environment, language, rituals, interpersonal behavior and norms, and formal organizational policies and structures. These are often the most visible aspects of culture, and they provide important clues about the deeper cultural layers. Notably, within settings, there can sometimes be a values-implementation gap between what is espoused and what actually happens in practice (i.e., artifacts and behaviors).

Within Schein's framework, mindset culture consists of fixed and growth mindset beliefs that form the group, organization, or institution's core beliefs and which, in turn, influence the group's values (prizing people's innate, superior ability vs. dedication, learning, and effort) as well as the artifacts (policies, practices) and behavior found and observed in the setting (Canning et al., 2020; Murphy & Reeves, 2019; Murphy, 2024). Fixed-minded Cultures of Genius communicate that only a limited number of "geniuses"

with "natural talent" can be successful and thus deserve the lion's share of opportunities and accolades. A belief in the inborn, fixed ability of individuals means that development supports and opportunities are unnecessary (because people are either talented and smart or they are not) and are thus devalued, and struggle is seen as a sign that one doesn't have what it takes to be successful. These mindset cultures value high, effortless, and flawless performance that can be used by leaders to identify who has the brilliance worthy of recruitment, recognition, or promotion. This mindset culture prioritizes performance goals in order to have members prove their abilities and it encourages interpersonal competition (people vie to be perceived as the most talented) while discouraging risk-taking or learning from mistakes and failure (Emerson & Murphy, 2015; Kroeper, Fried, & Murphy, 2022a; Kroeper, Muenks, Canning, & Murphy, 2022b; Murphy & Dweck, 2010; Murphy & Reeves, 2019; Murphy, 2024).

In contrast, Cultures of Growth communicate that everyone can make progress and ultimately succeed with the use of effective strategies, support from others, effort, and persistence. Here, feedback and growth opportunities are recognized as critical for improvement and mastery and are provided frequently to people in these contexts. Struggle and setbacks are considered a common and expected part of learning and growth and are valued for the insights that can be gleaned from them. Strong Cultures of Growth prioritize learning goals and encourage people to grow and develop their intelligence, skills, and abilities, often by learning from and collaborating with others, trying new strategies (or innovating), and engaging in measured risk-taking. Cultures of Growth also value people's motivation and willingness to develop; they provide learning opportunities and resources and encourage people to take advantage of them. Thus, in these settings, people are driven to showcase (and are often rewarded for) their dedication to development, improvement, and growth (Emerson & Murphy, 2015; Kroeper et al., 2022a, 2022b; Murphy & Dweck, 2010; Murphy & Reeves, 2019; Murphy, 2024). Table 1 provides some illustrative examples that contrast how mindset beliefs, values, and artifacts are signaled in strong Cultures of Growth or strong Cultures of Genius within a higher educational context.

Through this lens, researchers have studied how mindset cultures are communicated across these different layers, both through explicit and implicit messages, policies, practices, and norms (e.g., Hecht, Murphy et al., 2023; Jones et al., 2024; Kroeper et al., 2022a, 2022b; Murphy & Reeves, 2019; Murphy, Fryberg, Brady, Canning, & Hecht, 2021). For example, researchers

**Table 1** Illustrative examples contrasting how schein's model of organizational culture map onto cultures of growth and genius in a higher education context.

| Schein's layer of organizational culture | How the cultural layer can be signaled in a Strong culture of growth | How the cultural layer can be signaled in a Strong culture of genius |
|---|---|---|
| **Underlying Assumption/Core Belief:** *The deeply embedded, taken-for-granted beliefs and assumptions that guide values and behavior within a setting.* | Talent, intelligence and ability can be developed; people are capable of learning and growing (i.e., ability is not innate or fixed). | Talent, intelligence, and ability are fixed traits; people are either talented, intelligent, or good at something or they're not, and no amount of effort can change that. |
| **Espoused Values:** *The explicitly stated values, goals, and strategies that an organization promotes.* | The ***mission statement, president, or dean*** says, "We are committed to fostering a community where everyone is encouraged to explore, innovate, and grow. We believe in the transformative power of learning to expand minds, develop skills, and challenge boundaries …" | The ***mission statement, president, or dean*** says, "We are dedicated to maintaining our tradition of excellence by attracting the brightest minds and the most talented people. Our mission is to cultivate a community of people who demonstrate exceptional ability in their fields…" |
| **Artifacts/Behaviors:** *Most visible and tangible elements of an organization's culture, including its physical environment, behavioral norms, language, rituals, and formal structures.* | ***Orientation materials*** emphasize growth, learning from mistakes, seeking help when stuck, and perseverance through challenges. ***Grades*** are used as a *sorting* mechanism, to categorize students based on presumed fixed abilities and track them into distinct academic pathways. ***Academic warnings or evaluative feedback*** | ***Orientation materials*** emphasize the organization's history of attracting high-achieving people and the importance of maintaining a competitive edge. ***Grades*** are used as a *supporting* mechanism, to track students' learning progress and identify areas where students need additional support to |

*(continued)*

**Table 1** Illustrative examples contrasting how schein's model of organizational culture map onto cultures of growth and genius in a higher education context. (*cont'd*)

| Schein's layer of organizational culture | How the cultural layer can be signaled in a Strong culture of growth | How the cultural layer can be signaled in a Strong culture of genius |
|---|---|---|
| | share stories of prior members who encountered and overcame challenges by adopting specific good strategies, ultimately achieving learning and growth.<br>The ***norms*** are to seek intellectual challenges, get help when stuck, and persist in the face of adversity. | develop their skills.<br>***Academic warnings or evaluative feedback*** include strict reminders of requirements and emphasize that only those who consistently meet these expectations are suited to succeed (and will be retained).<br>The ***norms*** are to prioritize flawless performance, compete to showcase their intelligence, and avoid effort and challenges. |

have examined how mindset culture core beliefs influence people's goals, experiences, and performance when these beliefs are explicitly endorsed by or attributed to powerful people in the context, like teachers in a classroom (e.g., Canning, Ozier, Williams, AlRasheed, & Murphy, 2022; LaCosse, Murphy, Garcia, & Zirkel, 2021; Muenks et al., 2020), leaders in an organization (e.g., Emerson & Murphy, 2015; Williams, 2022), or the majority of people in a setting (e.g., Murphy & Dweck, 2010). Additionally, mindset cultures have been studied as espoused values communicated in organizational or institutional materials, like company mission statements (e.g., Canning et al., 2020; Emerson & Murphy, 2015) or classroom syllabi (Canning et al., 2022). In a recent study, Jones and colleagues (2024) investigated how core mindset beliefs can be embedded in key artifacts and processes of the human resources (HR) life cycle, including within job ads, standard application materials, interview questions, and performance evaluations. In the context of college classrooms, Kroeper and colleagues (2022a) asked students to categorize 119 instructional policies, practices, norms, and faculty messages (sourced from the research literature and student focus groups) based on whether they signal a

stronger fixed or growth mindset culture. Results revealed that students reached exceptionally high consensus for 96 of the 119 cues (more than 80 % of the teaching policies, practices, norms, and messages that were rated). Finally, these mindset culture cues can be perceived by those not yet in the context through public information and accessible artifacts—and these perceived mindset cultures influence people's anticipated psychological experiences and their interest in joining the context (e.g., Canning et al., 2020; Jones et al., 2024; LaCosse et al., 2021; Muenks et al., 2020). Thus, research indicates that mindset cultures are perceived by those that operate within and outside organizational contexts, communicated through a variety of verbal and non-verbal, explicit and implicit, and formal and informal cues. Because of the different ways that mindset culture beliefs can be communicated, research should continue to include diverse operationalizations of mindset culture across an array of contexts (Schein, 1996).

## 3.1 Mindset cultures shape people's goals, motivation, experiences, behavior and outcomes

Mindset cultures affect people's motivation and goals, their self-concept, and their behavior. Fixed- and growth-minded organizational beliefs influence how people within a setting perceive challenges, potential, and effort, how they self-present, and how they set goals (e.g., Bardach et al., 2024; Canning et al., 2020; Emerson & Murphy, 2015; LaCosse et al., 2021; Muenks et al., 2020; Murphy & Dweck, 2010). In one of the earliest investigations of mindset culture, Murphy and Dweck (2010) found that when the majority of people in an organization endorse more fixed-minded beliefs, newcomers adopt performance goals and highlight their awards and intellectual achievements in order to be admitted to the organization. Once admitted, people in these fixed-minded cultures come to see smarts and intelligence as more central to their self-concept, and when given an opportunity to hire others, they recreate and reinforce the organization's mindset culture by choosing applicants who embody the culture's fixed-minded beliefs and values. At the same time, when the majority of people in an organization endorse more growth-minded beliefs, potential newcomers adopt learning goals and highlight their motivation, persistence, and the challenges they have overcome in order to be admitted to the organization. Once admitted, people in these growth-minded cultures come to see learning and development as core to their self-concept, and when given an opportunity to hire others, these individuals also recreate and reinforce the mindset culture, this time choosing applicants who embody the culture's growth-minded beliefs

and values. Thus, people use an organization's mindset to discern what the organization values and behave in ways that are congruent with and recreate the organization's core beliefs (Murphy & Dweck, 2010).

Consistent with theory (Murphy & Reeves, 2019), experimental and field studies show that strong Cultures of Growth promote behavioral norms of collaboration, innovation, and integrity whereas Cultures of Genius promote norms of interpersonal competition, risk aversion, and unethical behavior (Canning et al., 2020; Emerson, 2015; Jones et al., 2024; Williams, 2022). Because Cultures of Growth believe that people can grow and develop—and provide the resources, strategies, and time for them to do so—they are perceived to be more supportive of their members and to treat people more fairly than fixed-mindset cultures (e.g., Jones et al., 2024; LaCosse et al., 2021).

Psychologically, mindset cultures play a crucial role in shaping people's experiences. Many studies (Canning, Muenks, Green, & Murphy, 2019; Canning et al., 2020; Canning et al., 2022; Canning, White, & Davis, 2024; Green, Theobald, Murphy, & Kroeper, 2024; Hecht, Latham, Buskirk, Hansen, & Yeager, 2022; Hecht, Bryan, & Yeager, 2023; Hecht, Buontempo, Boylan, Crosnoe, & Yeager, 2024; Hecht, Dweck, Murphy, Kroeper, & Yeager, 2023; Hecht, Gosling et al., 2024; Hecht, Murphy et al., 2023; Jones et al., 2024; Kroeper, Gopalan, Emerson, & Walton, 2025a; Kroeper, Hildebrand et al., 2025b; LaCosse et al., 2021; Muenks et al., 2020; Murphy & Dweck, 2010; Williams, 2022) have demonstrated that people experience a greater sense of belonging in Cultures of Growth compared to fixed-minded Cultures of Genius. Additionally, people experience fewer evaluative concerns, less imposter feelings, and lower negative affect in growth (vs. fixed) mindset cultures (Kroeper et al., 2025b; LaCosse et al., 2021; Muenks et al., 2020; Williams, 2022). Looking across multiple timepoints, a recent study found that the relationship between fixed mindset culture beliefs and psychological distress (e.g., lower belonging, higher evaluative concern, etc.) is mutually reinforcing. Specifically, when students perceived fixed-minded cultural beliefs early in the semester, they reported greater psychological distress later on; moreover, psychological distress can lead to even stronger perceptions of fixed-minded cultural beliefs later (because the greater psychological distress leads to enhanced threat detection; Kroeper et al., 2025b).

Generally, people find Cultures of Growth more attractive and appealing than fixed mindset cultures, and they express more interest in being a part of them (Jones et al., 2024; LaCosse et al., 2021; Muenks et al., 2020;

Murphy & Dweck, 2010). Companies espousing more growth-minded beliefs engender greater organizational trust, commitment, and job satisfaction, in both experimental and field studies (Canning et al., 2020; Emerson & Murphy, 2015; Jones et al., 2024; Williams, 2022). Motivation and persistence are also higher in Cultures of Growth, including greater developmental willingness and behavioral engagement (Emerson & Murphy, 2015; Jones et al., 2024; Williams, 2022).

Finally, mindset cultures impact people's behavior, performance, and outcomes. As described above, Murphy and Dweck (2010) found that people self-present the behaviors (i.e., the performance and achievement vs. motivation and growth) they deem valued by an organization, based on its mindset culture. Mindset cultures also impact people's success in that environment. Muenks and colleagues (2020) found that college students reported lower effort, greater drop out intentions, and performed more poorly in classes taught by professors they perceived to be more fixed- (vs. -growth) minded. Similarly, when college faculty *actually* endorse more fixed (vs. growth) mindset beliefs via self-report, college students perform worse in their classes (Canning et al., 2019). Fixed-minded Cultures of Genius are also associated with greater turnover in workplace settings as well as lower anticipated and actual performance (e.g., Canning et al., 2020; Emerson & Murphy, 2015; Jones et al., 2024; Williams, 2022). In sum, evidence suggests that mindset cultures impact important perceptions, experiences, and outcomes for people as they operate in the groups, institutions, and organizations that surround them.

### 3.1.1 Potential confounds? The role of warmth and competence

One alternative hypothesis offered for mindset culture effects has been that they simply reflect the warmth and competence of the organization and its members and not the fixed- and growth-mindset beliefs that are core to these cultures. For example, the stereotype content model (SCM; Fiske, Cuddy, Glick, & Xu, 2002) suggests that people seek to determine whether others' intentions are good or bad (i.e., the warmth dimension of social perception) and whether they are capable of acting on those intentions (i.e., the competence dimension of social perception). Thus, warmth and competence are core dimensions of social perception (e.g., Fiske, Cuddy, & Glick, 2007; Fiske, 2018), including how organizations are perceived (e.g., Cuddy, Glick, & Beninger, 2011). Thus, it is possible that growth-minded beliefs and practices—which center people's ability to develop—are perceived as warmer; in contrast fixed-minded beliefs and

practices—with their emphasis on demonstrating effortless, high performance—could be perceived as colder but more competent. Several studies that have experimentally manipulated organizational mindset culture cues (for example, in a teacher's first-day-of-class speech or a company's mission statement) have contended with this hypothesis by dissociating these constructs in several ways in order to examine mindset culture independently from these other constructs. For example, researchers have developed experimental stimuli that clearly differ along the fixed-growth mindset dimension but are rated as similarly warm and competent in pilot studies, thereby obviating the possibility of these confounds. Other field and experimental studies have included measures of perceived warmth and competence as analytic covariates, controlling for the role of these potential confounds while investigating the role of mindset culture. Consistently across these studies, mindset culture effects emerge above and beyond perceptions of warmth and competence (Emerson & Murphy, 2015; Hecht, Dweck et al., 2023; Jones et al., 2024; Kroeper et al., 2022a; LaCosse et al., 2021; Muenks et al., 2020; Williams, 2022). Of course, this is not to say that growth mindset cultures—with their emphasis on people's potential and tangible support for people's development—are not actually experienced as warmer and more supportive than fixed-minded cultures—where people are required to demonstrate their intelligence. Indeed, this would make a lot of sense. In fact, we would argue that this is a feature of growth mindset cultures (and not a bug). However, when it comes to competence, people appear to be more competent in growth mindset cultures (where they perform better), and growth-minded organizations tend to achieve their strategic and financial goals more than fixed-minded organizations (e.g., Canning et al., 2019; Muenks et al., 2020; Murphy, 2024).

In the most direct test of these questions to date, White and colleagues (2024) experimentally manipulated and fully crossed mindset beliefs and warmth by exposing students to a professor who espoused fixed or growth mindset beliefs while displaying a warm or cold demeanor. Results revealed that students anticipated the most positive experiences (greater sense of belonging, less evaluative concern, and lower imposter feelings), greatest motivation (greater effort) and best outcomes (higher grades) when they encountered a professor with a warm demeanor *and* who endorsed growth mindset beliefs. However, students preferred a growth-minded professor to a fixed-minded one, regardless of whether the instructor had a warm or cold demeanor (White, Olson, & Canning, 2024).

Taken together, these different methodological approaches suggest that mindset culture effects are robust and independent from warmth and competence perceptions.

## 3.2 Mindset culture as context for stereotype and social identity threat

Mindset culture plays a particularly important role in shaping the experiences and outcomes of people who belong to groups whose intelligence, talent, or ability are impugned by widely held societal stereotypes. Fixed-minded Cultures of Genius communicate that *only some people* are capable of possessing the innate and natural talent, intelligence, and ability necessary to succeed. For members of groups whose abilities are negatively stereotyped or who do not match the cultural prototype of success, fixed-minded environments are likely to engender social identity threat and stereotype threat, causing people to worry about being disrespected, devalued, excluded, or viewed through the lens of negative stereotypes about one's group (Steele, 1997; Steele et al., 2002).

How would we know whether fixed mindset cultures create a context of stereotype threat? We should expect to observe similar effects as we do in the stereotype and social identity threat literatures, such that people who belong to groups that are negatively stereotyped along the dimensions of ability and intelligence (e.g., Black, Latinx, Indigenous people; lower-income people; first-generation college students; and women in some STEM disciplines) have more negative psychological experiences and underperform relative to their peers who belong to groups that are positively stereotyped along these ability dimensions (e.g., White and Asian men, higher-income people, and continuing-generation college students)—and we should observe these disparate effects much more so in fixed mindset cultures and much less so in growth mindset cultures.

Canning and colleagues (2019) tested this stereotype threat hypothesis directly in an institution-wide study that measured 150 faculty member's self-reported mindset beliefs and then longitudinally examined the performance of students in these fixed- and growth-minded learning environments, analyzing the academic performance of more than 15,000 college students across seven semesters. Consistent with the hypothesis that fixed mindset cultures depress performance, students on average performed worse in classes taught by faculty who endorsed more fixed (vs. growth) mindset beliefs. Moreover, consistent with a stereotype threat hypothesis, classes taught by professors who endorsed more fixed

mindset beliefs had racialized achievement gaps that were twice as large as those observed in classes taught by professors who endorsed more growth mindset beliefs. Interestingly, several faculty characteristics—including faculty's gender, race/ethnicity, age, tenure status, and teaching experience—did not predict faculty's mindset beliefs. Thus, in this study, male and female faculty; White and non-White faculty; younger and older faculty; tenured and untenured faculty; and faculty with more vs. less teaching experience were similarly likely to endorse growth mindset beliefs. Moreover, these faculty personal characteristics did not buffer racial and ethnically minoritized students against the negative effects of fixed faculty mindset beliefs.

Studies of mindset culture have illuminated several other patterns of experience and outcomes consistent with social identity threat theory (Murphy & Taylor, 2012; Murphy et al., 2024; Steele, Spencer, & Aronson, 2002). For example, LaCosse & colleagues (2021, Studies 2 and 3) found that when students perceived a STEM course professor to endorse more fixed- (vs. growth-) minded beliefs—conveyed through a first-day-of-class speech—students reported more negative psychological experiences (e.g., lower sense of belonging, greater evaluative concerns, more concern about unfair treatment), which in turn led to lower interest in that course and other courses taught by that professor. However, the negative effect of the professor's fixed mindset beliefs on students' experiences was 22 % to 74 % larger fro women compared to men–a pattern consistent with social identity threat theory, which posits that negative stereotypes impugning the ability of women in STEM (e.g., Nosek, Banaji, & Greenwald, 2002) should undermine women's experiences in identity-threatening contexts. These gender differences in experience and outcomes have been demonstrated in both lab and longitudinal studies in STEM contexts (e.g., Bian, Leslie, Murphy, & Cimpian, 2018; Canning et al., 2022; Muradoglu, Horne, Hammond, Leslie, & Cimpian, 2022). Moreover, similar effects have been found for other social groups impugned by negative ability stereotypes, including first generation college students relative to their continuing generation peers (Canning et al., 2024).

The threatening effects of fixed-minded cultures are also not limited to STEM and academic contexts. Consistent with negative stereotypes about women's competence in business (Eagly & Mladinic, 1994; Fiske et al., 2002), another study found that women—more so than men—trusted a company that espoused more fixed-minded beliefs less than a company that espoused more growth-minded beliefs because they expected to be perceived as less

competent by those in the fixed mindset company. This mistrust, in turn, led women to disengage more than men before interacting with a company representative (Emerson & Murphy, 2015). In another study, Han and colleagues (Han, Belmi, Thomas-Hunt, & Summers, 2024) found that employees from working class backgrounds that self-reported working in a "white-collar environment" reported a greater sense of belonging at work when they perceived that their managers endorse more growth mindset beliefs about intelligence. This effect was driven by employees' reduced expectations of experiencing social identity threat (due to their working-class backgrounds) in the workplace.

The long-reaching impact of mindset cultures may also help explain structural inequities observed in many fields and industries. In a nationwide survey of academics across a spectrum of disciplines, researchers found that in fields (like math and philosophy) that were perceived to endorse more fixed-minded beliefs about talent and ability, both women and Black students were underrepresented among Ph.D. students (Leslie, Cimpian, Meyer, & Freeland, 2015; Meyer, Cimpian, & Leslie, 2015). Of course, we cannot draw causal inferences from such a correlational study; however, social identity and stereotype threat theory (Murphy & Taylor, 2012; Steele et al., 2002) predict that potential graduate students from underrepresented groups might avoid fields where the mindset cultures (and powerful people within them) impugn their group's talents and abilities and thus where they may be discriminated against. Supporting this, studies show that women are less interested in educational and professional opportunities in fields that link success to brilliance, anticipating that group-based stereotypes about who has (or lacks) "raw, innate talent" may lead others to see them and their group as lacking the brilliance deemed necessary for success (e.g., Bian et al. 2018; Emerson & Murphy, 2015; LaCosse et al., 2021). Indeed, other research finds that when a job is framed as requiring "natural intelligence," people are less likely to refer women for the position (Bian, Leslie, & Cimpian, 2018), suggesting that women's hesitations about entering such fields may be well-founded.[1] Together, these findings highlight the impact

[1] Another possibility involves a different form of self-selection: potential graduate students may be attracted to (or repelled by) fields whose mindset cultures match (or mismatch) their personal beliefs. This hypothesis presumes that women and people from racially minoritized groups disproportionately hold growth-minded beliefs and, to the extent that they do not join certain fields (for myriad reasons, including lack of interest or ability, as well as discrimination), they subsequently "take their growth mindsets with them" to other fields. However, no evidence of which we are aware suggests that mindset beliefs systematically vary by gender and race, making this explanation unlikely.

that mindset cultures may have on the educational and career trajectories of people from negatively stereotyped and structurally disadvantaged groups and suggest fruitful avenues for future research.

## 3.3 Where do mindset culture messages come from?

### 3.3.1 Powerful people in a setting

People in positions of power—from teachers, staff, and administrators in educational environments, to company leaders, managers, and CEOs in workplace settings—are seen to represent organizations and institutions. When these powerful individuals communicate mindset beliefs, they can play a crucial role in shaping the real and perceived organizational culture, motivating (or demotivating) employees, and influencing behavior and performance. The mindsets that these individuals communicate—whether fixed or growth—provides information to others about *what* success looks like in that environment, *how* to achieve that success, and *who* can be successful there. One set of studies directly tested this "powerful person" theory, exposing people to the mindset beliefs of either a company's CEO (arguably the most powerful person in the company), a manager (a moderately powerful person in the company), or a newly hired employee (a much less powerful person in the company). Results revealed that the CEO's beliefs (followed by the manager's beliefs, and *not* the beliefs of the new hire) had the strongest impact on people's perceptions of the organization's mindset and the company's norms and values (e.g., the value of competition vs. collaboration, the company's emphasis on integrity and ethics; Williams, 2022). These perceived beliefs also influenced people's anticipated experiences (e.g., sense of belonging, evaluative concerns), motivation (e.g., engagement) and outcomes (e.g., performance) in the company (Williams, 2022).

### 3.3.2 Policies, practices, and procedures

Powerful individuals also create the mindset culture of settings by establishing policies, practices, and procedures that can be enacted by others and persist even after the leader leaves. In companies, these policies and procedures can become deeply embedded in organizational structure and operations, often through HR processes. Once these policies are established, they are routinely executed by others, including lower-level employees. For example, processes that communicate mindset beliefs about intelligence and ability, such as certain interview questions or performance evaluation criteria, become "standard practices" that are implemented by HR personnel and can persist even when the original employees or leaders change (Jones et al., 2024).

To understand how practices and policies can communicate a fixed or growth mindset culture, consider the role of grades and assessments—what they mean and what they are used for—in educational settings (Airasian, 1994; Gronlund & Linn, 1990; Guskey, 2015; Hooper & Cowell, 2014). For example, some schools use grades and infrequent, high stakes assessments (e.g., placement tests, standardized achievement tests) as a *sorting* mechanism, categorizing students based on presumed fixed abilities and tracking them into distinct academic pathways, such as college-preparatory or vocational education, with little opportunity for students (or their parents) to appeal or switch tracks. Others use grades and more frequent, lower stakes formative assessments as a *supporting* mechanism; that is, as a means to track students' learning progress and identify areas where students need additional support to develop their skills (Morton & Van Cleave, 2020).

The *sorting approach* reinforces a fixed mindset culture, framing ability as an unchangeable trait, while the *supporting approach* promotes a growth mindset culture by positioning grades as a tool for learning and development. Such structures can shape teaching practices in ways that exacerbate (or reduce) educational disparities. For example, teachers often set lower expectations for students in lower tracks, provide them with less challenging coursework, and restrict access to advanced learning opportunities (e.g., Boaler, Wiliam, & Brown, 2000; Sun, 2019; Yu et al., 2022); thus, the use of grades to sort students based on presumed "natural abilities" may set some students on an irreversible path toward lower achievement and success. Once established, these systems can persist beyond an administrator's tenure, continually enacted and re-enacted by future school leaders for years or even decades.

Consistent with these ideas, recent research has found that teacher candidates with stronger growth mindset beliefs were more likely to also report that they use assessment as a learning tool, defined as focusing on student learning by "providing feedback or experiences that foster students' metacognitive abilities and learning skills (e.g., self-assessment, goal-setting, learning plans)" in a way that is primarily student-centered (as opposed to instructor-directed) (DeLuca, Coombs, & LaPointe-McEwan, 2019). In another study, middle schools were identified based on their grading model policies. Some schools used more growth-minded grading policies—in this case, standards-based grading models that assess students' progress towards mastery of specific learning objectives, provide students with opportunities to demonstrate their learning (such as revisions and retakes), and structure final grades to allow for recovery from early struggle and more accurately

represent students' mastery. Other schools used more fixed-minded grading policies—traditional grading models that rely more heavily on comparison between students and employ omnibus grading that incorporates all elements of student performance (including early struggles) and can obscure current mastery of the material. Students who attended schools with growth-minded, standards-based grading models (vs. fixed-minded, traditional grading models) were more likely to personally endorse a growth mindset themselves, use more effort-based strategies in math (e.g., asking clarifying questions or for help from an adult), and use more mastery (vs. performance) goal-setting (Franklin, 2016).

#### 3.3.3 Peer effects

Cultural mindsets are also shaped by peers (e.g., LaCosse et al., 2021; Muenks & Yan, 2024; Muenks, Yan, & Telang, 2021; Yeager et al., 2019). For example, LaCosse & colleagues (2021; Study 1) found that when college students anticipate enrolling in a new class, they form expectations about the mindset culture of that class by looking to the perceptions of prior students in that course. Other studies have found that peers can reinforce or challenge mindset beliefs through both explicit messages and through their behavior. When their peers convey messages explicitly or behave in ways that reinforce growth-minded beliefs—like demonstrating effort, helping others, or seeking out challenging work—students report more positive classroom experiences and attain higher achievement (e.g., Carroll et al., 2023; Hecht et al., 2022; Muenks & Yan, 2024). This research is consistent with literature demonstrating the complex interplay of the beliefs and behaviors of teacher and student peers on students' perception of classroom culture, their motivation, and their performance (Audley & Jović, 2020; Kilday & Ryan, 2022; Wentzel & Muenks, 2016).

### 3.4 Mindset macro- and microcultures

Many organizational and institutional settings—such as school districts that consist of many schools that themselves contain many different teachers and classrooms, or large organizations that have many teams and divisions—are complex entities made up of various, and sometimes conflicting, cultural layers. These contexts can have a broad, system-wide *macroculture*, which is reflected in the organization's core beliefs and values, communication from top leadership, and organization-wide policies and practices. However, within these larger institutions, there are often numerous *microcultures* that emerge in specific classrooms, teams, workgroups, or departments. These

microcultures are shaped by the leaders of these local contexts and the daily interactions between people within them (Alvesson, 2002; Kunda, 2006; Martin, 2002; Sackmann, 1992; Schein, 1990; Trice & Beyer, 2002). Notably, smaller microcultures that exist in organizations do not always align with the broader macroculture and can even contradict it. For example, several teams or divisions may embrace a growth mindset microculture even within a larger organization that endorses a fixed mindset macroculture (Murphy & Reeves, 2019).

Recent research has shown that individuals are skilled at recognizing and distinguishing between macroculture and microculture mindset cues within an organization (Williams, 2022). In a set of studies, when people overheard conversations in which the CEO expressed growth- (vs. fixed-) minded beliefs, they anticipated more positive company-wide norms, greater belonging, and reduced evaluative pressure, leading to increased organizational trust and commitment. However, when a middle manager (in charge of a local workgroup) expressed growth-minded beliefs, people anticipated better *workgroup-specific* norms and experiences (Williams, 2022). These results highlight that understanding how mindset culture affects peoples' experiences and outcomes in a context requires consideration of both broader organizational and smaller, team- and group-level dynamics. Of course, much more work is needed to examine the implications and interactions of these levels of mindset culture within organizations.

## 3.5 Interactions between mindset culture and people's personal mindset beliefs

Given the prevalence of research on people's personal mindset beliefs and interventions designed to foster stronger growth-minded beliefs in individuals (e.g., Dweck & Yeager, 2019; Paunesku et al., 2015; Yeager et al., 2016a, 2016b; Yeager et al., 2019), researchers have begun to explore the relationship between individuals' personal mindset beliefs and the surrounding mindset culture. This research has focused on (a) the extent to which people's personal mindset beliefs drive *perceptions* of mindset culture, (b) whether people's personal mindsets affect the *impact* of mindset culture, and (c) the role of mindset culture in the effectiveness of individual-focused mindset interventions.

First, some may wonder whether people's perceptions of an organization's mindset culture are driven by their own personal mindset beliefs. That is, to what extent do people's personal beliefs about intelligence and ability

shape how they view the organization's mindset? Canning and colleagues (2020) explored this question by examining the extent to which employee's personal mindset beliefs accounted for variance in their perceptions of their company's core mindset beliefs. Results revealed that employees' personal mindset beliefs accounted for only 14 % of the variance in perceived organizational mindset, suggesting that employees' personal beliefs and their perceptions of their company's beliefs are relatively distinct (Canning et al., 2020). These findings also are consistent with the broader person-culture fit literature, which consistently demonstrates that people are able to distinguish and compare their own beliefs, values, and goals to the beliefs, values, and goals of a particular group or organization (e.g., Cable & Judge, 1996; Kristof, 1996; O'Reilly, Chatman, & Caldwell, 1991).

Second, other research has assessed the extent to which people's perceptions of mindset culture impact their experiences and outcomes, above and beyond their own personal mindset beliefs. Even when personal mindset is included as an analytic covariate, perceptions of mindset culture consistently predict people's experiences and outcomes, including the extent to which they feel they belong there, trust the organization and its leaders, perform well, and show sustained interest in the company or field (e.g., Canning, et al., 2020, 2022; Kroeper et al., 2022a, 2022b, 2025a; LaCosse et al., 2021; Muenks et al., 2020; Williams, 2022). Thus, people's personal mindset beliefs do not appear to account for the *impact* of organizational mindset culture on people's experiences and outcomes.

Finally, some research has explored how fixed and growth mindset cultures may moderate the positive impact of personally endorsing growth mindset beliefs, including the effectiveness of popular interventions designed to shift people's personal beliefs about intelligence (e.g., Bryan, Hecht, Blazar, Kraft, & Solheim, 2021; Hecht, Yeager, Dweck, & Murphy, 2021; Hecht, Bryan et al., 2023; Hecht, Buontempo et al., 2024). In one example, an analysis of over 9,000 student records matched to over 200 math teachers revealed that teachers' self-reported mindset beliefs moderated the motivation and performance effects of a nationally representative direct-to-student growth mindset intervention administered to their students (Yeager et al., 2022). Specifically, students' grades and advanced math course-taking were only improved when students received the growth mindset intervention *and* when their teacher also endorsed growth-minded beliefs. When teachers endorsed more fixed-minded beliefs, the impact of the direct-to-student mindset intervention was not statistically significant (Yeager et al., 2022). This work suggests that there are some contexts in which people may not be

able to use or benefit from their (in this case, newly-acquired) growth mindset beliefs and that the most optimal context for motivation and performance is where a growth mindset culture supports the growth mindset beliefs of individuals within it.

Why do teacher's beliefs impact the effectiveness of direct-to-student mindset interventions? In their review, Hecht and colleagues (2023c) highlighted that teachers can shape the effectiveness of growth mindset interventions through both explicit messages about mindset (e.g., telling students that they can learn and succeed), as well as through the use of classroom policies, practices, and norms that provide opportunities for students to learn and improve (e.g., allowing students to revise and resubmit their work, grading policies that recognize incremental learning). In fact, mindset culture theory and research has identified several policies, practices, and messages that signal to college students that their instructor endorses more growth (relative to fixed) mindset beliefs, (e.g., Kroeper et al., 2022a, 2022b; Muenks, Kroeper, Canning, & Murphy, 2024a; several policies, practices, and messages are described in more detail below). Although this research is relatively new, evidence is building to suggest that the most effective efforts to support people's motivation, engagement, achievement, and persistence will need to consider the role of culture-level mindset beliefs, messages, and practices (e.g., Canning & Limeri, 2023; Hecht et al., 2021; Hecht, Murphy et al., 2023; Yeager et al., 2022).

## 4. A Mindset culture model: Supporting culture creators to build growth-minded cultures

Given the importance of mindset cultures for the motivation, learning, and performance of those within them, how can culture creators (such as teachers or managers) build growth-minded cultures? We are only at the beginning of understanding how to help people create these Cultures of Growth. Research and theory suggest that a first step may be in recognizing the complex way in which cultures are created and sustained (see Fig. 2; Murphy et al., 2021). Within a local learning or working environment, culture creators (such as teachers or managers) may personally endorse particular mindset beliefs about the nature of intelligence, talent, and ability—and in leading their classrooms, teams, and organizations, their intention is to enact and inspire behavior that aligns with those personal beliefs (i.e., the *intended culture*). However, this intended culture

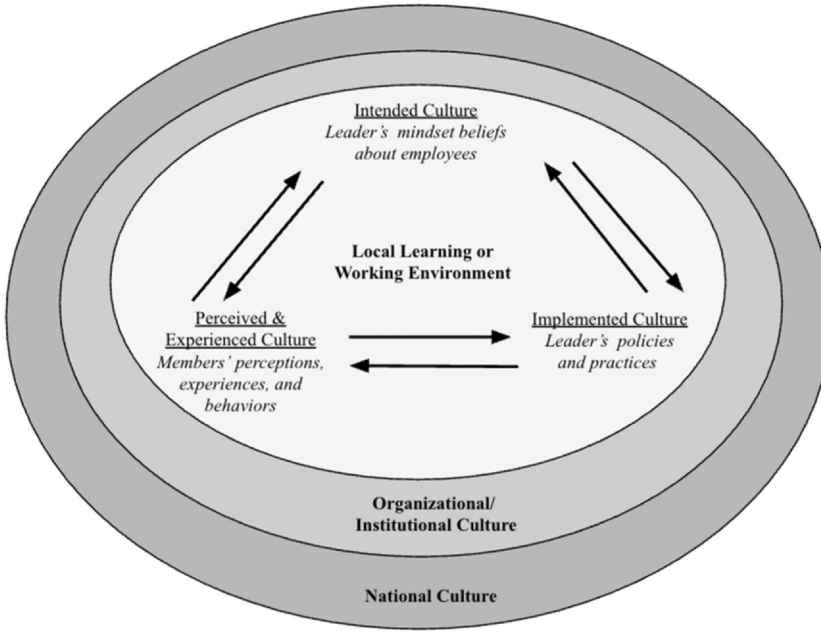


**Fig. 2** Growth mindset culture comprises leaders' intentions, implementation, and members' perceptions and experiences. *Adapted with Permission from Murphy et al. (2021).*

can differ from culture creators' *implemented culture*, or the policies, practices, norms and leadership messages that they actually use in their classroom or team environment (e.g., Muenks et al., 2024a; Muenks, Sievers, Kroeper, & Canning, 2024b; Sun, 2019).

There are likely several reasons for gaps between a leader's intended and implemented culture. For example, this value-implementation gap might reflect a misunderstanding about what a true growth mindset is (e.g., Barger, Xiong, & Ferster, 2022; Dweck & Yeager, 2019; Dweck, 2016a, 2016b; Fensterwald, 2015; common misconceptions described in more detail below). Or, leaders might lack experience or knowledge about which practices, policies, norms, and leadership messages are actually effective in communicating their mindset beliefs to others. Finally, even if they know *what* to do, it is possible that leaders lack understanding and practice regarding how to effectively implement those values-aligned practices in ways that are consistent and authentic to their own style so that the environment they create is consistently and authentically experienced as growth-oriented. These possibilities ground a third, critical part of

mindset culture: the *perceived culture*, or how the implemented policies, practices, and messages are viewed and experienced by those in the context (e.g., students or employees; Murphy et al., 2021).

To date, much research has focused on the how culture creators' beliefs (i.e., the intended culture) directly impact people's experiences and outcomes in an environment (e.g., Canning et al., 2019; Haimovitz & Dweck, 2017; Heyder & Brunner, 2018; Heyder, Weidinger, Cimpian, & Steinmayr, 2020; LaCosse et al., 2021; Muenks et al., 2021; Muenks, et al., 2020; Rattan et al., 2018; Sun, 2018; Yeager et al., 2022). Yet, other research shows that perceived culture is often most predictive of students' or employees' experiences and outcomes—and is generally more closely associated to the culture creator's implemented, rather than their intended, culture (e.g., Campbell, Craig, & Collier-Reed, 2020; Hecht, Dweck et al., 2023; Hecht, Murphy et al., 2023; Kroeper et al., 2022a, 2022b; Muenks et al., 2020; Muenks et al., 2024a, 2024b; Rattan, Good, & Dweck, 2012). In other words, how people perceive an environment is more connected to what their manager or teacher says and does than to what their manager or teacher personally believes, a pattern that is consistent with Schein's organizational culture model (Schein, 1990, 1996, 2010).

Although the intended culture may not always perfectly align with the implemented culture (Muenks et al., 2024b), some degree of relationship exists. For example, teachers who endorse stronger growth mindset beliefs about ability and intelligence tend to use instructional practices that value and support students' learning, such as using formative assessment to track mastery and identify learning challenges, allowing students to revise work to demonstrate growth in learning, or normalizing challenges and encouraging learning from mistakes (Muenks, et al., 2020: Rissanen, Laine, Puusepp, Kuusisto, & Tirri, 2021; Yeager et al., 2022). Research suggests that students use these behaviors as cues to their instructors' mindset, which in turn shapes students' sense of belonging, self-efficacy, and motivation, and predicts their behavioral engagement, persistence, and performance (e.g., Canning et al., 2019; Canning et al., 2022; LaCosse et al., 2021; Muenks et al., 2020). These findings suggest that interventions that target the *behavior* of culture creators, like providing training on how to enrich existing lessons with growth mindset feedback, may be particularly fruitful ways to build growth-minded culture (e.g., Hecht et al., 2021; Hecht, Dweck et al., 2023; Hecht, Murphy et al., 2023; Muenks et al., 2024a; Murphy et al., 2021; Zeeb, Ostertag, & Renkl, 2020). Of course, this model of mindset cultures can inspire many additional questions and avenues for future research, a point to which we return below.

## 5. The future of mindset research

Taken together, we have characterized decades of mindset research into three primary foci: the micro- (individual difference) level, the meso- (interpersonal/situational) level, and the macro- (mindset culture) level. Briefly, much of the research at the micro-level treats mindsets about intelligence as a relatively stable meaning system with important consequences for people's goals, motivation, behavior, and performance (for reviews, see Dweck & Leggett, 1988; Dweck & Sorich, 1999). At the meso-level, research examines how common and predictable situations and interpersonal interactions shift people between their fixed and growth mindset (Blackwell et al., 2007; Cimpian et al., 2007; Gunderson et al., 2013; Haimovitz & Dweck, 2016; Heslin, Latham, & VandeWalle, 2005; Heslin et al. 2006; Kamins & Dweck, 1999; Paunesku et al., 2015; Pomerantz & Kempner, 2013; Yeager et al., 2016a; Yeager et al., 2019). Finally, at the macro-level, research recognized that interpersonal interactions and situations do not happen in a vacuum but instead occur in a broader cultural context. This research examines how mindset can exist as a cultural variable within groups, teams, institutions, organizations communicated via explicit and implicit policies, practices, norms, and leadership messages (Hecht, Murphy et al., 2023; Jones et al., 2024; Murphy & Reeves, 2019; Murphy et al., 2021) and that these fixed and growth mindset cultures have meaningful consequences for people's perceptions of themselves, others, and their organization, as well as for their psychological experiences, behavior, and outcomes within a setting (Murphy, 2024).

So, what might the future of mindset research look like? In some ways, we are just at the beginning of understanding the complexity of mindset and how it shapes people's experiences and outcomes across levels. Further research is certainly needed to continue to map the interplay between mindset culture, interpersonal dynamics, and people's personal mindset beliefs. For example, following our mindset culture model described above, it remains an open question as to whether leaders (teachers, managers) must endorse strong growth mindset beliefs in order to implement a strong growth mindset culture that is perceived and experienced by members (students, employees) as such. It is possible that growth-minded policies, practices, and behavior may be perceived as more authentic when accompanied by strong growth mindset beliefs on the part of the leader or implementer. However, research and theory on cognitive dissonance (Festinger, 1957; Harmon-Jones, 2019) also suggests circumstances where

behavior can proceed belief—and that enacting growth-minded policies, practices, and behavior may cause leaders to adopt more growth-minded beliefs, especially when they witness the impact of their growth-minded behavior on students' and employees' motivation, goals, and behavior. Are mindset culture interventions that most effectively and positively impact the beliefs, goals, and behavior of its members those that target leaders' beliefs, leaders' behavior, or both? How do individuals without positions of power (students, employees) shape and contribute to the mindset culture in their environments? These are all fascinating open questions that we are thrilled for the research community to explore.

There is also much more to learn about how to optimize individual-focused mindset interventions. For example, although previous research has demonstrated that individual-focused growth mindset interventions aimed to shift people's personal mindset beliefs and meaning systems are more impactful when paired with consistent mindset cultures (e.g., Bryan, Hecht et al., 2021; Hecht et al., 2021; Hecht, Bryan et al., 2023; Hecht, Buontempo et al., 2024; Jia, Lim, Ismail, & Tan, 2021), much more research is needed to uncover the interpersonal processes and behaviors that explain and mediate these changes. For example, managers in organizations that endorse more growth mindset beliefs might be more willing to coach their employees (Heslin et al., 2006), and in doing so unleash employees' growth-minded beliefs, goals, and behavior. Similarly, teachers might be more likely to use mastery-oriented instructional practices (such as allowing students to revise their work and providing formative assessment to track and respond to students' learning) in educational institutions that reward the instructors for doing so (Kroeper et al., 2022a, 2022b; Yeager et al., 2022). It is also possible that an employee might be more willing to view critical feedback as an opportunity to learn and develop in organizations that include assessments of employees' learning from feedback as part of the standard performance evaluation process. Future research is needed to examine these possibilities.

The macro-level of mindset research has primarily focused on how mindset culture can shape the motivation, goals, and behavior of people within groups, teams, institutions, organizations. However, there are still many open questions about the interplay of personal, situational, and cultural mindsets outside the domain of intervention. For example, what happens when people are in mindset mismatched environments—that is, when people are enacting certain mindset-consistent behaviors because of cultural norms that don't necessarily conform to their personal beliefs?

Imagine a more growth-minded individual within a more fixed-minded culture. In these cases, can people hold on to their beliefs (belief persistence)? Or are they changed over time by the culture and their behavior via cognitive dissonance mechanisms or other processes? In a series of experiments, Wallace and colleagues (2023) found that organizational growth mindsets primarily increased belonging and interest in joining the organization among people whose personal growth mindset beliefs matched the organization. A field study replicated this pattern among students in their college classrooms; however, an interesting pattern emerged for students' grades: rather than bolstering the (already higher) grades of students with strong personal growth mindset beliefs, growth mindset classroom contexts primarily enhanced the grades of students who endorsed more fixed mindset beliefs (Wallace et al., 2023). More research like this that illuminates for whom, how, and on which outcomes different mindset cultures are most beneficial will provide needed theoretical and practical insight into how to build environments that support people's experiences and outcomes.

Finally, it is important to recognize that the mindset cultures of groups, teams, institutions, and organizations are also embedded within broader societal and national cultures (see Markus & Kitayama, 2010 for a compelling model of how other cultural core beliefs come to shape—and are shaped by—institutions, interactions, and individual psychology). As such, we have a lot more to learn about how the ideas, values and norms of a society with certain national cultural attributes shape its organizations' and citizens' mindset beliefs and impact interpersonal interactions, policies, and practices within them. Some research has started to investigate these questions. For example, Jia and colleagues (2021) found that country-level indicators of educational mobility (the proportion of children from low-education households who graduate from tertiary education) influenced the relationship between students' growth mindset beliefs and their performance. Specifically, they found that countries with lower educational mobility showed weaker relationships between students' growth mindsets and their performance, whereas in high-mobility countries where it is more possible to advance academically, students' growth mindsets were more strongly predictive of their performance (Jia et al., 2021). These findings suggest that there are many societal and national culture factors that may influence the mindset culture and shape the affordances provided to groups and individuals to grow and develop. These factors are likely to impact the development and effectiveness of people's growth mindset meaning

systems, including their beliefs, goals, and behavior. It is exciting to consider the ways in which these broader cultural frameworks might shape future mindset research.

## 5.1 Challenges to mindset that inform future research

Mindset research, like all influential programs of research, has encountered puzzles and challenges as it has developed, including some criticisms from the academic community, cultural concerns about mindset messaging, and persistent misconceptions regarding implementation—especially in regard to individual-focused mindset interventions. In this section, we explore these challenges and discuss how the field has addressed them, as well as how these challenges can motivate future research.

### *5.1.1 Heterogeneity of mindset effects*

Criticisms from the academic community often center on questions regarding heterogeneity of mindset effects at the individual (micro-) level. We have already reviewed studies at this level that document links between individuals' growth mindset beliefs, mastery orientation, persistence in the face of challenges, and achievement; however, some studies have not consistently found these relationships or have questioned their magnitude (e.g., Bahník & Vranka, 2017; Burgoyne, Hambrick, & Macnamara, 2020; Li & Bates, 2019). Given that variation should be expected with any psychological factor, several meta-analyses have assessed whether, when, and how people's personal mindset beliefs influence their motivation and achievement-related outcomes.

The first of these meta-analyses, by Burnette and colleagues (2013), examined how people's mindset beliefs were associated with self-regulation processes across both academic and non-academic domains (e.g., leadership, management, health, athletics). Using self-control theory as a framework (Carver & Scheier, 1982, 2001), their meta-analysis examined how mindset beliefs influence how people set goals, work toward achieving them, and track their progress. Results largely supported mindset theory, showing that growth mindset beliefs were positively and significantly associated with setting learning goals ($r = .187$), using mastery-oriented strategies ($r = .227$), and maintaining positive expectations for success ($r = .157$), and negatively and significantly related to performance goals ($r = -.151$), helpless-oriented strategies ($r = -.238$), and negative emotions ($r = -.233$). Further, consistent with mindset theory (e.g., Dweck & Leggett, 1988; Dweck, 1999), these associations were strongest

when people faced challenging situations, such as when they received failure feedback. The researchers found that growth mindset beliefs were only weakly directly related to achievement ($r = .095$, $p < .01$); instead, the positive effects of growth mindset beliefs on achievement occurred *indirectly*, through greater use of mastery-oriented learning and behavioral strategies, positive expectations, and reduced negative emotions like anxiety. That the findings of this meta-analysis were largely consistent with mindset theory is no surprise, given that mindset theory has always been a theory of motivation—hypothesizing the mindset beliefs shape people's goals and behavior (the mindset meaning system), and that these mindset-driven goals and behavior in turn can affect achievement (e.g., Dweck & Leggett, 1988; Dweck, 1999; Molden & Dweck, 2006).

A few years later, Sisk and colleagues (2018) conducted two meta-analyses on mindset. The first examined the relationship between people's personal growth mindset beliefs and their academic achievement. Consistent with Burnette and colleagues' (2013) meta-analysis, the direct effect was weak but statistically significant ($r = .10$), with stronger growth mindset beliefs associated with higher achievement. However, Sisk and colleagues (2018) did not examine theoretically derived mediating factors (goals, behavior) that help explain *why* and *under what circumstances* mindset beliefs influence achievement outcomes.

Their second meta-analysis examined the extent to which individual-focused growth mindset *interventions* affected academic achievement (Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018). Again, the direct effect was weak yet statistically significant ($d = 0.08$), suggesting that individual-focused growth mindset interventions positively influence achievement. However, when examining the range of effect sizes for different intervention programs, it is clear that substantial heterogeneity in intervention effectiveness exists and that there is a need to understand how these effects vary across groups and contexts. Certain groups, for example, have been theorized to benefit more from individual-focused growth mindset interventions, such as students from lower socioeconomic backgrounds or those at higher academic risk; consistent with this theorizing, research has found these groups experience greater benefits from these intervention programs (e.g., Claro et al., 2016; Hecht, Buontempo et al., 2024; Paunesku et al., 2015).

Even more recently, a pair of dueling meta-analyses on the extent to which individual-focused growth mindset interventions affect achievement were published in the same issue of *Psychological Bulletin*. Although both meta-analyses focused on the same topic, the two teams described the goals

of their meta-analyses differently and used different analytical strategies—and arrived at different conclusions. Burnette and colleagues (2023), employed a multilevel meta-regression approach that was focused on examining theoretically-derived heterogenous factors (including student-level factors and intervention implementation factors) that have been posited to influence the effectiveness of these interventions for achievement and mental health—as well as the meaning system (beliefs, goals, and behaviors) that has been theorized to stem from growth mindset beliefs. Results indicated a small but statistically significant overall effect of individual-focused growth mindset interventions on academic achievement ($d$ = 0.09), and emphasized that, based on theory, the true value in the meta-analysis was in understanding for whom and under what conditions these interventions are most effective. Indeed, their multilevel meta-regression analysis revealed the importance of implementation fidelity and context: larger effects were observed when the interventions were delivered as intended and when they focused on students who stood to benefit the most ($d$ = 0.14). They also found significant impacts on the mindset meaning system (consistent with the Burnette et al., 2013 meta-analysis) such that the individual-focused growth mindset interventions increased students' positive expectations for success ($r$ = .25) and goal-directed behaviors ($r$ = .20)—key mediating factors that support academic gains—while also positively impacting mental health ($d$ = 0.32) and social functioning ($d$ = 0.36) at levels that compare favorably with other mental health effects such as the effect of antidepressant medication (vs. placebo) on mild-to-moderate depression ($d$ = 0.20; Fournier et al., 2010).

At the same time, Macnamara and Burgoyne (2023) conducted a meta-analysis on individual-focused growth mindset interventions with the goal of assessing "whether growth mindset interventions generally improve students' academic achievement" (p. 137). Some scholars have questioned this "all-or-nothing" approach to meta-analysis, noting that more advanced methods for handling the heterogeneity of meta-analytic data have emerged in recent years (see Tipton et al., 2023, pp. 233–235). These newer methods, like those used by Burnette and colleagues (2023), provide an average effect size while also allowing researchers to investigate and explain the variation around that effect to understand *when* and *for whom* growth mindset interventions work best. In contrast, Macnamara and Burgoyne (2023), with their focus on the *overall effect* of growth mindset interventions, used the more traditional analytic approach that aggregated effect sizes at the study level and limited their ability to model within-study heterogeneity.

Using this traditional approach, Macnamara and Burgoyne found smaller effects of individual-focused growth mindset interventions on academic achievement than did Burnette and colleagues ($d = 0.05$); the authors concluded that the interventions' impact on achievement was negligible, and that methodological flaws and publication bias likely inflated the perceived benefits of individual-focused growth mindset interventions. Interestingly, Tipton and colleagues (2023) later re-analyzed Macnamara and Burgoyne's data using the newer heterogeneity-focused meta-analytic methods, finding results that more closely aligned with Burnette and colleagues' (2023) analysis. This re-analysis indicated that individual-focused growth mindset interventions, when implemented with fidelity and tailored to the needs of specific at-risk groups, can produce meaningful benefits (0.15 SD, $p < .001$).

In our view, progress in mindset intervention research will depend on careful, heterogeneity-attuned methods that test theoretically-derived predictions about where, when, and for whom growth mindset beliefs, goals, and behavior are most beneficial (Bryan, Tipton, & Yeager, 2021; McPartlan, Solanki, Xu, & Sato, 2020; Tipton et al., 2023). This will mean returning to the decades of mindset research that has theorized and demonstrated that mindset beliefs shape motivation, goals, and behavioral learning strategies—which in turn predict achievement. Moreover, an increased focus on the surrounding mindset culture (Murphy, 2024)—and distinctions between intended, implemented, and perceived cultures—point to the need to examine how beliefs shape norms, values, policies, and practices and how these affordances influence the extent to which people can act on and benefit from their growth mindset beliefs in fixed or growth mindset cultures.

### 5.1.2 Criticisms of micro-level mindset research as deficit thinking

There has also been some cultural critique against individual-focused growth mindset research. Namely, critics have suggested that growth mindset scholarship adopts a deficit perspective that overlooks structural barriers (Gorski, 2016, 2019; Thomas, 2016, 2017, 2018). These critics argue that mindset research can be interpreted as implying that success or failure is simply a matter of individuals' mindset beliefs and that the focus on individuals' mindsets (especially those of racial-ethnic minoritized students, or lower-income students) diverts attention away from systemic injustices that create and sustain racial and social class disparities—like unequal access to resources and systemic racism. Although mindset researchers have long acknowledged that mindset beliefs are just one part of the larger meaning system that

influences students' experiences and outcomes (Dweck & Leggett, 1988; Dweck, 1999), this criticism raises an important issue. It is true that, in some classrooms, growth mindset has been misused in ways that reflect deficit thinking, labeling and dismissing students (e.g., as "bad fixed-minded students"), instead of being used as a framework to uplift and support them (Masterson & Koch, 2021; Russell, 2019; Young, 2021a, 2021b). Some teachers, for example, have attributed students' struggle to assumed fixed mindset beliefs, effectively throwing their hands up in the air and concluding—inaccurately—that there is little they can do to support these students' learning (Dweck, 2015, 2016a, 2016b). Even more troublingly, this dynamic appears to more often affect students of color and students from lower-income and immigrant backgrounds (Patrick & Joshi, 2019) who are already subject to negative intellectual and ability stereotypes that place undue blame on them rather than on structural barriers (e.g., García & Guerra, 2004; Ladson-Billings, 2007; Steele, 1997; Valencia, 2010; Yosso, 2005).

Fortunately, macro-level research on mindset culture suggests one potential way forward. By documenting how fixed mindset beliefs and practices on the part of instructors and other culture creators beget a context of stereotype threat—negatively shaping the experiences and outcomes of students from groups that are negatively stereotyped in society—other targets of intervention (beyond students themselves) emerge. This macro-level mindset culture work reveals a need to focus on culture creators (by providing them with education, guidance, tools, resources, and motivation to effectively implement inclusive growth mindset cultures) and on the racist and classist stereotype processes and structural inequalities that persist (including disparities in school funding, unequal access to quality education, and systemic racism). At its core, the concept of growth mindset cultures argues that students need more than just belief in their potential; they need tangible supports through policies, practices, and resources that enable them to fully engage, persist, and succeed. In this way, mindset culture research aligns with justice-seeking efforts. By emphasizing the importance of supportive structures, mindset culture work makes a case for equity as a practical necessity for sustainable and inclusive growth.

## 6. Correcting persistent misconceptions and building tools to support inclusive growth mindset cultures

To help leaders build inclusive growth mindset cultures, we might start by developing and studying the efficacy of tools and resources that

teach leaders about growth mindset and why and how it matters in their specific context for achieving specific learning objectives. Evidence-based tools that help leaders set clear growth-minded norms, adopt practices, and establish policies that foster and sustain growth mindset meaning systems across their organizations are needed. One lesson that has already emerged, however, is that misconceptions about growth mindset are persistent and widespread, often leading to misapplications of the concept. For example, some teachers believe they have a strong growth mindset and use growth mindset principles in their teaching—but wrongly believe that growth mindset means simply trying hard and applying effort (regardless of whether that effort is effectively moving students toward their goals); teachers guided by these beliefs may blame struggling students for not trying hard enough while ignoring systemic factors such as lack of support. Such misconceptions and misapplications are so common that they are known as the *false growth mindset* phenomenon (Dweck, 2015, 2016a, 2016b). A key first step, then, is to communicate clearly what a growth mindset really is—and, in so doing, what it is not (Murphy et al., 2021). To contribute to efforts to effectively teach about and implement growth mindset and growth mindset cultures (and for future researchers who want to study the efficacy of these efforts), we outline and address common misconceptions and misapplications, considering their implications for fostering Cultures of Growth.

As one prominent example, when people search for "fixed or growth mindset" on the internet and look at the images that are returned, it is common to see many images such as the one presented in Fig. 3). This image represents many of the common misconceptions about mindset that have emerged as mindset has become more popular in educational and organizational settings. We will use this popular image to describe and correct these misconceptions.

## 6.1 Misconception #1: Mindsets exist only in the minds of individuals

First, this image depicts mindset literally in the heads of people. What we know from investigations of mindset at the meso- and macro-levels (described above) is that mindset is not limited to individuals; beliefs about the fixedness or malleability of talent, intelligence, and ability can also be embedded within interpersonal interactions and within the values, norms, policies, practices, and messages of the broader culture (Murphy & Dweck, 2010; Murphy & Reeves, 2019; Murphy, 2024). These interactions and

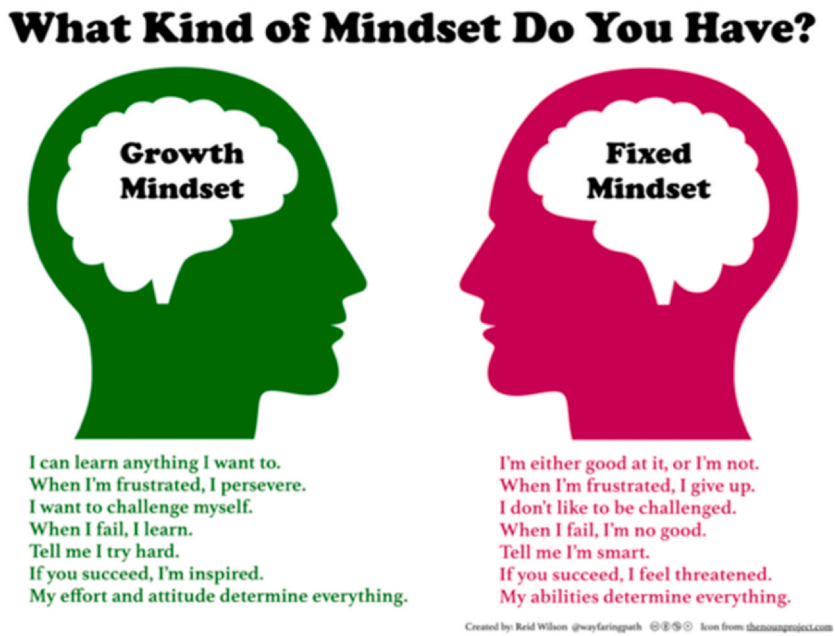


**Fig. 3** The false dichotomy of the fixed and growth mindset (Growth Vs. Fixed Mindset—Lessons—Tes Teach, n.d.).

cultures, in turn, shape how individuals think, act, and behave in a setting. This means that leaders seeking to foster growth mindset meaning systems of belief, goals, and behavior must look beyond their own beliefs and those of their team members to assess what the *context itself* is communicating about mindset—identifying and reshaping values, norms, policies, and practices that may signal fixed mindset beliefs or make it impossible to use or benefit from growth mindset beliefs and behavior, to turn them into environments that support growth and development.

## 6.2 Misconception #2: Mindsets are dichotomous and all or nothing—a person or organization either has a growth mindset or they have a fixed mindset

Notice that the title of this image asks the reader which mindset they have—as though they have to choose *either* the fixed mindset *or* the growth mindset. This is, ironically, a very fixed way of thinking about fixed and growth mindset! Although early discussions and analytic approaches of mindset sometimes depicted it this way (Dweck, 1999, 2016a, 2016b), researchers have acknowledged the problems that this kind of conceptualization produces,

including labeling and shaming oneself and others when they find themselves in their fixed mindset (e.g., Masterson & Koch, 2021; Patrick & Joshi, 2019). Today, scholars are more careful to communicate that people and contexts possess a mix of growth and fixed mindset beliefs (Dweck, 2016a, 2016b). Instead of as a (false) dichotomy, mindset beliefs are more accurately conceptualized as a continuum, with strong growth mindset beliefs at one end and strong fixed mindset beliefs at the other (Murphy & Reeves, 2019; Murphy et al., 2021; Murphy, 2024). Moreover, a person's beliefs are not fixed in place on this continuum; they shift depending on situational cues and triggers in their environment. Reducing mindset to a simple dichotomy makes it more likely that people will moralize the concept (e.g., growth equals good, fixed equals bad), in turn making people hesitant to acknowledge their own fixed mindset beliefs and how those beliefs might affect their goals and behavior or interactions with others. This can cause leaders to overlook how their own words, actions, and policies can influence the mindset beliefs of those they lead, stunting efforts to make the culture more growth-oriented (Murphy & Reeves, 2019). Similarly, an organization's mindset culture is not static—it can shift over time as new people join, leadership changes, and policies evolve. Indeed, growth and fixed mindset beliefs can even be endorsed and communicated *simultaneously*, referred to as "mixed mindsets" (Muenks et al., 2024b). Mindsets and mindset cultures are dynamic, not rigid labels.

## 6.3 Misconception #3: Simply saying "ability is growable" will make it so

By now it should be clear that espousing or communicating a growth mindset is not as simple as repeating a positive mantra. Mindset beliefs represent a starting point: they plant a seed that nurtures a larger meaning system of related beliefs, goals, and behaviors that collectively support people's growth and development (Murphy et al., 2021). For example, when a person believes that ability is something they can develop, it can make effort feel like a worthwhile means to improvement. It may also reduce performance anxiety, shifting the focus from proving oneself to learning and assessing progress. These additional beliefs and goals lead to behavior changes that contribute to growth and learning. Mindset beliefs are a gateway to other attitudes, goals, and behaviors that shape people's experiences and outcomes. Beyond linking mindset beliefs to a meaning system of related beliefs, goals, and behaviors, the context or culture must support that mindset meaning system (e.g., Hecht, Bryan et al., 2023;

Hecht, Dweck et al., 2023; Yeager et al., 2022). As a leader, this distinction is key. Simply telling people they are smart and capable, or offering blanket encouragement like "you can do anything," is not enough. People are capable of remarkable achievements; yet, realizing their potential requires access to feedback, skills, strategies, and resources. Without this access, such affirmations are hollow and ineffective.

## 6.4 Misconception #4: Building a growth mindset culture means just being nice and protecting people from discomfort

Growth mindset beliefs carry an inherent optimism—the idea that our abilities can be developed over time is more motivating than believing they are unchangeable. Although it is true that individuals and organizations signaling a growth mindset are often perceived as kinder and more supportive compared to those signaling a fixed mindset, building a growth mindset culture is not synonymous with constant warmth and comfort (White et al., 2024). This perception misrepresents what it means to create authentic growth mindset cultures. When leaders mistakenly believe that fostering a growth mindset culture means being endlessly nice or warm, they may hesitate to provide the constructive feedback necessary for real improvement. Indeed, when cultivating growth mindset cultures, growth-minded practices can sometimes be demanding, difficult, and uncomfortable (e.g., Kroeper et al., 2022a, 2022b; Yeager, 2024). It means holding people to high standards—aiming for continuous development and mastery. Growth mindset cultures are also more rigorous because they demand an honest assessment and tracking of progress and the willingness to try new strategies or seek help when progress has stalled or when something is not working. They involve openly acknowledging mistakes and lingering on them to dissect the valuable lessons they hold. They require allowing others to experience frustration and struggle through challenges without stepping in too quickly to 'fix it' for them, as grappling with difficulty is often where deep learning occurs. In other words, practicing a growth mindset and creating a growth mindset culture is not just about warmth and cheerfulness. Instead, it is often uncomfortable, frustrating, and may involve giving feedback that people do not want to hear (delivered constructively, such as, "We're not there yet; what are we missing?"; Walton & Brady, 2020). Simply "being nice" and protecting others from discomfort can actually undermine genuine learning and growth.

### 6.5 Misconception #5: Growth mindset culture = effort, effort, effort

Leaders in growth mindset cultures emphasize that developing abilities does require effort—but also requires adopting effective strategies, seeking help, and learning from mistakes and setbacks. Moreover, leaders play a role in creating environments where feedback, support, strategies, and resources are provided to enable people to grow and develop. In these cultures, value isn't placed on effort for effort's sake—it's placed on *effective* effort—that is, effort that moves one closer to one's goal and leads to learning, development, and growth. Effort that performs busyness but doesn't lead to learning or progress is not the end goal in Cultures of Growth.

Growth mindset cultures do not emerge from hollow encouragement to "try harder." Instead, they require values, norms, practices, and policies that reinforce a growth mindset meaning system. For individuals within these cultures, this means recognizing (and reminding oneself) that abilities are malleable and that by putting in effort, using effective strategies, and seeking help they can grow their skills and achieve meaningful goals. For leaders, it means actively shaping the culture to enable these beliefs to become a reality by shaping the affordances in the context. This involves empowering people by providing the right mix of challenges and support, constructive feedback, strategies, and resources. By clarifying what a growth mindset culture is—and just as importantly, what it *is not*—we hope that leaders will be better positioned to build contexts that provide the resources, feedback, and challenge necessary for meaningful, sustainable growth.

## 7. Mindset research as a valuable case of scientific evolution

The current chapter has traced mindset research from its early focus on individual differences (e.g., Dweck & Leggett, 1988; Dweck et al., 1995) to an understanding of how mindsets shift in response to situational cues and social interactions (e.g., Mueller & Dweck, 1998) and more recently, to consider how mindset cultures within classrooms, workplaces, and organizations shape people's beliefs, goals, and behaviors through their values, norms, policies, and practices around learning and ability (e.g., Murphy & Reeves, 2019; Murphy, 2024). One (cynical) way to view these developments and progression of mindset theory and research might be to

say it is "flip-flopping" or moving the goalposts—from seeing mindset as an individual difference, to situationally dependent, to something shaped (and reshaped) by broader cultural core beliefs and practices. But another way to view it—indeed, the way we view it—is as a case of *scientific evolution* unfolding across four decades of scholarship. With new findings, including those that challenge or disconfirm hypotheses, it is normal and adaptive for scientists to refine their theories—and test them in subsequent studies. Disconfirmed hypotheses and failures to replicate are not the end of a research question or investigation; in the most productive science, they are the *beginning* of an investigation. Indeed, they are welcomed and greeted as opportunities to spur deeper thinking, theorizing, and investigations. This has been true of mindset research. Instead of saying "it is context" or "there are boundary conditions" when these challenges emerge and leaving it at that, mindset scholars have dedicated themselves to theorizing and testing specific theory-congruent boundary conditions, identifying person-level, context-level, and implementation-level moderators, and updating the field's understanding accordingly—a growth-minded approach to the study of mindset itself.

For example, one of the earliest findings that pushed mindset theory forward was the discovery that mindset beliefs could be experimentally induced. That is, researchers found that exposure to educational materials and information arguing for the view that intelligence was either fixed or malleable could reliably shift people's mindset beliefs (e.g., Bergen, 1991). These studies contributed to the evolution of mindset theory by revealing that people could access *both* fixed and growth mindset beliefs. This understanding was game-changing for the field, opening up new directions in both research and practice. For instance, it suggested that helping people shift from a fixed to a growth mindset was not only possible but could be actively encouraged through education-focused tools and interventions (e.g., Aronson et al., 2002; Blackwell et al., 2007; Good et al., 2003).

Of course, the shift toward intervention illuminated new challenges. Why, for example, did some studies find that individual-focused growth mindset interventions boosted achievement, whereas others reported small or null effects? Instead of searching for a definitive answer—whether mindset interventions "work" universally or not—researchers returned to the nuances of mindset theory, seeking to understand *when*, *why,* and *how* growth mindset interventions foster achievement. Evidence suggested that successful interventions are those implemented with fidelity and adapted to the specific needs of targeted groups (Burnette et al., 2023; Tipton et al., 2023).

Additionally, growth mindset messages tend to be more effective in settings where the mindset culture and others within the context support these messages rather than undermine them (Hecht, Bryan et al., 2023; Yeager et al., 2019; Yeager et al., 2022), leading to yet further refinements of growth mindset theory.

Another major shift in mindset theory came with the recognition that mindsets are not merely individual beliefs, but can be embedded in the cultural beliefs, values, and practices of settings (Canning et al., 2020; Emerson & Murphy, 2015; Murphy & Dweck, 2010). This insight—that a setting's mindset culture can shape how people think, feel, and behave—has been transformative. This evolution in our understanding of how mindset can work points to a new focus for researchers and organizational leaders alike: identifying and shaping the values, norms, policies, and practices that support people's growth mindset meaning systems of beliefs, goals, and behavior (Kroeper et al., 2022a, 2022b). By identifying and attending to these cues, researchers and leaders have devised clever ways to restructure environments to create Cultures of Growth (e.g., Canning et al., 2022; Canning et al., 2024; Murphy, 2024), driving mindset theory in new, exciting directions.

What has become clear in the field of mindset research is the need to tackle important questions of heterogeneity—understanding for whom, when, and under what conditions mindset beliefs, interactions, and culture impact people's goals, beliefs, and behavior. Investigating these questions will require not only clear theory-driven hypotheses but will also require careful study designs with large and diverse samples—studies with enough statistical power to test individual-level, context-level, and study or implementation-level moderators. Given the impact of mindset at multiple levels of analysis (micro-, meso-, and macro-levels), scholars will need to conduct multi-level and longitudinal studies to understand mindset in context and over time. The challenge, of course, is that these types of study designs are costly and require technical resources that are often available to very few scholars—and primarily those at well-resourced institutions. Thus, the field of mindset scholarship needs greater collaboration and shared research infrastructure (e.g., access to study sites, professional research teams, data analysts, data sharing agreements) to equitably advance the field. Shared research infrastructure will allow more scholars to study these issues using the methods and tools that support the exploration of more sophisticated and nuanced research questions.

## 8. Conclusion

We are optimistic about the future of mindset scholarship. There are so many exciting new directions, especially those that explore the interplay of the individual, situational, and cultural levels of mindsets. The field has expanded and changed—most recently by considering the role of cultural, structural, and systemic factors that shape people's mindset beliefs, goals, experiences, and outcomes. The work of understanding how to motivate and support leaders and members to cultivate growth mindset cultures is a challenging task. Yet the need for engaging, motivating, and enriching mindset cultures in our mainstream institutions such as schools and workplaces has never been more pressing. The COVID-19 pandemic highlighted the deep inequities and disparities that exist for people from structurally disadvantaged backgrounds and for economically developing nations. Growth mindset is a powerful idea that can shape people's beliefs, goals, and behavior, and embedding this meaning system at the core of school and workplace cultures is a tantalizing possibility. Many unanswered questions will need be tackled before we understand how to effectively marshal individual, situational, and cultural mindsets in a way that supports all individuals' experiences and outcomes—and interdisciplinary collaborations with scholars who study culture, including cultural psychologists, sociologists, cultural anthropologists, and organizational behavior scholars, are likely to bring new insights. It will not be easy and there will be many challenges and new developments along the way. Yet, we can envision schools and workplaces where growth mindset cultures inspire people to learn, where equity gaps are closed, where people seek out challenging work and are unafraid to make mistakes, and where people support one another's learning and development. Mindset research—like all good science—will continue to evolve and we are inspired to see what we will learn together.

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