Check for updates

Article

Changing Students' Beliefs About Learning Can Unveil Their Potential

Policy Insights from the Behavioral and Brain Sciences
2021, Vol. 8(1) 84–91
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2372732220984173
journals.sagepub.com/home/bbs
SAGE

Paul A. O'Keefe[1,2], Hae Yeon Lee[1], and Patricia Chen[3]

Abstract

Too often, students fall short of their potential. Although structural and cognitive factors can contribute to this underperformance, how students subjectively construe themselves and their educational contexts can also play significant roles. Social-psychological interventions can increase student motivation, resilience, and achievement by altering these construals. To provide general recommendations for their implementation, we focus on interventions that address common student concerns, which stem from maladaptive beliefs that (a) intelligence cannot be improved; (b) some academic topics are uninteresting and personally irrelevant; (c) learning is an unplanned, passive activity; and (d) others think that "people like me" do not have the potential for success. These interventions tend to be relatively brief, easily implemented, highly scalable, and low in cost, time, and labor. Through a partnership of psychological scientists and practitioners, these carefully contextualized, theory-driven interventions can help students achieve their potential.

Keywords

achievement, interest, mindsets, motivation, social-psychological interventions

Tweet

Carefully developed social-psychological interventions can change how students view themselves and their learning contexts in beneficial ways. As a result, they can cause long-term improvements in student motivation, resilience, and achievement in school and beyond.

Key Points

- Social-psychological interventions can beneficially shift how students think about themselves and their educational contexts.
- These interventions can prepare students to engage with academic challenges, boosting motivation and achievement, and the effects can be long-lasting.
- Implementation of these interventions tend to be relatively brief, highly scalable, and low in cost, time, and labor.
- Designing and implementing such interventions should (a) be a collaborative effort among psychological scientists and practitioners and (b) thoughtfully consider contextual factors, timing of the intervention, psychological reactance, and recursive processes.

Introduction

All students can learn. However, psychological barriers can stand in their way, causing them to underperform, undermining their potential for success in school and beyond. Students may think, for example, "I am not smart enough, and there is nothing I can do about it," "This course is uninteresting and has nothing to do with my life," "I'm not doing well even though I'm working really hard," and "My teachers and peers think that people like me are less intelligent and don't belong here." Such concerns can diminish the motivation to learn among otherwise capable students.

Social-psychological research underscores the critical role of how people make meaning of themselves and their learning situations (Molden & Dweck, 2006). These individual differences in meaning-making can influence how students interpret their achievement contexts, which can either facilitate or thwart their motivation and performance. These social-psychological construals are relevant to policymakers because, unlike many cognitive factors—such as general intelligence (*g*), spatial ability, and processing speed—carefully developed interventions can target these construals. Changing the meaning students make can increase engagement, resilience, and achievement. Moreover, policymakers, governments, and educators may find value in such interventions because they may provide additional—and

[1]Yale-NUS College, Singapore
[2]NUS Business School, Singapore
[3]National University of Singapore, Singapore

Corresponding Author:
Paul A. O'Keefe, Yale-NUS College, 10 College Avenue West, #01-101, 138609 Singapore.
Email: paul.okeefe@yale-nus.edu.sg

sometimes more efficient—tools for improving educational outcomes among the students they represent.

Several social-psychological interventions beneficially change how students make meaning of themselves and their learning contexts. Prominent interventions address maladaptive beliefs, which lie at the root of common challenges that students face. These include beliefs that (a) intelligence cannot be improved, (b) some academic topics are simply uninteresting or seemingly irrelevant, (c) learning is an unplanned, passive activity, and (d) that one will be evaluated through the lens of a negative stereotype. Each of these concerns can prevent students from reaching their potential.

By causing shifts in meaning-making, these interventions set into motion recursive processes that can have compounding benefits over time (Walton & Wilson, 2018). Often, these interventions are easily implemented, scalable, and low in cost, time, and labor. Their development, however, must be precise and requires significant input from both psychological scientists and practitioners. Therefore, we also discuss how these interventions operate to produce beneficial changes and provide recommendations for their implementation.

Promoting the Belief that Intelligence can Improve

Students often encounter academic setbacks while navigating challenging course work. Difficult math problems, for example, can lead students to wonder: "Maybe I don't have what it takes to be successful in this class?" School transitions can amplify these concerns, causing distress (Lee et al., 2019). When academic difficulties arise, students may doubt whether their abilities can actually improve. Interventions that target this maladaptive belief about the nature of intelligence can promote more challenge-seeking behaviors as a gateway to improve academic achievement and persistence over time.

This "growth mindset of intelligence" intervention is theoretically grounded in the implicit theories framework (Dweck & Leggett, 1988), which posits that people have lay beliefs about whether intelligence is relatively unchangeable (a *fixed mindset of intelligence*) or improvable (a *growth mindset of intelligence*). For instance, when students score poorly on a test, a fixed mindset can cause them to avoid challenging problems or withdraw their effort because they attribute their academic setbacks to lack of innate ability (e.g., "failing a math test means I am not smart enough"; Dweck & Leggett, 1988). How can we then teach students that intellectual abilities can grow?

A growth-mindset-of-intelligence training addressed the transition to middle school, (Blackwell et al., 2007), when students typically show notable declines in math performance and question their abilities. Across multiple workshops led by trained teachers (25 min each, over 8 weeks), the growth-mindset intervention taught students about the malleability of the brain. By having students read credible, age-appropriate articles about the science of intelligence, the intervention delivered a key message: Learning changes neural pathways in the brain, and learning can make your brain smarter. As a result, the intervention reversed the trajectory of declining grades in 7th-grade math, while the control group, who learned about brain physiology and memory, continued to show significant declines over the academic year.

Over the past two decades, psychologists have collaborated with educators to refine and scale up the growth-mindset-of-intelligence intervention for more heterogeneous school contexts (e.g., Bettinger et al., 2018; Paunesku et al., 2015; Yeager, Romero et al., 2016, 2019). Large-scale, randomized controlled designs have identified for whom and in what contexts a growth-mindset intervention can most powerfully yield educational benefits. In one study (Yeager et al., 2019), two online sessions of growth-mindset modules had sustained effects on high school achievement, using a stratified random sample of 65 U.S. public high schools including 12,490 9th graders. In the first session, administered at the beginning of the transition to high school, the online intervention with several reading and writing exercises delivered the core message that adolescents' brains are malleable and can develop through rigorous learning. The second session counteracted students' negative effort beliefs (e.g., "Trying too hard or asking for help means I lack ability") and avoidance goals (e.g., "I'd rather avoid advanced classes so I don't look stupid"), which could undermine students' motivation in the face of difficulty.

On average, low-achieving students in the growth-mindset condition (n = 6,320) earned higher GPAs in their core subjects at the end of 9th grade, relative to their counterparts in the control condition (Yeager et al., 2019). Practically speaking, this low-cost online intervention prevented 5.3% of low-achieving students from failing in 9th grade (earning a "D" or "F" in core subjects). Interestingly, these beneficial treatment effects differed across schools: School-average achievement levels and peer norms influenced sustained gains in 9th-grade achievement. That is, low-achieving students in low-achieving schools showed greater improvements in their GPA relative to those in high-achieving schools. Moreover, in schools where peers were more supportive of challenge-seeking, the growth-mindset message yielded improvements in their GPAs, relative to those in schools with unsupportive peer norms for challenge-seeking. These nuanced findings suggest that growth-mindset messages might be more effective in a school context where a majority of students are susceptible to a vicious cycle of poor performance and a fixed mindset, yet peer climates are open to encourage growth-oriented behaviors.

Promoting Interest in Academic Subjects

Many students struggle in school, not only because they believe they lack the potential to learn, but because they do not find their course material interesting. Interest is a

tremendous source of intrinsic motivation that can increase engagement, performance, and self-regulation (e.g., O'Keefe & Linnenbrink-Garcia, 2014; see O'Keefe et al., 2017). Therefore, promoting interest among students is a critical matter to address. Although numerous approaches promote interest (see Harackiewicz, Smith, et al., 2016), only some interventions target (a) students' mindsets about interest and (b) the value they hold for their academic subjects, which both can promote interest and achievement in courses.

Interest Mindsets

One such intervention targets students' lay beliefs about the nature of interest. Just as people can hold fixed and growth mindsets about intelligence, so too can they hold such beliefs about interest (O'Keefe et al., 2018b). Students with a *fixed mindset of interest* tend to view interests as inherent and relatively unchangeable. From this perspective, once a student feels they have "found" their interests, they have no reason to explore new or different academic areas. Therefore, a student with interests solely in the arts, for example, might not deeply engage in their math or science courses. By contrast, those with a *growth mindset of interest* view interests as cultivated and developable. Therefore, even if they already hold strong interests in one area, they might could still explore other areas. Such a student would be more likely to engage in their math and science courses and, as a result, become more interested in the topics and learn more.

These ideas were tested among undergraduates in a school of arts and social sciences, many of whom had little-to-no pre-existing interest in math and science (O'Keefe et al., 2020). Before matriculating, incoming college students completed an online exercise that involved several reading and reflective writing exercises designed to promote a growth mindset in one condition, or optimal study skills (i.e., control) in another condition. In their first year of college, these students were required to take two courses in math and science: a quantitative reasoning course and a computation course. For students whose pre-existing interests did not include math and science, the growth-mindset-of-interest intervention increased both their self-reported interest and final grades in those two courses, relative to the control condition. Therefore, viewing interests as developable, and not fixed, caused students to engage more deeply in topics they may have otherwise avoided or merely endured.

A growth mindset of interest, as compared to a fixed mindset, also increases a tendency and ability to integrate seemingly disparate fields, like the arts and sciences (O'Keefe et al., 2021). Therefore, in the long run, students with a growth mindset of interest may be more likely to pursue interdisciplinary educations and careers, or perhaps minor in fields that are outside of their pre-existing interests (O'Keefe et al., 2018a).

Usefulness and Relevance

Another effective approach to promoting interest among students involves highlighting the personal usefulness or relevance (or *utility value*; Eccles, 2009) of particular subjects—a key component of more deeply held, internalized interests (see O'Keefe et al., 2017; O'Keefe & Harackiewicz, 2017). For example, one reason many students lack interest in science is because they often do not see its relevance to their lives and goals. One utility-value intervention study (Hulleman & Harackiewicz, 2009) targeted first-year high school science students and examined whether a simple exercise could increase their interest in the subject. At the beginning of the semester, students were given booklets in which they periodically wrote essays. In the treatment condition, they were instructed to write about how what they were learning in their course was relevant to their lives. In the control condition, students summarized the material, as teachers often require. At the end of the semester, students in the utility-value group who started with low expectancies for success in their science course expressed greater interest in science than those in the control condition at the end of the semester, and they earned better grades in the course—almost two-thirds of a letter grade higher than the control condition.

An intervention using a similar utility-value writing exercise also reduced achievement gaps among disadvantaged students. In an introductory college biology course, first-generation, underrepresented minority students in the utility-value condition earned higher grades (vs. control; Harackiewicz, Canning, et al., 2016). The boost in interest offered these students an extra source of motivation that their more privileged classmates may have already possessed. Taken together, when students have the opportunity to make their own connections to their course material, it helps them see its usefulness and relevance to their lives, increasing their value of learning.

Promoting Strategic Learning

Doing well in school requires motivation, but it also takes effective strategies. Competent, motivated students who do not use effective strategies to learn may fall short of achieving their potential, and in times of failure, they may question whether they have what it takes to achieve. By contrast, students who are more strategic in their learning (such as by using more effective learning methods or resources, and monitoring their learning) tend to develop greater subject mastery and attain higher grades (Pintrich et al., 1991; Zimmerman & Schunk, 2001).

At the root of the problem lies a common misconception about learning. Some students tend to construe learning as a passive, unplanned activity—for example, simply showing up for class or re-reading the textbook (Chen, 2020). When these students encounter difficulty or poor grades, they may

blame their lack of ability or simply try harder using the same ineffective strategies. In contrast, psychologists construe learning as a proactive, self-regulated process, which includes planning, self-monitoring, and revising methods when unproductive (Pintrich et al., 1991). Helping students overcome such a passive, nonstrategic interpretation of the learning process can empower them to learn and perform better. Two social-psychological interventions—one that guides strategic resource-use and another that instills a strategic mindset—illustrate how this can be done effectively.

Guiding Strategic Resource Use

In a brief (~15-min) online "strategic resource use" intervention, students were guided through the strategic process of self-reflecting on their resource-use for learning (Chen et al., 2017). Two cohorts of introductory statistics college course students were randomly assigned to either a strategic-resource-use intervention condition or a control condition. In addition to a regular exam reminder that all students received a week before their exams, those in the strategic-resource-use condition received a series of prompts and questions to strategize their use of resources, including: (a) *what* kinds of questions they would expect to see on their upcoming exam, (b) *which* resources (including study materials and other people) would help them prepare for the exam effectively, (c) *why* each resource would be useful to their learning, and (d) *when, where*, and *how* they would use the selected resources to study. Students had the autonomy to personalize their own learning through this metacognitive exercise.

Across both field experiments, students in the strategic-resource-use condition outperformed peers in the control condition on each of their class exams, and by an average of one-third of a letter grade in the class overall (Chen et al., 2017). Students in the strategic-resource-use condition reported that they engaged in more self-reflection on their learning, and, in turn, used resources more effectively when studying. Hence, offering students a strategic construal of the learning process, and scaffolding their strategizing, contributes to effective learning.

Instilling a Strategic Mindset

Even when people know that they should use effective strategies and even when they already know how to use various strategies, they may not necessarily call on such strategies when needed (e.g., Diener & Dweck, 1978). Especially when students are frustrated or stuck, some may have difficulty thinking of appropriate strategies or generating new ones in-the-moment. Instilling a mindset oriented toward searching for and using effective strategies helps students construe difficulties more strategically, and enables them to apply better strategies when needed.

A strategic mindset is an orientation to spontaneously and frequently ask oneself strategy-eliciting questions—such as "What can I do to help myself? How else can I do this?"—when faced with challenges or unproductivity (Chen, Powers, et al., 2020). This mindset is associated with adaptive patterns of attributions after setbacks (Chen, Chua, & Ong, 2020), and more effective use of learning strategies, which, in turn, predicts better academic performance (Chen, Powers, et al., 2020). For example, American college students and Singaporean students aged 12 to 16 years who had a strategic mindset were less likely to attribute poor exam performance to a lack of ability in the subject, and more likely to attribute it to ineffective study methods (Chen, Chua, & Ong, 2020). In a lab experiment, instilling a strategic mindset increased people's reported use of effective strategies on a challenging and unfamiliar behavioral task, relative to a comparable control. In turn, those who used more effective strategies during the task did so more efficiently (Chen, Powers, et al., 2020). Therefore, inducing people to hold a strategic mindset, even briefly, can have beneficial downstream effects on actual performance.

Reducing Group-Based Achievement Gaps

Student underperformance can also stem from one's group membership. Undeniably, structural inequalities in society often cause differences in achievement between certain groups and their more privileged counterparts (e.g., some groups have better access to educational opportunities than others). However, group differences can also emerge when negative stereotypes about one's group are salient, such as when underrepresented minorities matriculate at predominantly European American colleges, or when women are in male-dominated STEM courses. In such situations, these students may experience *stereotype threat*, causing them to worry about confirming a negative stereotype associated with their group (e.g., "My teachers and classmates don't think people like me are smart enough"; Steele, 1997). This worry leads to underperformance even when those students are equally prepared for the same task, such as an exam or standardized test. Two intervention approaches can buffer particular groups against stereotype threat and reduce group-based achievement gaps. These address students' sense of belonging and their self-integrity when faced with threats and performance-related stress.

Social Belonging

Social belonging is an essential human need (Baumeister & Leary, 1995). Although this sense of having positive relationships with others is crucial, many students may not feel that they belong in particular educational settings because of negative stereotypes associated with their group, and this belonging uncertainty can have hidden psychological consequences. Not

uncommonly, when beginning college, students struggle initially—they are adjusting to life away from home, new social surroundings, and demanding courses. However, European American students tend to bounce back from these challenges, whereas African American students often continue to struggle academically (e.g., Walton & Cohen, 2011). One difference between these two groups is that European Americans tend to attribute their initial struggles to their adjustment to a new social environment. They are less likely to question whether they will eventually feel they belong at the college. By contrast, African American students may attribute their initial struggles to feeling that they may not belong; this belonging uncertainty can undermine their achievement.

An intervention can help prevent this latter, more harmful type of construal (belonging uncertainty; Walton & Cohen, 2011). During students' second semester at a prestigious private university, where most students were European American, European American and African American students participated in a 1-hour lab session. In the randomly assigned social-belonging condition, students completed a number of reading and reflective exercises communicating that social adversity in school is a common experience, but not lasting. Therefore, one should not attribute adversity to one's own deficiencies or to their ethnic group. Control-condition students completed similar exercises, but on a topic unrelated to belonging in college.

As expected, the treatment had no effect on European American students' academic achievement, but for African Americans, who were more susceptible to stereotype threat in the university context, the social-belonging treatment (vs. control) significantly increased their GPA over time. By the end of college, the achievement gap between African Americans in the social-belonging condition and European Americans was reduced by half. Beyond achievement, African Americans in the social-belonging condition (vs. control) also reported better psychological and physical health (Walton & Cohen, 2011). Therefore, by offering African American students a way to reattribute the reasons for their initial struggles in college, the belonging intervention removed a psychological barrier that may have otherwise thwarted their academic success. Furthermore, the benefits of the intervention lasted long after students graduated; 7–11 years later, African Americans in the social-belonging (vs. control) condition reported greater career success, satisfaction, and psychological well-being (Brady et al., 2020).

Values Affirmation

Another method of combating stereotype threat is to provide an alternative source of self-integrity when it is threatened. People are motived to see themselves as good, virtuous, and competent (Steele, 1988), so students experiencing stereotype threat—and its negative consequences for achievement—can feel their self-integrity diminish. One way for students to buffer against this threat is to affirm other positive aspects about the self that they value. Doing so can reinstate self-integrity and enable students to face their academic challenges head-on.

An intervention leveraging self-affirmation was shown to combat the stereotype threat experienced by 7th-grade African American students, which had caused them to underperform in their courses compared to their European American classmates (Cohen et al., 2006). Toward the beginning of the fall semester, participating students were provided a list of potentially important values, such as their close relationships and being good at art, and completed a brief writing assignment. In the values-affirmation condition, students were led to select the value most important to them and wrote a brief essay explaining why. In the control condition, they selected the least important value and wrote about why it might be important to someone else. To reinforce their chosen values, students also rated their agreement with statements like "I care about these values" (values-affirmation condition) or "Some people care about these values" (control condition).

By the end of the semester, African American students in the values-affirmation condition earned higher grades in the targeted course, on average, than those in the control condition. The treatment reduced the achievement gap between African Americans and European American students by 40%. Furthermore, a follow-up study showed that the academic benefits of the intervention lasted up to 2 years (Cohen et al., 2009).

Together, social-belong and values-affirmation interventions can reduce achievement gaps, but the effects are not limited to African Americans. Similar interventions have shown comparable effects for other groups, such as women in STEM (Walton et al., 2015), whose abilities are often stereotyped as inferior to men's (e.g., Plante et al., 2019), and first-generation college students (Harackiewicz, Canning, et al., 2016), who may be stereotyped as less capable among their peers.

Recommendations for Implementing Interventions

Core Principles of Implementing Social-psychological Interventions

Social-psychological interventions are promising tools to alter students' meaning-making processes about themselves and their learning experiences; this can ultimately improve how they respond to their academic challenges. As illustrated, these interventions can enhance motivation, learning, and performance. Granted, addressing common, persistent academic problems for diverse groups of students and sustaining their positive effects for months, or years, requires a complex understanding of the interplay among psychological (e.g., belief, attitude, motivation), educational (e.g., curriculum, assessment), and structural (e.g., school systems,

cultures) factors that are beyond the scope of this article (see Walton & Wilson, 2018; Walton & Yeager, 2020).

On their surface, these interventions may seem too simple to achieve sustained academic benefits. How can these seemingly magical effects be possible, even without directly teaching effective study skills, or explicitly encouraging hard work? What common principles among these social-psychological interventions can inspire theoretically precise and practically impactful implementation in educational contexts? Three core principles underlie effective intervention design and implementation that enables positive changes in students' motivation and academic achievement.

Timing is critical. Intervention messages that attempt to revise students' maladaptive beliefs can be more impactful when academic threats are psychologically salient, and while opportunities for improvement exist (Cohen & Garcia, 2014). Initial school transition periods, for example, are crucial moments when students often question whether they have the potential to succeed, whether the content of their courses is interesting or relevant, or whether they feel that they fit in. Social-psychological interventions often target this window of vulnerability (and opportunity) to channel students' initial worries into more productive construals, enabling them to take on challenges, develop adaptive learning strategies, and, therefore, achieve. For example, growth-mindset-of-intelligence interventions targeted incoming high school students during the first few months of their transition (e.g., Bettinger et al., 2018; Yeager et al., 2019), and during the transition to middle school (e.g., Blackwell et al., 2007). Similarly, social-belonging interventions implemented in pre-matriculation college orientation programs, or early in college, emphasized the transitory nature of their initial worries. Such critically-timed interventions can produce significant upward trajectories of school achievement (e.g., Walton & Cohen, 2011; Yeager, Walton, et al., 2016, 2019) and even lasting improvements in later life outcomes (e.g., Brady et al., 2020).

Avoid psychological reactance. Commonly, students face adult authority figures (e.g., parents, teachers) demanding changes in their behavior or attitude. Telling students what they should do or believe can backfire because such demands threaten students' sense of autonomy. These autonomy-threatening messages treat students as helpless individuals who constantly need guidance from adults (Yeager et al., 2018). Such demands can potentially elicit psychological *reactance*—the motivation to restore personal agency when lost or threatened (Brehm & Brehm, 2013). To minimize such resistance, many social-psychological interventions respectfully invite students to play a contributing role in solving problems (e.g., "We need your help"), rather than telling them how to solve their own problems. For example, growth-mindset interventions often engage students to write a letter to future incoming students, to explain what they have learned from the intervention activities and how incoming students might (not "should") deal with difficult academic challenges through a new lens (e.g., O'Keefe et al., 2020; Yeager et al., 2019). Similarly, social-belonging interventions do not single out disadvantaged students as negatively stereotyped groups who need special attention. Instead, they support these students to realize how common their worries are among all students, and the transitory nature of such concerns (e.g., Walton & Cohen, 2011; Brady et al., 2020).

Mobilize a self-reinforcing recursive process. Change does not occur in a day. While intervention messages may be brief when implemented (often less than 60 min), these messages can create a powerful self-reinforcing recursive process that sets in motion more adaptive interpretations of academic struggles. These adaptive interpretations help students make more productive choices at critical junctures of their academic life. Social-psychological interventions seed new, adaptive meaning-making, and help students internalize these interpretations. Subsequently, when faced with challenges or setbacks during which they might otherwise apply their default maladaptive interpretations, students can apply a new lens and interpret such adversity in a more adaptive light. This, in turn, motivates more adaptive responses from students (seeking challenges, investing effort, exploring potential interests, and using effective learning strategies); all can promote subject mastery and academic achievement. For example, strategic-learning interventions (e.g., Chen et al., 2017) encourage learners to generate effective study strategies and to regularly execute them in day-to-day studying situations, especially when they encounter difficulty or unproductivity. Over time, students are more self-reflective, study more productively, and hence, do better on their exams.

Recommendations and Cautionary Tales

The potential benefits of social-psychological interventions may tempt rushing their deployment on a large scale or in new learning environments. While scaling and translating intervention prototypes for field implementation are important from an educational policy perspective (e.g., Cohen & Garcia, 2014), growing evidence suggests that many of the positive effects caused by these interventions are highly context-dependent (Sisk et al., 2018; Walton & Yeager, 2020). Hence, they should be implemented with caution.

First, adopting a kitchen-sink approach by delivering a cocktail of interventions at once might seem effective. However, to date, research on combining interventions has found little evidence of additive effects (e.g., Good et al., 2003; Paunesku et al., 2015). Still-nascent research suggests prioritizing fewer interventions that address precise psychological barriers in a given educational context, not sheer quantity of interventions.

Second, developing psychologically precise interventions and implementing them with fidelity requires collaborations among psychological scientists, educators, and students. Teachers and students with firsthand experience can provide valuable perspectives on translating theory-driven intervention ideas into ecologically-valid interventions that are well-aligned with the contextual constraints and affordances (Walton & Yeager, 2020). Meanwhile, social psychologists can ensure the precision of the intervention content, highlighting key intervention components in delivery. Collaborations among these parties increase the likelihood of achieving an impactful, contextually-relevant intervention, delivered with fidelity.

Third, widely used phrases (e.g., "self-esteem matters," "social-emotional learning," "growth mind-set")—often misapplied by well-intentioned practitioners—can have unintended negative side effects. As an example, the self-esteem movement in America encouraged parents and teachers to shower their students with inflated praise, even for mere participation or mediocre achievement. Such well-intended praise ironically lowered students' self-esteem—they avoided challenging academic tasks for fear of possible negative evaluations about their ability (Brummelman et al., 2014). Therefore, greater public understanding of these psychological constructs can help practitioners to more accurately translate successful psychological interventions into practice.

Conclusion

Students' grades and standardized test scores tempt one to simply conclude that some students have it and others do not. Social-psychological interventions challenge this pre-mature conclusion, demonstrating that students often have more potential than their performance might suggest, and that psychological barriers might hamper them. Precisely designed social-psychological interventions can shift students' meaning-making and empower them to better navigate what are often less-than-optimal learning conditions. However, the onus should not necessarily be on the student to change. Educational systems and institutions must create learning environments that enrich *all* students and level the playing field, particularly in light of societal inequalities. Ideally, interventions would be unnecessary. For now, along with societal and institutional reforms, social-psychological interventions may help struggling students from all backgrounds gain ground and realize their potential, rather than being lost in the educational system.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Paul A. O'Keefe https://orcid.org/0000-0003-3751-7655

References

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529.

Bettinger, E., Ludvigsen, S., Rege, M., Solli, I. F., & Yeager, D. (2018). Increasing perseverance in math: Evidence from a field experiment in Norway. *Journal of Economic Behavior & Organization*, *146*, 1–15.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, *78*(1), 246–263.

Brady, S. T., Cohen, G. L., Jarvis, S. N., & Walton, G. M. (2020). A brief social-belonging intervention in college improves adult outcomes for black Americans. *Science Advances*, *6*(18), eaay3689.

Brehm, S. S., & Brehm, J. W. (2013). *Psychological reactance: A theory of freedom and control*. Academic Press.

Brummelman, E., Thomaes, S., Orobio de Castro, B., Overbeek, G., & Bushman, B. J. (2014). "That's not just beautiful—that's incredibly beautiful!" The adverse impact of inflated praise on children with low self-esteem. *Psychological Science*, *25*(3), 728–735.

Chen, P. (2020). The strategic resource use intervention. In G. M. Walton & A. Crum (Eds.), *Handbook on wise interventions: How social-psychological insights can help solve problems* (pp. 166–188). Guilford Press.

Chen, P., Chavez, O., Ong, D. C., & Gunderson, B. (2017). Strategic resource use for learning: A self-administered intervention that guides self-reflection on effective resource use enhances academic performance. *Psychological Science*, *28*(6), 774–785.

Chen, P., Chua, X. H., & Ong, X. L. (2020). *Changing the Means Instead of Blaming the Person: A mindset to interpret setbacks as poor strategy and not low aptitude*. Manuscript in Preparation.

Chen, P., Powers, J. T., Katragadda, K. R., Cohen, G. L., & Dweck, C. S. (2020). A strategic mindset: An orientation toward strategic behavior during goal pursuit. *Proceedings of the National Academy of Sciences*, *117*(25), 14066–14072.

Cohen, G. L., & Garcia, J. (2014). Educational theory, practice, and policy and the wisdom of social psychology. *Policy Insights from the Behavioral and Brain Sciences*, *1*(1), 13–20.

Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science*, *313*(5791), 1307–1310.

Cohen, G. L., Garcia, J., Purdie-Vaughns, V., Apfel, N., & Brzustoski, P. (2009). Recursive processes in self-affirmation: Intervening to close the minority achievement gap. *Science*, *324*(5925), 400–403.

Diener, C. I., & Dweck, C. S. (1978). An analysis of learned helplessness: Continuous changes in performance, strategy, and achievement cognitions following failure. *Journal of Personality and Social Psychology*, *36*(5), 451–462.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, *95*, 256–273.

Eccles, J. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist*, *44*(2), 78–89.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, *24*(6), 645–662.

Harackiewicz, J. M., Canning, E. A., Tibbetts, Y., Priniski, S. J., & Hyde, J. S. (2016). Closing achievement gaps with a utility-value intervention: Disentangling race and social class. *Journal of Personality and Social Psychology*, *111*(5), 745–765.

Harackiewicz, J. M., Rozek, C. S., Hulleman, C. S., & Hyde, J. S. (2012). Helping parents to motivate adolescents in mathematics and science: An experimental test of a utility-value intervention. *Psychological Science*, *23*(8), 899–906.

Harackiewicz, J. M., Smith, J. L., & Priniski, S. J. (2016). Interest matters: The importance of promoting interest in education. *Policy Insights from the Behavioral and Brain Sciences*, *3*(2), 220–227.

Hulleman, C. S., & Harackiewicz, J. M. (2009). Promoting interest and performance in high school science classes. *Science*, *326*(5958), 1410–1412.

Lee, H. Y., Jamieson, J. P., Miu, A. S., Josephs, R. A., & Yeager, D. S. (2019). An entity theory of intelligence predicts higher cortisol levels when high school grades are declining. *Child Development*, *90*(6), e849–e867.

Molden, D. C., & Dweck, C. S. (2006). Finding "meaning" in psychology: A lay theories approach to self-regulation, social perception, and social development. *American Psychologist*, *61*(3), 192.

O'Keefe, P. A., Dweck, C. S., & Walton, G. M. (2018a). Having a growth mindset makes it easier to develop new interests. *Harvard Business Review*. https://hbr.org/2018/09/having-a-growth-mindset-makes-it-easier-to-develop-new-interests

O'Keefe, P. A., Dweck, C. S., & Walton, G. M. (2018b). Implicit theories of interest: Finding your passion or developing it? *Psychological Science*, *29*(10), 1653–1664. https://doi.org/10.1177/0956797618780643

O'Keefe, P. A., & Harackiewicz, J. M. (Eds.). (2017). *The science of interest*. Cham. https://doi.org/10.1007/978-3-319-55509-6

O'Keefe, P. A., Horberg, E. J., Dweck, C. S., & Walton, G. M. (2020). *A brief intervention portraying interests as developed, not fixed, increases in STEM interest 8 months later*. Manuscript in Preparation.

O'Keefe, P. A., Horberg, E. J., & Plante, I. (2017). The multifaceted role of interest in motivation and engagement. In P. A. O'Keefe & J. M. Harackiewicz (Eds.), *The science of interest* (pp. 49–67). Cham.

O'Keefe, P. A., Horberg, E. J., Saherwal, A., Ibasco, G. S., & Zainal, A. (2021). Thinking beyond boundaries: A growth theory of interest enhances integrative thinking that bridges the arts and sciences. *Organizational Behavior and Human Decision Processes*, *162*, 95–108.

O'Keefe, P. A., & Linnenbrink-Garcia, L. (2014). The role of interest in optimizing performance and self-regulation. *Journal of Experimental Social Psychology*, *53*, 70–78. https://doi.org/10.1016/j.jesp.2014.02.004

Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science*, *26*(6), 784–793.

Pintrich, P. R., Smith, D. A. F., Garcia, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. http://eric.ed.gov/?id=ED338122

Plante, I., O'Keefe, P. A., Aronson, J., Fréchette-Simard, C., & Goulet, M. (2019). The interest gap: How gender stereotype endorsement about abilities predicts differences in academic interests. *Social Psychology of Education*, *22*(1), 227–245.

Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta- analyses. *Psychological Science*, *29*(4), 549–571.

Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology, Vol. 21. Social psychological studies of the self: Perspectives and programs* (pp. 261–302). Academic Press.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, *52*(6), 613–629.

Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science*, *331*(6023), 1447–1451.

Walton, G. M., Logel, C., Peach, J. M., Spencer, S. J., & Zanna, M. P. (2015). Two brief interventions to mitigate a "chilly climate" transform women's experience, relationships, and achievement in engineering. *Journal of Educational Psychology*, *107*(2), 468–485.

Walton, G. M., & Wilson, T. D. (2018). Wise interventions: Psychological remedies for social and personal problems. *Psychological Review*, *125*(5), 617–655.

Walton, G. M., & Yeager, D. S. (2020). Seed and soil: Psychological affordances in contexts help to explain where wise interventions succeed or fail. Current Directions in Psychological Science, *29*(3), 219–226.

Yeager, D. S., Dahl, R. E., & Dweck, C. S. (2018). Why interventions to influence adolescent behavior often fail but could succeed. *Perspectives on Psychological Science*, *13*(1), 101–122.

Yeager, D. S., Hanselman, P., Walton, G. M., Murray, J. S., Crosnoe, R., Muller, C., . . . Paunesku, D. (2019). A national experiment reveals where a growth mindset improves achievement. *Nature*, *573*(7774), 364–369.

Yeager, D. S., Romero, C., Paunesku, D., Hulleman, C. S., Schneider, B., Hinojosa, C., . . . Trott, J. (2016). Using design thinking to improve psychological interventions: The case of the growth mindset during the transition to high school. *Journal of Educational Psychology*, *108*(3), 374–391.

Yeager, D. S., Walton, G. M., Brady, S. T., Akcinar, E. N., Paunesku, D., Keane, L., . . . Gomez, E. M. (2016). Teaching a lay theory before college narrows achievement gaps at scale. *Proceedings of the National Academy of Sciences*, *113*(24), E3341–E3348.

Zimmerman, B. J., & Schunk, D. H. (2001). *Self-regulated learning and academic achievement: Theoretical perspectives*. Routledge.