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MOTIVATION

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As education becomes increasingly commoditized, massive amounts of time and money are being invested in the development of novel student resources (Kunthara, 2020). However, providing students with high-quality materials, cutting-edge technologies, or individualized lesson plans will not contribute to their learning unless they interact with these resources in an effortful and engaged manner. Thus, a question that remains of the utmost importance to parents and educators is: How can we motivate students to learn the information and skills that our community deems important for their development? An aim of educational psychologists who study motivation is to help answer this question by constructing a deeper understanding of what motivates different students to achieve in particular contexts and by developing interventions that leverage this understanding to bolster students' motivation.

Scope of Chapter

There is a long history within educational psychology (dating back to at least the early 1900s) of examining how caregivers (i.e., parents and teachers) can motivate students of different ages to engage in formal learning. Because this continues to be the primary focus of motivation researchers within the field of educational psychology, it is what we will spend the most time discussing in the present chapter (e.g., Symonds & Chase, 1929; see Weiner, 1990).

That being said, it is important to acknowledge that research on motivation within educational psychology has expanded over the past century. Rather than simply examining what parents and teachers can do to support students' motivation and learning, educational psychologists have become interested in the motivational variables that help account for why some caregivers are more likely to engage in these behaviors than others (see Fives & Buehl, 2016; Rowe et al., 2016). One long-term aim of this research is the design of parent interventions and teacher training programs that can help motivate caregivers to engage in supportive practices (e.g., Rowe & Leech, 2019). Another way in which the field has expanded is by examining the impact of motivational factors on students' well-being, rather than designating academic performance and behavior as the only outcomes of interest (e.g., Howard et al., 2021). This change aligns with calls for educational institutions to shift from focusing solely on knowledge and skill acquisition to fostering whole-person development (Wortham et al., 2021). Finally, though much research continues to focus on students' motivation at particular points in

development (e.g., the motivation of elementary *or* college students), investigators who straddle the fields of educational and developmental psychology have explored how motivation changes over time and identified developmental factors that help account for these changes (see Hong & Perez, this volume; Wigfield et al., 2015). Although these lines of research are important, reviewing the theories and findings pertaining to them is beyond the scope of this chapter. For readers interested in these topics, we recommend starting with the cited reviews.

Chapter Overview

The present chapter consists of two main sections. In the first section, we provide an overview of the six theories of student motivation that have arguably had the greatest impact on recent research and practice. In the second section, we discuss some recent theoretical and methodological advances that have pushed the motivation literature in important new directions. These advances have built upon the foundational theories discussed in the first section, but also challenged some of their underlying assumptions.

Foundational Theories of Motivation in Educational Psychology

Although there are numerous influential theories of motivation in the educational psychology literature, reviewing them all is beyond the scope of this chapter (we refer readers to the volumes compiled by Elliot et al., 2017; Renninger & Hidi, 2019; Wentzel & Miele, 2016; Wigfield & Koenka, 2020). Here, we focus on six theories of motivation that have been especially influential in shaping the current trajectory of educational psychology research and have had a large impact on current educational practice. For each, we highlight central theoretical claims, point to interventions informed by these claims, and discuss how the theory has impacted research on student motivation over the past decade.

Social Cognitive Theory

Theory

Social cognitive theory (Bandura, 1997) is predicated on the idea that personal factors (such as perceptions of one's own abilities or the emotions one experiences while engaged in a task), behavioral factors (such as choice, effort, and persistence), and environmental factors (such as feedback from others) interact with and influence each other in a reciprocal manner (i.e., *triadic reciprocality*; Schunk & DiBenedetto, 2020). For example, students' confidence in their abilities can influence their task persistence, but the outcomes of this persistence (such as receiving a good grade on an assignment) can also shape their confidence.

The personal factor that has received the most attention by social cognitive theories is *self-efficacy*, or individuals' beliefs about their capabilities to organize and carry out designated courses of action (Bandura, 1997). Numerous studies have shown that self-efficacy beliefs are a key determinant of students' motivation (as assessed in terms of task choice, effort, and persistence), as well as their learning, self-regulation, and achievement (see Schunk & DiBenedetto, 2020). In turn, self-efficacy beliefs are thought to be shaped by four sources of information: performance accomplishments (e.g., successfully completing a challenging task or earning a high grade on an exam), vicarious experiences (e.g., observing a peer succeed on the same task), social persuasion (e.g., being told that you are good at the task), and physiological and affective signals (e.g., experiencing low levels of anxiety while completing the task; see also Butz & Usher, 2015).

Interventions

Many interventions have been developed to enhance self-efficacy by leveraging one or more of the four types of information just described (see Lazowski & Hulleman, 2016; Rosenzweig & Wigfield, 2016; Unrau et al., 2018, for reviews). For example, a recent intervention (Falco & Summers, 2019) that was effective at improving both the career decision self-efficacy and STEM self-efficacy of adolescent girls included a session in which the participants constructed timelines of their past performance accomplishments, as well as another session in which the facilitator verbally affirmed participants' abilities (i.e., social persuasion). Emerging research suggests that intervening on multiple sources of self-efficacy may be more powerful than intervening on one source alone (Huang et al., 2020; Unrau et al., 2018).

Impact

Social cognitive theory has had a large impact on the motivation literature within educational psychology. It could be argued that the concepts of triadic reciprocality and self-efficacy have helped shape many, if not all, of the other theories discussed here. Indeed, some of these theories have been categorized as "social cognitive theories of motivation," in so far as they focus on examining individuals' unique, context-dependent experiences (e.g., the expectancies or attributions that an individual forms in a specific situation), rather than universal drives and needs that all humans are assumed to possess (see Ryan et al., 2019).

Situated Expectancy-Value Theory

Theory

The version of expectancy-value theory that is currently most influential within educational psychology was developed by Eccles-Parsons et al. (1983), based on a model by Atkinson (1957). The theory, which was recently renamed situated expectancy-value theory (SEVT; Eccles & Wigfield, 2020), posits that the two most proximal factors influencing students' motivation are their expectancies for success and subjective task values. Expectancies, which refer to students' beliefs about how likely they are to succeed at a future task, are conceptually similar to other competence-related beliefs that have been examined in the motivation literature, including self-concept, self-efficacy beliefs, and ability beliefs. Empirically, these beliefs are sometimes indistinguishable from one another, particularly when they are measured in a generalized manner at the domain level (see Bong & Skaalvik, 2003; Marsh et al., 2019). Subjective task value, on the other hand, represents the extent to which students perceive a task as desirable. Students' overall perception of a task's value is positively related to several beliefs, including whether it is enjoyable (intrinsic value), whether it will be useful for meeting current or future goals (utility value), and whether it is personally meaningful (attainment value). In contrast, students' perceptions of the task's negative consequences (perceived costs) are inversely related to their perceptions of its value.

SEVT posits that several motivational aspects of students' behavior, including their academic effort, engagement, performance, and choices (e.g., of activities, courses, majors, and career paths), can be directly predicted by their expectancy and value beliefs. In turn, these beliefs are influenced by a number of distal psychological, social, and cultural factors—including students' performance attributions, broad self-related beliefs, goals, gender, and temperament—such that the distal factors indirectly influence students' behavior via their expectancies and values. Numerous studies have provided empirical support for these direct and indirect pathways across short- and long-term time frames (see Wigfield & Eccles, 2020).

Interventions

SEVT research has spawned an especially fruitful body of intervention research (Rosenzweig et al., 2022). In particular, numerous researchers have designed interventions for enhancing students' task values. The majority of this work asks students to write about the relevance of what they are learning for their lives outside of class, with the goal of enhancing the task's perceived utility value (see Harackiewicz & Priniski, 2018, for a review). More than 30 of these utility-value intervention studies have been published, spanning elementary school through college, various subject areas, and multiple countries (e.g., Harackiewicz et al., 2016; Shin et al., 2019). In general, the studies have shown that utility-value interventions positively influence students' self-reported value for learning, course grades, and subsequent course-taking behavior, typically with larger effects for students who begin the term with low levels of interest or achievement. Beyond this work, researchers have also conducted studies that target both competence-related beliefs and task values as part of the same intervention (e.g., Cromley et al., 2020; Linnenbrink-Garcia et al., 2018); such interventions have been shown to promote students' performance and interest in specific academic subjects.

Impact

SEVT is one of the most commonly used motivational frameworks in contemporary educational psychology. This popularity may be due, in part, to two factors: first, SEVT posits a set of proximal and distal predictors of student motivation that are relatively easy to operationalize, and second, it maps out the specific relations between these variables in a manner that provides researchers with a decent amount of explanatory power when it comes to understanding students' task-related behavior. This specificity has also allowed researchers and educators to develop more precise methods of influencing motivation within particular contexts. Furthermore, by describing some of the ways in which expectancies and values interact with each other and with more distal variables in the model over time, SEVT has served as a useful framework for understanding students' motivational development (Wigfield et al., 2021).

Self-Determination Theory

Theory

At the broadest level, self-determination theory (SDT; Ryan & Deci, 2020) distinguishes between two types of motivation: intrinsic and extrinsic. When students are intrinsically motivated, they engage in academic tasks because they find them to be interesting and enjoyable and, thus, experience them as ends in themselves (Ryan & Deci, 2020; for other theories pertaining to intrinsic motivation, see Csikszentmihalyi et al., 2005, and Hidi & Renninger, 2006). When they are extrinsically motivated, students engage in such tasks in order to obtain some valued outcome (e.g., an external reward, social approval, a sense of pride, etc.) or to avoid an undesirable outcome (e.g., punishment, rejection, guilt, etc.; Ryan & Deci, 2020).

Extrinsic motivation can be further divided into four subtypes based on the nature of the contingent outcomes: external regulation (engaging in a task because of external contingencies, such as monetary incentives for good performance), introjected regulation (engaging because of self-administered contingencies, such as the pride associated with outperforming one's peers), identified regulation (engaging because it seems relevant to one's personal goals), and integrated regulation (engaging because it is central to one's identity). When students participate for external or introjected reasons, they tend to feel as if they are being made to

engage in the task (i.e., they feel controlled); but, when they do so for identified or integrated reasons, or because they are intrinsically motivated, they are more likely to feel that they have freely chosen the activity (i.e., feel autonomous). Thus, a secondary distinction can be made between autonomous forms of motivation, which are generally thought to be beneficial for students' performance and well-being, and controlled forms of motivation, which are considered to be less adaptive.

Indeed, a large meta-analysis (Howard et al., 2021) showed that autonomous forms of motivation (particularly identified regulation and intrinsic motivation) were positively related to academic performance, intention to continue, and satisfaction, and negatively related to anxiety, negative affect, and the intention to drop out. Although this was not the case for controlled forms of regulation, introjected regulation did exhibit positive relations with certain adaptive outcomes, such as effort, engagement, positive affect, enjoyment, self-efficacy, and self-esteem, though these relations were not as strong as they were for identified regulation and intrinsic motivation.

Another important tenet of SDT is that people are more likely to experience autonomous (versus controlled) motivation when the social context supports the satisfaction of their basic needs for autonomy, competence, and relatedness. Autonomy refers to "the need to self-regulate one's experiences and actions," competence is about feeling able "to operate effectively within [one's] important life contexts," and relatedness (also referred to as belonging) "concerns feeling socially connected" (both to close others and social groups; Ryan & Deci, 2017, p. 10-11). General support for this tenet comes from a meta-analysis that examined the relations between parents' and teachers' support for students' autonomy, students' satisfaction of all three needs, and their experience of autonomous and controlled forms of motivation (Bureau et al., 2022).

Interventions

SDT researchers have designed interventions that make use of various strategies for supporting students' psychological needs, especially the need for autonomy. These strategies include providing students with (a) more choice during learning, (b) a meaningful rationale for pursuing particular learning goals, or (c) feedback that conveys empathy with students' perspectives. Such approaches have been largely successful, though their effectiveness can depend on the specific materials provided (for reviews, see Fong et al., 2019b; Patall, 2019). Researchers often administer autonomy-focused interventions directly to students (e.g., Patall et al., 2010), but sometimes they implement their interventions by training teachers to be more autonomy supportive and less controlling toward students (see Reeve & Cheon, 2021, for a review). Interventions have also demonstrated the motivational benefits of bolstering students' feelings of competence (using the techniques described in the sections on social cognitive theory and SEVT) and relatedness/belonging (see Walton & Brady, 2021, for a review).

Impact

SDT has challenged the idea that more motivation is always better. Rather than focusing on the overall quantity of motivation that a student possesses, SDT has demonstrated the importance of considering qualitatively distinct types of motivation (e.g., autonomous versus controlled), both in terms of their differential impact on student learning and well-being *and* the different ways in which they are elicited by the environment. This stands in contrast to SEVT, which specifies different reasons why individuals can be motivated (i.e., types of value), but generally assumes that these reasons contribute to the overall strength of a student's motivation.

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Achievement Goal Theory

Theory

An achievement goal can be thought of as a student's purpose for engaging in achievement-related behaviors (Elliot & Hulleman, 2017). The general aims of achievement goal theory have been to examine (a) the impact that different types of goals have on student engagement and performance and (b) the ways in which these goals are elicited by particular aspects of the learning environment. In general, research being conducted on achievement goals has been guided by two different models: the goal orientation model, which assumes that a student's purpose (e.g., wanting to do well in a course…) stems from their *underlying reasons* for adopting the achievement goal (e.g., …*in order to* appear smart to others), and the goal standards model, which assumes that their purpose stems from the *standard of competence* they use to evaluate success (e.g., …*by* outperforming one's classmates; see Senko, 2016).

Both models contrast *mastery goals* with *performance goals*, but they emphasize different aspects of these goals and make different predictions about their adaptiveness. From the goal orientation perspective, mastery goals reflect an underlying desire to develop competence, while performance goals reflect a concern with demonstrating competence. In contrast, the goal standards model views mastery goals as involving a desire to meet a task- or self-based standard of success (e.g., answering at least 90% of the problems correctly, or scoring better on the second exam than on the first) and performance goals as involving a desire to meet a normative standard (e.g., performing better on an exam than most of one's peers). For both models, an approach-avoidance distinction can be made for each type of goal: students' performance and mastery goals can be aimed at attaining positive outcomes (e.g., they can strive to appear competent or outperform others—a performance-approach goal) or at preventing negative outcomes (e.g., they can try to avoid seeming incompetent or performing worse than others—a performance-avoidance goal).

Collapsing across these perspectives, research reviews have suggested that "mastery goals predict numerous desirable educational outcomes, and seldom any detriments, whereas performance-avoidance goals generally have the opposite pattern" (Senko, 2016, pp. 77–78; Urdan & Kaplan, 2020); however, see Hulleman et al. (2010) for evidence that (a) the positive association between certain measures of mastery goals and academic performance may be driven by non-goal factors and (b) performance-avoidance goals may *not* be maladaptive for students from Asian countries.

In general, the findings for mastery avoidance and performance approach goals are less consistent than the findings for mastery approach and performance-avoidance goals. A meta-analysis showed that when performance-approach goals were assessed in terms of wanting to appear competent (goal orientation perspective), they were related to maladaptive study behavior, such as self-handicapping and help avoidance, but when assessed in terms of wanting to outperform others (goal standards perspective), they were associated with adaptive behavior, such as self-regulation and the use of deep learning strategies (Senko & Dawson, 2017). To make sense of such findings, researchers have been examining a third model that integrates the goal orientation and goal standard perspectives (i.e., the goal complex model; see Senko, 2016; Sommet & Elliot, 2017).

Interventions

Given the current complexity of the achievement goal literature, it is perhaps unsurprising that there has been little recent intervention research grounded in achievement goal theory. Some

earlier intervention studies focused on changing classrooms to be more supportive of students' mastery goals, but had relatively modest results (see Urdan & Kaplan, 2020, for a review; see also Bardach et al., 2019). At least one other study focused on changing students' achievement goals more directly (e.g., by providing individualized feedback; Muis et al., 2013), with mixed results. Additional studies of achievement goal interventions are needed before drawing conclusions about the relative merits of these different approaches.

Impact

Achievement goal theory demonstrates that not only do the perceived causes of success and failure impact students' motivation (as posited by attribution theory, discussed next), but so do students' underlying interpretations of what qualifies as success versus failure. That is, two students can have the same goal of succeeding in class, but they may go about this in very different ways depending on their reasons for wanting to succeed and/or how they think success should be evaluated. Furthermore, because achievement goal theory is rooted in students' beliefs and interpretations, which are relatively malleable, it has enabled researchers to focus more on aspects of the environment that elicit particular types of goals—compared to earlier motivation theories, which tended to focus on stable motives and dispositions (Urdan & Kaplan, 2020).

Attribution Theory

Theory

Within educational psychology, attribution theory focuses on the inferences that students make about the causes of their achievement-related successes and failures, as well as the consequences of these inferences for their emotions and later behavior (e.g., see Graham, 2020). According to Weiner (1979), the causes to which people attribute their successes and failures (i.e., their attributions) can be classified along three central dimensions: (1) *locus*, or whether the cause originates from an internal or external source (e.g., "am I responsible for the bad grade, or is it my teacher's fault?"), (2) *stability*, or how likely a cause is to change (e.g., "if I didn't work hard enough, will I do so again next time?"); and (3) *controllability*, or how much influence the person has over the cause (e.g., "if I performed poorly because of low ability, can I improve my ability?").

Although the different dimensions of attributions can have complex effects on students' subsequent emotions, expectancies, and performance, Graham (2020) outlined several key trends. First, attributions to stable causes can lead students to expect that similar outcomes will occur again in the future. For example, if a student attributes their poor exam performance to a low level of ability that they feel is unlikely to change, they may infer that they are unlikely to succeed in the future, and this may lead them to feel hopeless and avoid re-engaging in the task. Second, attributions to internal factors are associated with self-esteem and esteem-related emotions, such as pride. For example, attributing failure to an internal cause (especially if it is also perceived as stable or uncontrollable) can lower students' self-esteem. To the extent that students are aware of this, they may attempt to protect their self-esteem by engaging in self-handicapping behavior (see Schwinger et al., 2022). Finally, attributions of negative outcomes to controllable causes (that are also internal) can lead students to experience feelings of guilt, whereas attributions of similar outcomes to uncontrollable/internal causes may instead result in feelings of shame. While guilt is sometimes associated with taking responsibility and making amends for one's actions, shame may instead lead the individual to withdraw and disengage from the situation.

Interventions

Drawing on attribution theory, researchers have designed interventions that aim to bolster students' motivation by helping them reframe the causes of events as controllable and/or unstable (see Graham & Taylor, 2022; Harackiewicz & Priniski, 2018). These attribution retraining interventions, which often ask students to engage in reflection about the causes of their academic successes or failures, have been shown to help both school-aged students and undergraduates form more adaptive attributions and improve their academic performance, although sometimes the effects are limited to lower-performing students (e.g., Hamm et al., 2020; see Graham & Taylor, 2022, for a review).

Impact

Early behaviorist accounts of student performance (e.g., Skinner, 1984) argued that rewarding a behavior makes it more likely that students will repeat it while punishing the behavior makes it less likely. In contrast, attribution theory established that "both reward and punishment can have positive or negative motivational consequences depending on the perceived causes of those outcomes" (Weiner, 2010, p. 29). The idea that individuals' *interpretations* of events shape their motivation, as opposed to certain types of events affecting all students similarly, underlies most contemporary theories of motivation, including those discussed previously. One theory that attribution research has had a particularly strong influence on is mindset theory.

Mindset Theory

Theory

Building on attribution theory, mindset research (Dweck & Leggett, 1988; Dweck & Yeager, 2021) suggests that there are individual differences in how people locate intellectual ability along the dimensions of stability and controllability. Some individuals consider ability to be malleable (i.e., controllable and potentially less stable), and this *growth mindset* makes them more likely to respond in an adaptive manner to experiences of negative feedback and failure compared to individuals who view ability as unchangeable (i.e., a *fixed mindset*). In addition to being related to attribution theory, mindset theory is also closely related to achievement goal theory. Dweck and colleagues have long maintained that individuals with a growth mindset are more likely than those with a fixed mindset to adopt mastery goals and less likely to adopt performance goals (Dweck & Leggett, 1988). A meta-analysis by Burnette et al. (2013) supported this claim and also showed that growth mindsets (relative to fixed mindsets) were positively associated with the use of mastery-oriented strategies (e.g., increasing practice time) and expectancies for success, and negatively associated with the use of helpless-oriented strategies (e.g., procrastination) and negative emotions (see also Dweck & Yeager, 2021). Furthermore, some of these associations were found to be stronger in contexts that involved an ego threat (e.g., failure feedback). Notably, the average correlation between growth mindsets and goal achievement (including academic performance) appears to be positive but small (Burnette et al., 2013; Sisk et al., 2018; cf. Dweck & Yeager, 2021), though consequential moderators of this association have been identified (e.g., student age).

Interventions

A growing body of intervention research has attempted to change the mindset beliefs that students draw on when responding to failure and negative feedback. Intervention strategies

include engaging students in self-reflection about the importance of effort and presenting them with facts about how their brains can change through learning (see Dweck & Yeager, 2021, for a review). Recently, a major research and development effort (Yeager et al., 2016) culminated in a nationally representative mindset intervention study that included over 12,000 ninth-grade students (Yeager at al., 2019). The mindset intervention significantly improved the grades of low-achieving students. While there have been debates recently about the efficacy of growth mindset interventions (Burnette et al., 2022; Macnamara & Burgoyne, 2022), emerging research suggests that this may be more a question of when (e.g., for whom? under what conditions?) they do and do not work (Burnette et al., 2022; Tipton et al., 2022). For example, researchers have found that student-focused mindset interventions may be most effective when students are situated in school contexts that support a growth mindset message, and can be only weakly effective or even ineffective when such conditions are not present (Walton & Yeager, 2020; Yeager et al., 2019, 2022; cf. Porter et al., 2022).

Impact

Of all the theories discussed in this section, mindset theory has probably had the greatest impact on laypeople's understanding of student motivation. Carol Dweck's popular trade book (Dweck, 2006), public appearances (e.g., Dweck, 2014), and company (i.e., mindsetworks.com), along with some recent mindset studies conducted with parents and teachers (e.g., Gunderson et al., 2018; Porter et al., 2022), have demonstrated to caregivers that they can play an important role in shaping students' motivational beliefs. Additionally, the careful development of growth mindset interventions by Dweck and Yeager (2021) has shown that (a) low-cost motivational interventions can be successfully implemented at scale, and (b) large-scale implementations of an intervention provide unique opportunities to systematically examine whether certain contextual and school-level factors moderate the intervention's effectiveness (e.g., see Burnette et al., 2022; Macnamara & Burgoyne, 2022; Tipton et al., 2022, for a debate about the generality versus specificity of these effects).

Recent Advances and Future Directions

The theories described in the previous section have helped to establish a standard (and perhaps even canonical) set of factors that many educational psychologists turn to when investigating the determinants of students' academic motivation. Indeed, numerous meta-analyses have shown that these factors are, *on average*, predictive of key academic outcomes (e.g., grades, retention). However, the same studies indicate that the factors often predict only modest to moderate amounts of the observed variance in these outcomes (e.g., Kriegbaum et al., 2018; Richardson et al., 2012; Robbins et al., 2004; Senko & Dawson, 2017; Sisk et al., 2018), though exceptions do exist (e.g., the relation between autonomous motivation and engagement; Howard et al., 2021). In addition, the interventions that have been designed to enhance these factors (e.g., growth mindsets, utility value) do not appear to have consistent effects across a broad range of populations and contexts (Binning & Browman, 2020; Bryan et al., 2021).

One reason for this may be because, historically, researchers have operated under the assumption that motivation is an all-purpose energy that varies primarily in terms of its strength, amount, or quantity (see Higgins, 2012). From this perspective, the source of an individual's motivation (e.g., intrinsic value vs. extrinsic incentives) is not particularly important for understanding how it will be experienced or how it will affect the person's behavior—as long

as the overall amount of motivation to perform a particular task is sufficiently high, the individual will persist at it when challenges arise. The primary role of motivation theories that have adopted this perspective is to identify predictive factors that are linearly associated with the strength of an individual's motivation across a broad range of tasks and contexts. Even in the rare case where a theory does posit that there are qualitatively distinct types of motivation that stem from different sources (e.g., SDT), it may assume that one of these types (e.g., autonomous motivation) is generally more beneficial than the others (e.g., controlled motivation) and, thus, like the other theories, focus on identifying factors that either promote or undermine this optimal motivation across a broad range of tasks and contexts.

Increasingly, this perspective is being called into question. That is, researchers have been less willing to assume that the motivation derived from a particular source (e.g., growth mindsets, mastery goals, utility value) will generally benefit all students across all contexts. And, this has led them to explore the complex relations between culture, identity, motivation, and behavior in novel ways. We highlight several of these advances in the present section.

Alternative Ontological Approaches to Investigating Motivation

One way in which the field has sought to capture more of the variation in student motivation is simply to examine the relations between well-established motivational predictors (e.g., intrinsic value, self-efficacy) and outcomes (e.g., standardized test scores) across a broader range of populations and contexts (e.g., Li et al., 2021). However, some researchers have questioned whether this approach is still too narrow. To formulate their critiques, they have drawn on two distinct but complementary perspectives: the *situative* approach to studying learning, and the *complex dynamic systems (CDS)* framework. Although these approaches are by no means new, they have only recently gained traction when it comes to explaining the disparate ways in which students become motivated to engage in academic tasks. Our reason for highlighting these approaches is not because we believe that more mainstream social cognitive approaches to studying motivation should be abandoned, but because these alternate perspectives may help researchers grapple with some of the contextual nuance and complexity that is typically ignored within the motivation literature.

The Situative Approach

The situative perspective posits that human functioning, including learning and motivation, is best understood in terms of the various socially-constructed systems of meaning that guide people's participation in particular activities. These systems extend beyond the physical contexts in which the activities take place, and include the overlapping communities, cultures, affinity groups, and organizations that the individuals have been exposed to (and contributed to) throughout their development. So, for example, when attempting to understand what will motivate a particular sixth-grade student to engage in a writing task, it is not enough to simply characterize the climate of the classroom in which the task was assigned in terms of one or two salient dimensions (e.g., a mastery vs. performance classroom goal structure; Bardach et al., 2019). Instead, from a situative perspective, it is important to understand how salient aspects of a student's identity affect (a) the way they get positioned in the classroom (e.g., does the student's teacher convey certain performance expectations based on the student's race, ethnicity, gender, or socioeconomic status), and (b) the narratives they construct about what kind of person they are or what they want to achieve in the class (e.g., has the student internalized the belief that children like them are less capable of succeeding at a writing task, or care less

about succeeding, compared to other children). It is also important to understand how the student's participation in meaning systems outside of the classroom has shaped their personal narratives, as well as their interpretation of the writing task. If the student in our example happens to be an immigrant to the United States, their beliefs about which forms of expression are acceptable in an academic context may differ from the beliefs held by the majority of their classmates. And, because the student belongs to a generation of children raised on social media, they may feel more comfortable disclosing certain information about themselves in their writing compared to their teacher, who may have grown up without Facebook, TikTok, or even email.

Importantly, it should not be assumed that each of these contextual factors will influence the student's task motivation in a linear manner, such that we can simply add together the various positive and negative effects of these factors to determine how much the student will want to engage in the task. Rather, the "layered systems of meaning" associated with the student's immigrant identity, generational status, gender, and age (along with numerous other factors) may be "negotiated" by the student in complex ways that make it difficult to predict how interested in the writing task they will be, or whether their interest will influence their behavior in the same way as it might for other students (Nolen, 2020, p. 3; see also Nolen, this volume). This latter possibility is particularly difficult for researchers working within social cognitive frameworks to address. This is because the aim of social-cognitive theories is to identify a set of motivational variables (e.g., task values, self-efficacy, autonomy, attributions, achievement goals, etc.) that represent proximal causes of students' behavior across *all* contexts. It is one thing for these theories to emphasize that certain motivational variables are continually being influenced by a broad set of contextual factors—a point of emphasis that recently led Eccles et al. to add the term "situated" to the name of their theory (see Eccles & Wigfeld, 2020). However, it is quite another thing to entertain the idea that these variables may not even mean the same thing or influence behavior in the same way across contexts. For situative theorists, the processes that shape motivation cannot be separated from the contexts in which they unfold.

Consequently, researchers adopting a situative approach prefer to treat the "learner-in-context" as their primary unit of analysis. That is, rather than examining the ways in which motivation is typically impacted by certain contextual factors for most students, they try to understand the ways in which various factors take on unique motivational meanings for particular individuals (or groups of individuals) *within* particular contexts. In doing so, these researchers tend to rely less on traditional variable-centered methods of investigation (such as the statistical analysis of mean ratings from questionnaires) in favor of qualitative and mixed methods that afford a "thick description" (Geertz, 1973) of "local knowledge practices; material tools; interactions among participants; the nature of participation available to and desired by individuals; relation of those means and objects to individuals' personal and positional identities; and their affiliation to people, subject matter, and institutions" (Nolen et al., 2015, p. 235).

Importantly, this type of research can be conducted as an end in itself, or it can inform design-based research (DBR) efforts to iteratively develop motivationally-supportive interventions and learning environments (Nolen, this volume; Ryu, 2020). As an example, consider the intervention that Browman et al. (2022) designed with the aim of boosting academic motivation among a specific population: low-income Black high school seniors attending a school with historically low achievement rates. While the researchers' initial intentions (i.e., helping these students to see school as a pathway to a successful future) were aligned with a key tenet of SEVT (i.e., bolstering motivation by increasing the perceived utility value of school), they

were aware that what might seem like a viable path to some students might not seem particularly realistic to some of the students in this group. Thus, the research team began by conducting multiple rounds of focus groups and interviews with students and alumni from the specific school where they were planning to implement the intervention. The resulting conversations established that the common approach of highlighting college as the only school-based path to future success was not experienced as motivating for all of these students. Because the students and alumni were from low-income families, some of them believed that college was financially out of reach; and, because the students were in their last year of high school, some believed that it was too late to earn the kinds of grades they needed to gain entry to college. These insights led the researchers to develop an intervention that highlighted the fact that there are multiple school-based paths to success (e.g., attending a post-secondary vocational school *or* a college). They also informed the decision to have the intervention message be delivered by relatable role models (i.e., formerly low-income Black alumni who had experienced upward mobility as a direct result of their post-secondary education). This tailoring proved effective: those who heard about the existence of multiple education-based paths to future success (versus those who only heard about the college path) were more likely to see education as important for their futures and reported stronger academic intentions. This example illustrates that when researchers begin by exploring what a particular group of students finds to be motivating within a particular context, they can enhance their ability to predict and influence important outcomes.

The Complex Dynamic Systems (CDS) Approach

In line with the situative approach to investigating motivation, the CDS approach posits that a student's motivated behavior can only be fully understood by accounting for their interactions with other individuals, groups, institutions, and cultural artifacts as part of a complex sociocultural system. However, like other social perspectives on human development (e.g., Bronfenbrenner's bioecological model; Bronfenbrenner & Morris, 2006), the CDS approach also posits that each individual is themself a complex system of internal psychological components (e.g., beliefs, emotions, dispositions, etc.) nested within the broader sociocultural system. Importantly, what the CDS approach provides that may be missing from other social or systems-based perspectives is a conceptual framework for understanding the *dynamics* of a hierarchically nested set of complex systems in which the components interact within and across levels in a reciprocal and nonlinear manner (see Marchand & Hilpert, this volume, for a review).

At the heart of this framework is the concept of *self-organization*, which refers to the ways in which the continuous and changing interactions between components of a complex system (whether that system is biological, psychological, or social in nature) precipitate the *emergence* of stable patterns or states (Thelen & Smith, 2006; Witherington, 2015). For example, motivation researchers operating from a CDS perspective have argued that the various social cognitive predictors of student motivation (e.g., fundamental needs, achievement goals, self-perceptions, epistemological beliefs, values, emotions, and behavioral strategies) can be thought of as components in a complex system that have the capacity under the right set of conditions to organize themselves into patterns or states that range from fleeting (e.g., a momentary urge to quit) to more stable (e.g., chronic amotivation; Kaplan et al., 2019; Miele et al., in press). Importantly, these states exhibit *holistic* properties that are more than just simple combinations of the system's underlying components. For example, from a CDS perspective, *flow* (i.e., the "subjective state that people report when they are completely involved

in something to the point of forgetting time, fatigue, and everything else but the activity itself"; Csikszentmihalyi et al., 2005, p. 230) can be posited as an emergent state in the motivational system that stems from interactions between the various constructs constituting the system (e.g., competence beliefs, perceptions of challenges, feelings of autonomy, interest, etc.). In this case, the experience of flow is not just about feeling competent, challenged, autonomous, and interested. For flow to occur, these constructs would need to organize themselves into a stable pattern of interaction within the individual. That is, to the extent that flow truly is an emergent state, it can be characterized not just by specific motivational constructs, but also by holistic properties of the overall pattern, which perhaps include the merging of action and awareness and an altered sense of time (Csikszentmihalyi et al., 2005).

Another important characteristic of complex systems is that their components often interact in a nonlinear manner. By nonlinear, CDS theorists mean that the interactions are reciprocal and/or recursive, such that the output of any particular interaction may feed back into the system in ways that are self-amplifying or constraining. As a result, the phenomena that emerge from these interactions (e.g., flow states) cannot be adequately explained in terms of the simple linear effect that one component has on another (i.e., in terms of "simple cause-effect logic"; Rowland, 2007, p. 10, as cited by Kaplan & Garner, 2017). Instead, "large inputs sometimes produce small results, and a small input at the right time can produce a dramatic result" (Guastello & Liebovitch, 2009, p. 1, as cited in Witherington, 2015). For example, when a student starts off working on a particularly *easy* activity that they find boring, a large increase in perceived challenge may not be enough to shift the experience of boredom to a state of flow; but, when working on a *moderately demanding* activity, even a *small* increase in perceived challenge can produce such a shift (Ceja & Navarro, 2012). Importantly, although the *input* to the system may vary quantitatively along a single dimension (i.e., perceived challenge), the *output* (i.e., change in motivational state) that emerges is qualitative in nature. In the case of our example, a small change in challenge gives rise to a qualitatively distinct state (i.e., flow), which can be characterized in terms of multiple holistic properties (e.g., sense of time, fatigue, etc.).

Given the sheer number of components that comprise a person's motivational system, as well as the complex relations between them, there is likely to be a vast number of patterns that the system can organize itself into and thus a vast number of different motivational states individuals might experience (e.g., amotivation, flow, an autonomous prevention focus, and so on; see Miele et al., in press). That being said, the CDS approach suggests that some patterns are more probable than others within a particular environment, given the individual's developmental history, as well as certain biological and environmental constraints. These patterns are often described as *attractor states* because the self-organizing components of the system appear to be more "attracted" to certain patterns of synchronization than others. For example, a recent study by Schweder and Raufelder (2022) used latent profiles analysis (LPA) and latent transition analysis (LTA) to identify common configurations of motivation components in a sample of adolescent students at four times during the school year. They found that a profile that included high levels of topic interest, self-efficacy, utility value, and effort emerged more frequently at the initial time point than a profile that included low interest, high self-efficacy, and moderate levels of utility value and effort. Furthermore, the low interest–high self-efficacy profile did not emerge in the LPAs conducted at the later three time points, which suggests that this profile may have changed from a weak attractor state in students' motivational landscapes to a *repellor state* (i.e., a state that the system has a tendency to move away from). However, it is important to note that inferences about attractor states based on LPAs and LTAs should be made with caution, as the results of such analyses involve identifying common configurations

of components *at particular points in time across individuals*, in contrast to the more CDS-aligned approach of identifying patterns of interactions between components that *emerge over time within the same individual* (see Hilpert & Marchand, 2018).

For educational psychologists, the CDS perspective suggests a number of new directions for motivation research. First, researchers can begin to identify the strongest and most common attractor states for a particular group of students in a given context (i.e., the within-person patterns of motivational factors that emerge most frequently across students in that context). Second, they can attempt to understand how these patterns differ from each other in terms of their holistic properties and determine whether particular properties are adaptive or maladaptive within specific contexts. For example, the holistic properties that may be unique to flow states (i.e., the merging of action and awareness, an altered sense of time) are assumed to be beneficial in most performance contexts; however, there may be situations in which this all-consuming task absorption may actually be maladaptive because it prevents students from redirecting their attention to other important goals (Pham & Duff, 2022). To the extent that researchers are interested in fostering particular motivational states within a given context, a third direction is to identify variables (known as *control parameters*; Hilpert & Marchand, 2018) that trigger changes in the way that the components of the motivational system organize themselves, thus eliciting the kinds of qualitative shifts described above. In our previous example illustrating the nonlinear relations between perceived challenge, boredom, and flow, task difficulty can be considered a control parameter of the system. As Kaplan et al. (2019) have suggested, it is likely that a number of control parameters are components of the broader sociocultural system in which the motivational system is nested. Thus, in line with the situative perspective described in the previous section, the individual and the context should not be studied separately from each other.

That being said, there are some important differences between the situative and CDS approaches. Unlike the situative approach, the CDS approach assumes that the processes and patterns in a complex system can be characterized in terms of "a common set of principles and mathematical formalisms" (Thelen & Smith, 2006, p. 271). Relatedly, the CDS approach employs quantitative methods for analyzing data that draw on these formalisms (e.g., the types of nonlinear equation-based modeling techniques described by Hilpert & Marchand, 2018), whereas the situative approach relies more on qualitative methods that involve compiling "thick descriptions" of learners in context. The implications of both the situative and CDS approaches for future research on motivation are explored in the remaining sections of this chapter.

Centering Race, Ethnicity, and Culture in Motivational Research

As discussed in the previous section, both the situative and CDS approaches assume that certain motivational processes (e.g., the influence of task values on student engagement) are *not* universally applicable across populations and, thus, certain psychological variables cannot be defined, measured, and expected to function in the same way among members of any social or cultural group. To the extent that this is true, it is especially problematic that research on motivation has (a) overwhelmingly focused on populations representing a very small subset of the global population—specifically, White, highly-educated, middle- and upper-class American, European, and Australian students (DeCuir-Gunby, this volume; DeCuir-Gunby & Schutz, 2014; Graham, 1992; Zusho & Clayton, 2011; Zusho & King, this volume), and (b) primarily been conducted by researchers who are members of these privileged groups (Roberts et al., 2020; Usher, 2018). It is equally concerning that when psychological research

focusing on minoritized groups is conducted, it "is often rendered as second-class research, critiqued as social advocacy work, and relegated to less prestigious journals or niche special issues on culture" (Matthews & López, 2020, p. 2). Although such concerns are not new (e.g., Graham, 1992), they have received substantially more attention in recent years.

One way in which the "Whiteness of motivation research" (Usher, 2018, p. 131) may undermine efforts to support students with marginalized identities is by reinforcing the "deficit thinking" of the researchers and educators who work with these students. Specifically, when researchers (a) create and norm measures of motivation constructs (e.g., expectancies, utility value, autonomy, etc.) with homogeneous samples of middle- and upper-class White students from the U.S., Europe, and Australia and (b) conduct studies showing that these measures are positively associated with achievement outcomes, people may come to assume that *all* students who score low on these measures (including students from groups not included in the original research) are inherently deficient in some way (see DeCuir-Gunby, this volume; DeCuir-Gunby & Schutz, 2014; Matthews & López, 2020; Patton Davis & Museus, 2019; Usher, 2018; Zusho & Clayton, 2011). Unfortunately, psychology has a long history of fostering this type of deficit thinking, including in the motivational domain. Examples include the field's development in the 1900s of "IQ tests" for assessing innate intellectual ability (at least in the U.S.; see Matthews & López, 2020; Omori, 2018) and its focus in the 1950-60s on familial characteristics that contributed to children's "need for achievement" (see Graham, 1994). In both cases, measures of these constructs were initially developed with relatively privileged and racially homogenous samples of participants. Later, when groups of racially and economically marginalized students scored lower than the norms that were established with these samples, it was argued that the students possessed deficient levels of intelligence or achievement motivation.

In recent years, researchers have sought to decenter the Whiteness of motivation research by attempting to "reimage" key motivational theories from the perspective of underexamined groups of students—a goal that aligns with the situative approach described earlier. As Matthews and López (2020) explained, "race-reimaging begins with the psychological construct in question (e.g., sense of belonging, self-efficacy) and infuses sociocultural values to reimage what the construct actually means for a specific cultural group." In doing so, it "encourages us to 'see' the psychological construct through the eyes of the group we are studying in order to understand both the generalizable and culturally-nuanced elements of that construct" (p. 2; for reviews, see DeCuir-Gunby, this volume; DeCuir-Gunby & Schutz, 2014).

Contrary to universalist assumptions, the reimaging perspective seeks to draw attention to the fact that some of the constructs posited by the previously reviewed theories may not be experienced or interpreted in the same way by students from different groups or cultures (see Zusho & King, this volume; King et al., 2018). For example, with regard to SEVT, measures of the utility value of an academic subject (e.g., STEM classes) often include items that assess the extent to which a student perceives the content as related to their *personal* academic/ career plans (e.g., "The course material is relevant to my future career plans"; Hulleman et al., 2017); and, on average, these measures have been shown to predict academic outcomes in White middle- and upper-class samples. In contrast, Gray et al. (2020) posited "that students of color are not drawn to scholastic activities solely for self-oriented reasons" and, thus, focused on the extent to which Black middle schoolers perceived their STEM classes as providing *communal* learning opportunities (e.g., "Today's lesson was important for learning how to help other people"). The results of their study showed that these perceived opportunities significantly predicted students' behavioral engagement in their STEM classes (see also Kumar et al., 2018).

(e.g., participatory action research; Brion-Meisels & Alter, 2018), whereby non-academic members of the community are invited to participate in key aspects of the research process, including formulating the very questions that the research team will go on to investigate.

To be clear, we are not arguing that prominent motivational theories are wholly invalid or irrelevant for understanding the motivation of students who are not White, middle- and upper-class, and from the U.S., Europe, or Australia. In fact, many tenets of the foundational theories discussed above have been replicated with historically understudied populations (see King et al., 2018). However, the issues and findings discussed above highlight the importance of considering who will (and will not) be a part of our samples and research teams. To that end, we join our colleagues from other areas of psychology in recommending that educational psychologists begin to include statements regarding "constraints on generality" in all articles describing empirical research (see Simons et al., 2017). In these statements, researchers are asked to explicitly specify which populations they expect the results to generalize to and which they do not. This information can be helpful for researchers conducting replication studies, for those interested in extending their research to novel groups and contexts, and for those looking to use the findings with real students in applied settings. In addition, the statements could be expanded to include information about the researchers' positionality, thus helping them to be self-reflective and transparent about their "own social locations and how this shapes [their] cognitions, values, epistemologies, ontologies, and meaning-making when [they] engage in knowledge production" (López et al., 2018, p. 186; for a related approach, see Fong et al., 2019a, Table 1).

The Heterogeneity and Context-Dependence of Motivational Interventions

One of the ultimate goals of motivation research in educational psychology is to develop and implement educational interventions and policies that can enhance student motivation and close achievement gaps in real-world academic settings. However, a corollary of the universalist assumption described above is that interventions based on the previously reviewed motivational theories should be equally effective for all students under all conditions. Thus, for years, research on motivational interventions tended to focus on average, between-condition (intervention versus control) effects. Although today it is more common than it had been for researchers to compare the effects of an intervention on minoritized versus non-minoritized students, the first group is often an aggregate of several distinct subgroups (e.g., Black, Latinx, Indigenous, first-generation, low-income, free/reduced lunch, etc.). In such instances, then, minoritized status is essentially treated as a monolithic "error-free indicator of a set of values, beliefs, institutions, and behaviors that can 'distinguish one group from another'" (Usher, 2018, p. 138; see also Schutz, 2020).

As an example of why this can be problematic, consider the findings from Jack's (2014) sociological study of low-income Black students at an elite university. While some of these students had attended under-resourced high schools in economically distressed communities, others had attended highly-resourced boarding, day, and preparatory high schools in predominantly White and wealthy neighborhoods. Because the latter group had high school experiences that were culturally and socially similar to their lives at the university, they tended to report greater feelings of belonging on campus. Thus, if researchers were to conduct a belonging intervention with students at this university, it seems unlikely that all of the low-income Black students would respond in the same way. Unfortunately, this type of sociocultural nuance is rarely accounted for in intervention research, as researchers typically focus on simple group × condition interaction effects. One notable exception is a study by Harackiewicz et al.

(2016), which demonstrated that a utility value intervention was effective for underrepresented racial-ethnic minoritized students from first-generation backgrounds, but not for minoritized students from continuing-generation backgrounds. Such studies demonstrate the importance of examining *treatment heterogeneity* or variation in the effects of a given intervention when applied to diverse samples of students (see Binning & Browman, 2020; Bryan et al., 2021).

The concept of treatment heterogeneity can also be applied to the variation that exists across the different learning contexts in which the intervention is being implemented. A powerful demonstration of this point comes from the mindset literature. As described above, growth mindset interventions are designed to teach students that intellectual growth is possible, and such interventions have been shown to boost academic performance among struggling students. However, in recent years, researchers have increasingly found that such interventions can be ineffective when students' academic environments do not "align with the messages of the intervention" (Yeager et al., 2019, p. 364). More specifically, Yeager et al. have found that if the day-to-day messages that students are exposed to in their learning environment oppose or contradict the messages of the growth mindset intervention—such as when the norm amongst their peers is to avoid academic challenges (Yeager et al., 2019), their teachers believe that intellectual ability is fixed (Canning et al., 2019a; Yeager et al., 2022), or the person leading the intervention is deemed untrustworthy (Yeager et al., 2014)—the intervention's benefits may be nullified. In line with the situative and CDS approaches described above, these findings demonstrate that motivation interventions should be considered context-dependent tools— they have the *potential* to improve academic outcomes, but only *when supportive conditions exist in the educational environment*. Walton and Yeager (2020) provide an illustrative analogy: "change requires planting good seeds (more adaptive perspectives) in fertile soil in which those seeds can grow (a context with appropriate affordances)" (p. 219).

Although motivational interventions that are implemented in supportive conditions do show reliable effects for particular groups of students, some researchers consider these effects to still be relatively small (see Miller, 2019, for a review; but, for counterarguments, see Kraft, 2020; Yeager et al., 2019). Perhaps one reason the effects are not larger is because they tend to target a single component of the system (e.g., utility value or mindset beliefs), with the expectation that an increase in this component will lead to a proportional rise in the students' motivation. From a CDS perspective, the motivational system includes many factors interacting with each other in a complex (i.e., reciprocal and nonlinear) manner. Thus, targeting just one component may be unlikely to produce a substantial change in the emergent properties of the system that are predictive of achievement (e.g., perseverance, cognitive engagement, etc.).

On the other hand, if the component targeted by an intervention happens to serve as a control parameter for the system (see above), then small changes in the component may actually result in large qualitative shifts in motivation. Such a possibility is actually consistent with arguments made by Walton and Wilson (2018) about the recursive nature of "wise" interventions — that small shifts in certain components (e.g., students' mindsets beliefs or sense of belonging) can trigger self-sustaining and self-amplifying processes that result in relatively large changes to the students' meaning systems and motivation. The problem, however, is that without a deeper understanding of the dynamic properties of the motivational system, it can be difficult "to tell which external factors merely affect behavior quantitatively and which factors change the class of behavior (e.g., change the system from one type of pattern to another)" (Vallacher & Nowak, 1997, p. 79). In other words, it is possible that mindset beliefs and other factors targeted by common motivation interventions do serve as control parameters for the motivational system, but it is also possible that they play a more limited role when it comes to changing the system's behavior. If we hope to distinguish between these

possibilities, additional research is needed that examines the "theoretical principles of the motivation system's dynamic behavior" (Kaplan, 2023, p. 451). Such research would not only help investigators to better understand and refine existing motivational interventions, but would also aid them in exploring new types of interventions—ones that do not "rely on deterministic prediction and control to 'fix' motivation (like a mechanic fixing a car)," but instead "introduce change into the system that could be anticipated to shift its emergence towards a more desirable direction (like a gardener trying to revive a garden)" (Kaplan, 2023, p. 451).

Regulating Multiple Dimensions of Motivation

Given that motivation is a complex phenomenon that varies substantially between individuals and across contexts, constructing interventions that aim to bolster narrow aspects of students' motivation (e.g., utility value) within specific contexts (e.g., their biology class) may not always be the most efficient means of supporting their development. Instead, it may be better to provide students with the skills and strategies they need to assess the demands of whatever situation they happen to be in and then shift themselves into a motivational state that will help them to meet these demands. Although few interventions exist that explicitly teach these skills to students, research examining *motivation regulation* is growing and investigators are developing a better understanding of the basic processes by which students monitor and control their task motivation and engagement.

Existing research on students' motivation regulation has largely focused on identifying the strategies that students use to bolster particular components of their motivation (e.g., perceived self-efficacy, intrinsic value, attainment value) when they feel like quitting. This work has shown that students' self-reported use of these strategies is predictive of important academic behaviors and outcomes, such as task persistence, metacognitive self-regulation, and achievement (see Miele & Scholer, 2018; Wolters, 2003). Interestingly, very little of this research has investigated students' reasons for choosing certain strategies over others within a particular context. This could be due to the previously described tendency of researchers to view motivation (or at least some "optimal" form of motivation) as a unidimensional construct that can be increased by targeting a limited set of proximal causes, regardless of context. If motivation regulation is simply about increasing the overall strength of one's motivation, then the different types of regulation strategies may be seen as relatively interchangeable.

If, on the other hand, motivation is an emergent phenomenon that can take many different forms, then regulating one's motivation may involve shifting between qualitatively distinct states and not just strengthening a single state. This possibility is the primary focus of the metamotivational approach to studying motivation regulation (Miele et al., 2020; Scholer et al., 2018). Researchers who take this approach assume that the motivational states that individuals are most likely to experience (i.e., the "attractor states" in their motivational landscape) vary along a number of different macro-level dimensions (see Miele et al., in press)—some that are well-known in the educational psychology literature (e.g., autonomy vs. control), but others that have been more frequently explored by social psychologists (e.g., promotion vs. prevention; high- vs. low-level construal; Higgins, 1997; Trope & Liberman, 2010). Furthermore, the poles of each dimension are thought to relate to particular modes of information processing and patterns of behavior that may be more adaptive for some kinds of tasks than for others. For example, intrinsic motivation appears to be related to the kind of deep processing that may be especially adaptive for open-ended tasks (i.e., tasks that require novel or thoughtful responding), whereas incentive-based motivation seems more closely related to the

kind of narrow attention that may be adaptive for close-ended tasks (i.e., tasks that require rote or repetitive responding; see Cerasoli et al., 2014).

One aim of recent metamotivation studies has been to assess whether people possess normatively accurate knowledge about the performance tradeoffs associated with these different dimensions of motivation. The results of these studies suggest that, on average, college students and other adults do possess this knowledge when it comes to the dimensions of autonomy vs. control, promotion vs. prevention, and high- vs. low-level construal. Furthermore, with respect to the latter two dimensions, this knowledge has been shown to generalize across cultures and to predict students' grades in an introductory psychology course (see Miele et al., 2020, for a review). That being said, research on metamotivational knowledge is still in its infancy, and more studies are needed that examine it as a predictor of engagement and performance across a broad range of ages and educational contexts. For a novel study that takes a different approach to assessing students' metamotivational knowledge and its correlates, see Bäulke et al. (2021).

Another important direction for future research on motivation regulation is to examine how students manage their simultaneous pursuit of multiple goals. Past studies have typically focused on predictors of students' motivation to pursue individual goals (e.g., to successfully complete a task or pursue a particular major), as well as the strategies they use to sustain this motivation. However, to the extent that students' motivation is best understood as arising from a complex system of intersecting goals and needs, it is important to understand how students go about bringing these goals and needs into alignment, especially when they are perceived as conflicting with each other. Scholars from a number of different research traditions have begun to explore this topic (e.g., Grund et al., 2018; Kim et al., 2021; Kung & Scholer, 2020).

New Methods for Investigating Motivation

As should be clear by this point in the chapter, a major advance in the motivation literature over the past ten years has been to explore some of the complexity of motivational phenomena that had previously been ignored. Because this exploration has been guided, in part, by novel ontological approaches (e.g., the situative and CDS perspectives, described above), it has required researchers to go beyond traditional methods that involve examining linear relations between variables. In particular, we have noticed a substantial uptick in researchers' use of person-centered approaches (e.g., latent variable mixture modeling; see Harring & Hodis, 2016) and experience sampling methods (e.g., daily diaries) over the past ten years (Zirkel et al., 2015). Still, there are numerous additional methods for exploring motivational complexity that have not yet gained traction within the educational psychology literature. We, therefore, recommend that researchers who are interested in exploring motivation as an emergent phenomenon review the various CDS-related methods summarized by Hilpert and Marchand (2018), such as social network analysis, agent-based modeling, and dynamic modeling. In addition, researchers who are particularly focused on investigating the "socially and historically situated contexts of classrooms, schools, and educational systems" should review the articles in the recent special issue of *Educational Psychologist*, which explored qualitative and mixed-methods research (Meyer & Schutz, 2020, p. 193). Finally, computationally savvy researchers may want to explore the use of advanced automated techniques (e.g., machine learning) that have been recommended for exploring the complexity of motivation-related phenomena (see D'Mello et al., 2017, for a review and Donnellan et al., 2021, for an illustrative example).

Conclusion

In the years since the previous edition of the *Handbook of Educational Psychology* was published, research on student motivation has continued "to be a vibrant and productive area of study" (Linnenbrink-Garcia & Patall, 2016, p. 99). Although advances are still being made to the prominent motivational theories discussed in this chapter, there has been a strong shift toward developing theory-based interventions aimed at enhancing students' motivation and achievement. Although we welcome this focus on application, we believe that more work is needed to refine and integrate the various theories we have reviewed. Indeed, the considerable overlap between certain concepts (e.g., interest, intrinsic value, and intrinsic motivation) has led some scholars to ask, "do we need all of these theories and constructs?" (Anderman, 2020, p. 4). Our own view is yes: each of the theories discussed in this chapter does make a unique contribution to our understanding of student motivation. However, as discussed in the latter half of the chapter, we join many contemporary motivation researchers in calling for better explanations of (a) how constructs from one theory relate to constructs from other theories as part of a complex motivational system and (b) how the functioning and interrelations of these constructs vary from one student, group, context, or time point to another. Ultimately, such advances could lead researchers to broaden their theoretical perspective, which may help them to develop novel interventions and contribute to innovative educational policies and practices that address important educational problems (see Anderman, 2020).

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