SELF-EFFICACY, MOTIVATION, AND ACHIEVEMENT IN SCHOOL FROM THE PERSPECTIVE OF RECIPROCAL DETERMINISM

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OVERVIEW OF SOCIAL COGNITIVE THEORY AND RECIPROCAL DETERMINISM

In the early 1940s, and at the height of the behaviorist movement in psychology, American psychologists put forth theories of social learning and imitation that rejected behaviorist notions of associationism in favor of drive reduction principles. These theories, however, failed to explain how individuals initiate novel behaviors or why they imitate the actions of others even when they are not directly reinforced for doing so. In 1963, Bandura and Walters (1963) published *Social Learning and Personality Development*, broadening the frontiers of traditional social learning theories with the now familiar principles of social modeling, observational learning, and vicarious reinforcement. With the publication of *Social Foundations of Thought and Action: A Social Cognitive Theory*, Bandura (1986) advanced a cognitive interactional model of human functioning that accords a central role to cognitive, vicarious, self-regulatory, and self-reflective processes in human adaptation and change. In this *social cognitive theory*, people are viewed as

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self-organizing, proactive, self-reflecting, and self-regulating rather than as reactive organisms shaped by environmental forces or driven by concealed inner impulses. From this agentic perspective, people are contributors to their life circumstances, not just products of them.

Social cognitive theory views human functioning as the product of a dynamic interplay of personal, behavioral, and environmental influences. For example, how people interpret the results of their own behavior informs and alters their environments and the personal factors they possess which, in turn, inform and alter subsequent behavior. This is the foundation of Bandura's (1986) conception of *reciprocal determinism*, the view that (a) personal factors in the form of cognition, affect, and biological events, (b) behavior, and (c) environmental influences create interactions that result in a *triadic reciprocality* (see Fig. 1). It bears emphasizing that Bandura (1978) defined the term "determinism" not in its typically understood sense that actions are caused by events that are out of an individual's control, but rather as the production of effects by events that are probabilistic rather than inevitable in nature. He also altered the label of his theory from social learning to social "cognitive" both to distance it from prevalent social learning theories of the day and to emphasize that cognition plays a critical role in people's capability to construct reality, self-regulate, encode information, and perform behaviors.

To better understand how these three mutually interacting forces can work to influence each other, imagine a middle school student in a typical math class. Twelve-year-old Johnny has had a history of difficulty with

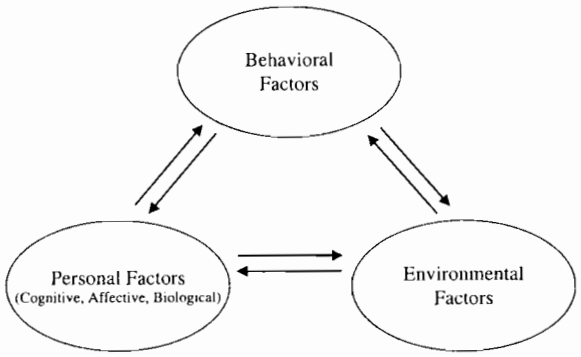

Fig. 1. Bandura's (1986) Triadic Reciprocal Determination Through the Dynamic Interplay of Personal, Behavioral, and Environmental Factors.

mathematics, a subject that has bedeviled him throughout elementary school such that he neither excels in it nor enjoys it. As he moves to middle school, his mathematics self-efficacy is understandably low, and he typically avoids engaging in the kinds of math tasks that could produce the learning and improvement he requires. Feeling defeated even before he begins a math assignment, he rushes through his homework and immediately surrenders to a difficult problem. He tells himself, and others, that he is "simply lousy at math." On entering his new 6th grade math class, however, Johnny discovers that Mrs. Miller is unlike any teacher he has ever had. She is attentive to his needs, works to diagnose his difficulties, and makes available to him a number of math "games" that both interest and delight him. Moreover, she chaperones his efforts with high expectations combined with encouragement and help. At one point, she teams Johnny with Grace, a more capable but supportive peer. Soon, Johnny begins to realize that he is not as bad with numbers as he had thought. Indeed, he can actually be pretty good with them. As his skills grow, so does his confidence in those skills. Under the warm attention of Mrs. Miller, Johnny's math grades improve dramatically, as of course does his attitude toward mathematics. He becomes an active class participant and seeks new challenges in mathematics.

In our example, note how environmental factors (Mrs. Miller, verbal persuasions, modeling from peer) interacting with and influencing personal factors (Johnny's attitude and confidence) can result in dramatic behavioral changes (Johnny perseveres in mathematics, seeks new challenges, participates in class, works with a peer, begins to have mastery experiences) that themselves interact with and influence subsequent environmental factors (Johnny's new attitude encourages Mrs. Miller to seek new challenges for him) and personal factors (Johnny's motivation toward mathematics improves dramatically, his self-regulatory practices improve in concert with his new-found success, he enjoys being in math class) that lead to further behavioral changes (Johnny joins the math club!). As we hope you will see, the interactions and reciprocal effects continue, weaving a tapestry of growing success in mathematics that would have earlier been unthinkable to our young scholar.

The reciprocal nature of the determinants of human functioning in social cognitive theory makes it possible for educational efforts to be directed at each of the three reciprocal determinants. Strategies for increasing well-being can be aimed at improving emotional, cognitive, or motivational processes, increasing behavioral competencies, or altering the social conditions under which people live and work. In school, for example, teachers have the challenge of improving the academic learning and confidence of the students in their charge. Using social cognitive theory as a

framework, teachers can work to improve their students' emotional states and to correct their faulty self-beliefs and habits of thinking (personal factors), improve their academic skills and self-regulatory practices (behavior), and alter the school and classroom structures that may work to undermine student success (environmental factors).

Bandura's social cognitive theory stands in clear contrast to theories of human functioning that overemphasize the role that environmental factors play in the development of human behavior and learning. Behaviorist theories, for example, show scant interest in self-processes because theorists assume that human functioning is caused by external stimuli. Inner processes are viewed as transmitting rather than causing behavior, thus they are dismissed as a redundant factor in the cause and effect process of behavior and unworthy of psychological inquiry. For Bandura, a psychology without introspection cannot aspire to explain the complexities of human functioning. It is by looking into their own conscious mind that people make sense of their own psychological processes. To predict how human behavior is influenced by environmental outcomes, it is critical to understand how the individual cognitively processes and interprets those outcomes. More than a century ago, William James (1890/1981) argued that "introspective observation is what we have to rely on first and foremost and always" (p. 185). For Bandura (1986), "a theory that denies that thoughts can regulate actions does not lend itself readily to the explanation of complex human behavior" (p. 15).

Similarly, social cognitive theory differs from theories of human functioning that overemphasize the influence of biological factors in human development and adaptation. Although it acknowledges the influence of evolutionary factors in human adaptation and change, it rejects the type of evolutionism that views social behavior as the product of evolved biology but fails to account for the influence that social and technological innovations that create new environmental selection pressures for adaptiveness have on biological evolution (Bussey & Bandura, 1999). Instead, the theory espouses a bidirectional influence in which evolutionary pressures alter human development such that individuals are able to create increasingly complex environmental innovations. These innovations themselves create selection pressures for the evolution of specialized biological systems for functional consciousness, thought, language, and symbolic communication. This bidirectional influence results in the remarkable intercultural and intracultural diversity evident in our planet.

Social cognitive theory is rooted in a view of human functioning in which individuals are agents proactively engaged in their own development and

can make things happen by their actions. They are "partial architects of their own destinies" (Bandura, 1997, p. 8). Key to this sense of agency, individuals possess self-beliefs that enable them to exercise a measure of control over their thoughts, feelings, and actions. Bandura (1986) provided a view of human behavior in which the beliefs that people have about themselves are critical elements in the exercise of control and personal agency – "what people think, believe, and feel affects how they behave" (p. 25). Thus, individuals are viewed both as products and as producers of their own environments and of their social systems.

Because human lives are not lived in isolation, Bandura (1986) expanded the conception of human agency to include collective agency. People work together on shared beliefs about their capabilities and common aspirations to better their lives. For example, in family, community, and work settings, success depends on the collective, interactive effect of group members. This conceptual extension makes the theory applicable to human adaptation and change in collectivistically oriented societies as well as individualistically oriented ones.

Rooted within Bandura's (1986, 2006) conception of reciprocal determinism is the understanding that individuals are imbued with agentic capabilities that define what it is to be human. Human agency comprises four core properties. Individuals are able to act *intentionally* through deliberate choices, to exercise *forethought* by visualizing goals and anticipating outcomes, and to *self-regulate* by developing appropriate courses of action (or inaction) needed to carry out required tasks.

But people are not only agents of their own actions, they also *self-reflect* by metacognitively examining their own functioning. For Bandura (1986, 2008), self-reflection is the most distinctly human capability, hence it is a prominent feature of social cognitive theory. Through self-refection, people make sense of their experiences, explore their own cognitions and self-beliefs, engage in self-evaluation, and alter their thinking and behavior accordingly. It is also through self-reflection that people make judgments about their capability to accomplish tasks and succeed in the many activities that comprise their lives.

SELF-EFFICACY BELIEFS IN SCHOOL CONTEXTS

Of all the thoughts that affect human functioning, and standing at the very core of social cognitive theory, are *self-efficacy* beliefs, which can be defined as the judgments that individuals hold about their capabilities to learn or

perform courses of action at designated levels. In school, self-efficacy beliefs focus on one's capabilities to learn or perform academic tasks. These beliefs can be relatively broad, as when referring to general beliefs that one has the skills and capabilities to succeed in school, to highly contextual, in that they can be focused on specific academic tasks, activities, and areas. Hence students have self-efficacy beliefs that can range from their overall mathematics capability, their ability to solve word problems, or even, at a basic level of mathematics, their ability to add and subtract single digits, or even to count. This contextual nature of self-efficacy beliefs has helped maximize self-efficacy's predictive utility across academic tasks, activities, school levels, and subject areas.

In school, self-efficacy beliefs provide the foundation for academic motivation, well-being, and achievement because, no matter what other factors may serve as motivators, "they are rooted in the core belief that one has the power to effect changes by one's actions" (Bandura, 2004, p. 622). Unless students believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties unless they are coerced into doing so. How far will an interest in architecture take a student who feels hopeless in geometry? Whatever factors operate to influence behavior, they are embedded in the core belief that one has the capability to accomplish that behavior. Typically, students will choose to engage in activities in which they feel competent and avoid those in which they do not. This is particularly critical at the high school and college levels, where young people progressively have more academic choices available to them.

Bandura's triadic model accounts for multiple factors that influence human functioning, and so academic motivation, cognition, and achievement are influenced by many factors. The success or failure that students experience as they engage in the myriad tasks that comprise their school life naturally influence the many decisions they must make. Also, the knowledge and skills they possess will certainly play critical roles in what they choose to do and not do. But it is important to emphasize that people must invariably *interpret* the results of their attainments just as they must make judgments about the quality of the knowledge and skills they possess. Imagine, for example, two students who receive a B on an important mathematics exam. In and of itself, a B has no inherent meaning, and certainly no causal properties. How will receiving such a grade affect a particular youngster? A student accustomed to receiving A's in math class and who worked hard throughout the term and studied for the exam will view the B in ways quite dissimilar from that of a student accustomed to receiving C's and who worked equally hard. For the former, the B will be received with distress; for the latter, the B is likely to be received with elation. The student accustomed to receiving A's is likely to have her mathematics self-efficacy bruised; the C-acquainted student is sure to have her self-efficacy boosted.

A critical contention of Bandura's (1986) social cognitive theory is that people's level of motivation and behavior is based more on what they believe than on what is objectively true. For this reason, how people behave is usually better determined by the beliefs they hold about their capabilities than by what they are actually capable of accomplishing, for these self-efficacy perceptions help determine what individuals do with the knowledge and skills they have. This helps explain why people's behaviors are often disjoined from their actual capabilities and why their behavior may differ widely even when they have similar knowledge and skills. Many talented people suffer frequent (and sometimes debilitating) bouts of self-doubt about capabilities they clearly possess, just as many individuals are confident about what they can accomplish despite possessing a modest repertoire of skills. As a consequence, people's accomplishments are generally better predicted by their self-efficacy beliefs than by their previous attainments, knowledge, or skills. And it bears noting that self-efficacy beliefs are themselves critical determinants of how well knowledge and skill are acquired in the first place.

It should not be inferred from this discussion that self-efficacy is the only, or even the most important, influence on academic achievement at any particular time or on any particular academic task or activity. High self-efficacy will not influence behavior when people do not value the outcomes that their actions will produce. Students with high self-efficacy may not attempt an activity if they lack the necessary resources or if they find themselves in prejudicially structured systems in which they perceive social constraints in their envisioned path or outcome and thus expect that their labors will bear little or no fruit. Also, goals motivate and direct behavior (Locke & Latham, 2002), and people often pursue a valued goal even when they have low self-efficacy for attaining it. In such cases, self-efficacy will fail to influence performance. An individual may feel capable but do nothing because he feels impeded by these real or imaginary constraints. Finally, students cannot accomplish tasks beyond their capabilities simply by believing that they can. No amount of self-efficacy will produce a competent performance when requisite skills are lacking. Competent functioning requires harmony between self-beliefs on the one hand and possessed skills and knowledge on the other. These and other factors notwithstanding, a wealth of research shows that self-efficacy can affect students'

motivation, achievement, and choice of activities across academic levels and domains.

Depending on what is being managed, the events over which personal influence is exercised may entail regulation of one's own motivation, thought processes, affective states and actions, or changing environmental conditions. Self-efficacy beliefs are sensitive to these contextual factors. As such, they differ from other expectancy beliefs in that self-efficacy judgments are both more task- and situation-specific and in that individuals make use of these judgments in reference to some type of goal. Consequently, self-efficacy is generally assessed at a more microanalytic level than are other expectancy constructs. Researchers assess self-efficacy beliefs by asking individuals to report the level, generality, and strength of their confidence to accomplish a task or succeed in a certain situation. In school settings, students may be asked to rate their confidence to solve mathematics problems, perform reading or writing tasks, or engage in self-regulatory strategies.

Self-efficacy beliefs should also not be confused with people's *outcome expectations*, which is to say their judgments of the consequences that their behavior will produce. Typically, self-efficacy beliefs help foster precisely the outcome one expects. Confident individuals anticipate successful outcomes. Students confident in their social skills anticipate successful social encounters. Those confident in their academic skills expect high marks on exams and expect the quality of their work to reap academic benefits. The opposite is true of those who lack confidence. People who doubt their social skills often envision rejection or ridicule even before they establish social contact. Students who lack confidence in their academic skills envision a low grade even before they begin an exam or enroll in a course. The expected results of these imagined performances will be differently envisioned: social success or greater career options for the former, social isolation or curtailed academic possibilities for the latter.

Students form their academic self-efficacy by interpreting information primarily from four sources (Bandura, 1997). The most influential source is the interpreted result of one's previous performance, or *mastery experience*. Outcomes interpreted as successful raise self-efficacy, whereas those interpreted as failures undermine it, although an occasional failure after many successes will not have much effect. Students also form self-efficacy perceptions through the *vicarious experience* of observing others. When students are uncertain about their own capabilities or when they have limited prior experience, they become more sensitive to what others do. Vicarious experience is particularly powerful when observers see similarities

in some attribute of the model and then assume that the model's performance is diagnostic of their own capability. Conversely, watching models with perceived similar attributes fail can undermine observers' beliefs about their own capabilities. It bears noting that students seek out models who possess qualities they admire and capabilities to which they aspire. A significant model in one's life can help instill self-beliefs that will influence the course and direction that life takes.

Academic self-efficacy is also influenced by the *social persuasions* and verbal judgments that students receive from others. But these persuasions should not be confused with knee-jerk praise or empty inspirational homilies. Effective persuaders must cultivate students' beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable. And just as positive persuasions may work to encourage and empower, negative persuasions can work to weaken self-efficacy. Finally, students also rely on their *physical and emotional states* when judging their academic efficacy. These states provide cues about the anticipated success or failure. Negative thoughts and fears, stress, tension, excessive anxiety, and weariness are read as signs of personal deficiencies and help trigger additional agitation that helps ensure the inadequate performance feared. Positive mood enhances self-efficacy: depressed mood diminishes it. Self-efficacy can be strengthened by reducing anxiety and depression, building physical strength and stamina, and changing negative misinterpretations of these states.

Information acquired from these sources does not influence self-efficacy automatically but rather is cognitively appraised. Self-efficacy appraisal is an inferential process in which persons weigh and combine the contributions of personal, environmental, and behavioral factors. In forming and modifying self-efficacy perceptions, students consider factors such as effort expended, task difficulty, assistance from others, and number and pattern of successes.

Because individuals operate collectively as well as individually, self-efficacy is both a personal and a social construct. Educational contexts can develop a sense of collective efficacy – a shared belief in a group's capability to attain goals and accomplish tasks. Classrooms and schools, even school clubs and academic departments, develop collective beliefs about the capability of students to learn, of teachers to teach and otherwise enhance the lives of students, and of administrators and policymakers to create environments conducive to these tasks. Schools and other educational groups with a strong sense of efficacy empower and vitalize their constituents.

RESEARCH FINDINGS ON SELF-EFFICACY IN SCHOOL CONTEXTS

Since Bandura (1977) first introduced the construct of self-efficacy, researchers have demonstrated that self-efficacy beliefs powerfully influence people's attainments in diverse fields. Self-efficacy has been especially prominent in educational contexts, where researchers have established that it is an excellent predictor of academic motivation and achievement. The depth of this support prompted Graham and Weiner (1996) to conclude that self-efficacy has proven to be a more consistent predictor of academic outcomes than have any other motivation constructs. As might be expected, most research efforts have examined unidirectional relationships between self-efficacy on the one hand and personal, environmental, and behavior constructs on the other, though the direction of interest has varied according to specific research questions in a given study (e.g., investigations of the sources of self-efficacy typically feature self-efficacy as the dependent variable).

In the following section, we examine research findings on self-efficacy in academic contexts from the perspective of its role in Bandura's (1986) model of triadic reciprocal determinism. We present findings from educational research that attest to self-efficacy as an interacting, mediational, and predictive component of Bandura's social cognitive framework. Our aim, however, is not to catalog the findings that speak to self-efficacy's prominence in predicting motivation and achievement in school. Rather, we situate these findings within Bandura's contentions regarding reciprocal causation. As such, we present findings as they relate to the relationship between self-efficacy on the one hand and various personal, environmental, and behavioral factors on the other. It bears noting at this juncture, however, that most researchers have focused on unidirectional effects between two of the three factors. Following our review of findings, we draw on obtained results and theoretical insights to offer suggestions that may guide subsequent research and chart avenues of inquiry into the dynamic interplay between self-efficacy, and personal, environmental, and behavioral determinants of academic functioning.

Self-Efficacy and Behavioral Factors

As Fig. 2 illustrates, behavioral factors in school contexts include academic achievement across domains, multiple school performances, effort,

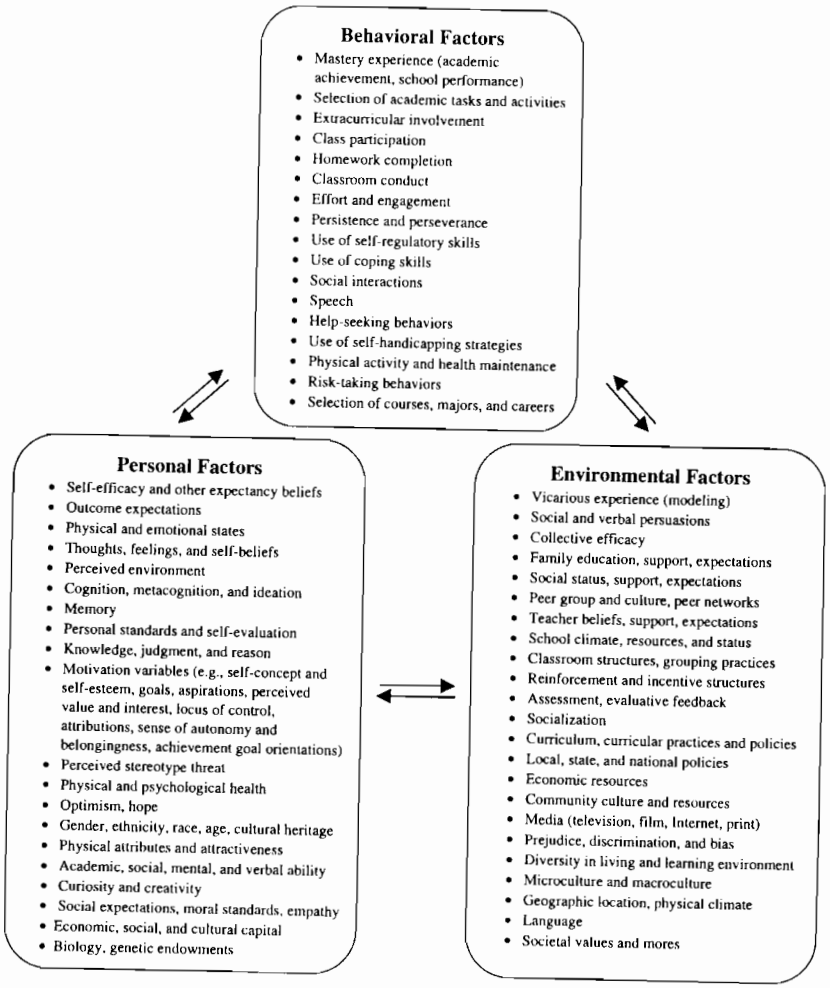

Fig. 2. Education-Related Examples of Interacting Factors Within Bandura's (1986) Model of Triadic Reciprocality.

persistence and perseverance, participation in school activities, use of self-regulatory strategies, and selection of courses, academic majors, and careers. Results of investigations during the past 30 years have demonstrated that students' beliefs about their academic capabilities powerfully predict myriad

academic behaviors (see Bandura, 1997; Pajares & Urdan, 2006; Schunk, 1995). In general, researchers have reported that, consistent with Bandura's (1997) contentions, self-efficacy beliefs help determine how much effort students will expend on an academic task or activity, how long they will persevere when confronting obstacles, and how resilient they will be in the face of adverse situations. The higher the sense of efficacy, the greater the effort, persistence, and resilience. As a consequence, self-efficacy beliefs can powerfully influence the level of accomplishment that one ultimately achieves.

In education, a meta-analysis of studies published between 1977 and 1988 revealed that self-efficacy beliefs were positively related to academic achievement (Multon, Brown, & Lent, 1991). Self-efficacy related to academic outcomes ($r_u = .38$) and accounted for approximately 14% of the variance. Effects were stronger for high school and college students than for elementary students. Stronger effects were obtained by researchers who compared efficacy judgments with cognitive skills measures of performance or classroom-based indexes such as grades than with global, standardized achievement tests. Effect sizes also were stronger in studies in which researchers developed concordant self-efficacy/performance indexes. In another meta-analysis, Stajkovic and Luthans (1998) found that the average weighted correlation between self-efficacy and work-related performance was (G)$r = .38$, which transforms to a 28% gain in performance due to self-efficacy.

Correlations between self-efficacy and academic performances in investigations in which self-efficacy corresponds to the criterial task with which it is compared have ranged from .49 to .70; direct effects in path analytic studies have ranged from $\beta = .349$ to .545 (Pajares & Schunk, 2001). Self-efficacy explains approximately 25% of the variance in the prediction of behavioral, academic outcomes beyond that of instructional influences. Self-efficacy is responsive to changes in instructional experiences and plays a causal role in students' development and use of academic competencies (Schunk, 1995). Indeed, self-efficacy is typically as good a predictor of academic success as are previous achievement or mental ability (Pajares & Kranzler, 1995).

Researchers have also demonstrated that self-efficacy influences self-regulatory processes such as goal setting, self-monitoring, self-evaluation, and strategy use (see Zimmerman, 1994, 2000, 2002; Zimmerman & Cleary, 2006, for reviews). Confident students embrace more challenging goals, engage in more effective self-regulatory strategies, and persist longer than do those who lack confidence. In studies of college students who pursue science

and engineering courses, high self-efficacy influences the academic persistence necessary to maintain high academic achievement (see Hackett, 1995). Academic self-efficacy is correlated with in-class seatwork and homework, exams and quizzes, and essays and reports. Pintrich and De Groot (1990) suggested that self-efficacy facilitates cognitive engagement such that raising self-efficacy likely leads to higher achievement by increasing use of cognitive strategies.

Self-efficacy beliefs influence the choice of majors and career decisions of college students. Undergraduates choose college majors and careers in areas in which they feel most competent and avoid those in which they believe themselves less competent or less able to compete. Researchers have also reported that the self-efficacy of college undergraduates is more predictive of their choice of courses and majors than is their previous achievement. In some cases, for example, young women avoid mathematics- and science-related courses and careers because they underestimate their capability rather than because they lack competence or skill (Hackett, 1995).

Researchers have also investigated the influence of behavioral factors on self-efficacy beliefs, although it bears noting that correlational results are too often inferred as causal. For example, learning goals that are specific, short-term, and viewed as challenging but attainable have been found to enhance students' self-efficacy better than goals that are general, long-term, or not viewed as attainable (Zimmerman, Bandura, & Martinez-Pons, 1992). Studies of goal setting have demonstrated that self-efficacy and skill development are stronger in students who set proximal goals than in those who set distal goals, in part because proximal attainments provide evidence of growing expertise (Bandura & Schunk, 1981; Locke & Latham, 2002). Students believe that they can more easily attain short-term goals, which offer clear standards against which to gauge progress. As students work on tasks, they compare their progress against their goals. The perception of progress strengthens self-efficacy and motivates students to continue to improve (Schunk, 1995).

Providing students with a strategy that helps them succeed can also raise self-efficacy. Students who believe they have the means for performing successfully are apt to feel efficacious about doing so. As they work on tasks and apply the strategy, they note their progress, which strengthens their self-efficacy. Having students verbalize the strategy as they apply it – especially in the early stages of learning – also raises self-efficacy because the verbalization directs students' attention to important task features, assists strategy encoding and retention, and helps them work systematically (Schunk, 1995).

The influence of two behavioral factors on self-efficacy has received the lion's share of attention. These factors are previous achievement and perceptions of mastery experience, and results have consistently shown that both variables are related to self-efficacy. Once interpreted, one's past behavior serves as a powerful antecedent of self-efficacy beliefs (Klassen, 2004; Usher & Pajares, 2006). Even when prior achievement scores are included as covariates, the effect of mastery experience on self-efficacy remains significant (Lopez & Lent, 1992). To the degree that students see themselves as successful at academic tasks, they are more likely to believe in their capability to succeed at similar tasks.

Collins (1982) demonstrated that students with similar previous achievement (a behavior factor) and cognitive skills (a personal factor) differed in subsequent achievement as a result of differing self-efficacy perceptions, and she posited that these perceptions mediated between prior attainments and subsequent achievement. She identified children of low, middle, and high mathematics ability who had, within each ability level, either high or low mathematics self-efficacy. After instruction, the children were given problems to solve and could rework those they missed. Ability was related to performance but, regardless of ability level, children with high self-efficacy completed more problems correctly and reworked more of the ones they missed. Even when children possess the requisite subskills to solve problems, those who possess a strong sense of their capabilities are more effective problem solvers.

Self-Efficacy and Environmental Factors

Environmental factors in school contexts include family and teacher support and expectations; peer group and culture; teacher beliefs; classroom structures; feedback; and, of course, social models. The interaction between self-efficacy and environmental events is evident in classrooms. As is the case with the relationship between self-efficacy and behavioral factors, specific studies have focused on unidirectional effects of one variable on the other.

Self-efficacious students create learning environments that are conducive to studying by setting up study routines and eliminating distractions. When environmental problems arise they take steps to overcome them. Students with lower self-efficacy do not exert as much self-regulation, and their behaviors often are easily affected by environmental events (e.g., they talk on the phone to friends who call while they are studying rather than tell their

friends to call back later) (Zimmerman & Paulsen, 1995). Students with strong self-efficacy seize opportunities offered by the social environment, work around institutional obstacles, and alter environmental structures not to their liking, either on their own or collectively. Those not confident in their capabilities, however, are slower to take advantage of opportunities and more likely to lose heart in the face of environmental impediments (Bandura, 1997).

If there is one finding that is incontrovertible in psychology and education it is that young people learn from the actions of models. Watching classmates solve a challenging mathematics problem, for example, can help a student believe that she too can solve it. Schunk and his colleagues have shown that *coping models* – those who struggle through problems until they reach a successful end – are more likely to boost the confidence of observers than are *mastery models* – those who respond to mistakes as though they never make them. Coping models are especially effective for students who have difficulty learning, as competent students may perceive themselves as more similar to mastery models (Schunk, 1987; Schunk & Hanson, 1988). Models can also undermine an observer's confidence, particularly when the model fails at a task perceived as easy. Bandura (1997) noted that students seek out models who are competent at tasks to which they aspire – particularly models with status, power, and prestige. Researchers have suggested that models may play a more influential role during such transitional periods as the shift from elementary to middle school (Eccles, Midgley, & Adler, 1984). Television and other media have increased the salience of "symbolic models," who can convey efficacy-relevant information to young people regarding how to approach school, peers, and parents.

Peers influence children's self-efficacy in various ways. One means is through *model similarity*. Observing similar others succeed can raise observers' self-efficacy and motivate them to perform the task if they believe that they, too, will be successful. Observing others fail can lead students to believe that they lack the competence to succeed and can dissuade them from attempting the task (Schunk, 1987). Model similarity is most influential for students who are uncertain about their performance capabilities, such as those lacking task familiarity and information to use in judging self-efficacy or those who have experienced difficulties and hold doubts (Bandura, 1986; Schunk, 1987; Schunk & Meece, 2006).

Peer influence also operates through *peer networks*, which are large groups of peers with whom students associate. Students in networks tend to be highly similar (Cairns, Cairns, & Neckerman, 1989), which enhances the likelihood of influence by modeling. Networks help define students'

opportunities for interactions and observations of others' interactions, as well as their access to activities (Dweck & Goetz, 1978). Over time network members become more similar to one another. Peer groups promote motivational socialization and influence the self-efficacy of group members.

The messages that students receive from their familial, social, and academic environments also influence the judgments they make about their academic competence. These social persuasions are consistently correlated with self-efficacy, but their independent contribution to the prediction of self-efficacy is less consistent. For example, Klassen (2004) found that Indo Canadian immigrant students reported receiving more information from social persuasions and vicarious influences than did their Anglo Canadian peers, which, he suggested, may indicate that immigrant students experience a more *other-oriented* than *self-oriented* formation of academic confidence. Similarly, Gainor and Lent (1998) found that only mathematics ability, social persuasions, and physiological arousal predicted the self-efficacy beliefs of Black college freshmen. Other researchers have detected mean differences favoring girls on social persuasions and vicarious experiences in mathematics (Lopez, Lent, Brown, & Gore, 1997), writing (Pajares, Johnson, & Usher, 2007), and general academics (Usher & Pajares, 2006). These findings suggest that different subgroups may differently interpret and use self-efficacy information. For instance, some have suggested that children experience a *gender-role intensification* as they progress through adolescence, particularly as regards their achievement-related beliefs (Hill & Lynch, 1983) and that the gendered nature of parents' perceptions of their children's capabilities may actually alter their children's own academic self-perceptions (Frome & Eccles, 1998).

Schunk (1982) demonstrated that effort attributional feedback for prior performance (e.g., "You've been working hard") raises students' self-efficacy, and this increase is, in part, responsible for increased skill in behavioral outcomes such as performance of subtraction problems. In subsequent experiments, he found that ability feedback (e.g., "You're good at this") has an even stronger effect on self-efficacy and subsequent performance (Schunk, 1983; Schunk & Gunn, 1986). Students who have been verbally encouraged to set their own goals experience increases in confidence, competence, and commitment to attain those goals. Self-efficacy also is increased when students are provided with frequent and immediate feedback while working on a task (Schunk, 1983), and, when students are taught to attribute this feedback to their own effort, they work harder, experience stronger motivation, and report greater self-efficacy for further learning (Schunk, 1987).

Results from qualitative analyses give life to Bandura's (1997) claim that when others express faith in one's capabilities, self-efficacy beliefs are more easy to sustain. Such expressions of faith were essential to women who pursued careers in science, mathematics, and technology. The persuasive messages sent to these women bolstered their beliefs in their own capabilities and empowered them to pursue male-dominated careers (Zeldin & Pajares, 2000). Undergraduate students reported receiving similar persuasive boosts to their writing self-efficacy by messages sent them by teachers and parents (Pajares, 1994). Conversely, middle school students who reported low mathematics self-efficacy shared negative comments made by significant others that convinced them that they would never have the skills needed to succeed (Usher, 2007).

Some researchers have observed that African American students' beliefs about themselves and about their schooling have historically profited from the persuasive messages sent to students by members of the African American community – teachers and parents in particular. Walker (2000) noted that, historically, African American schools were driven by many forms of interpersonal and institutional caring that conveyed to students that they were capable to achieve, despite the negative messages those students received in the larger world. In other words, the positive social persuasions operating at a local level may have served to immunize such students against the negative messages they received from the broader culture. Indeed, preliminary evidence suggests that African American students attend more to the social persuasions they receive than do their White counterparts (Usher & Pajares, 2006).

Particularly at the outset of an activity, students differ in their self-efficacy as a function of social supports, a critical environmental factor. These supports include the extent to which significant others such as parents, coaches, and teachers encourage students to learn, provide access to resources necessary for learning such as materials and facilities, and teach them self-regulatory strategies that enhance skill development (see Zimmerman & Cleary, 2006). As students engage tasks and activities, they are also influenced by situational variables such as the feedback they receive and the social comparisons they make. These influences provide students with cues about how well they are learning (Schunk, 1995).

Caprara and his associates have studied the impact of parental influences on the well-being and adjustment of their children. Parents with strong parental self-efficacy believe in their capability to deal effectively with their children. Such parents monitor, support, protect, guide, encourage, and make time for their children, dispense needed discipline with emotional closeness,

and maintain open communication with them so that disagreements do not escalate into open conflict. Parents confident in their parenting skills contribute to their children's development by helping them to cultivate their own potential. They foster the aspirations and capabilities of their children, thereby improving their social relations, emotional well-being, academic development, and career choices. Parents' academic aspirations for their children influence their children's academic achievements both directly and indirectly by influencing children's self-efficacy (see, e.g., Caprara, Regalia, Scabini, Barbaranelli, & Bandura, 2004; Caprara, Scabini, & Sgritta, 2003).

The causal influence of self-efficacy on students' academic achievement-related behaviors as a function of altering environmental determinants has been effectively demonstrated in a series of studies (see Schunk, 1995, for a review). These processes include having students pursue proximal and specific goals, exposing children to social models, providing students with performance and attributional feedback, teaching students learning strategies, having students verbalize strategies while they apply them, linking students' rewards to their learning progress, and having students self-monitor and evaluate their learning progress. These processes differ in many ways but they all help to inform students of their progress in learning. Such information raises their self-efficacy.

Social influences at the institutional level also affect individuals' beliefs about what they can do. For example, social-comparative school practices that emphasize standardized, normative assessments, involve ability grouping and lock-step instruction, use competitive grading practices, and permit students to compare their achievement with that of their peers often work to undermine the self-beliefs of those who are less academically talented or prepared. These are practices that convert "instructional experiences into education in inefficacy" (Bandura, 1997, p. 175). Nichols and Berliner (2007) argued that such structures characterize public schools in the United States today, which are struggling to meet standards of No Child Left Behind (NCLB) policies often at the expense of the psychological well-being and educational opportunities of the students in their care. This is not to say, of course, that students should be artificially shielded from knowing where they stand academically in reference to their peers, particularly if this is done in order to keep self-efficacy strong when students lack critical academic skills. As Bandura (1997) has cautioned, "there are two kinds of self-confidence – one a trait of personality and another that comes from knowledge of a subject. It is no particular credit to the educator to help build the first without building the second. The objective of education is not the production of self-confident fools" (p. 65).

In Bandura's (1986) system of triadic reciprocality, a sense of control over the significant outcomes of one's life is a key motivator of behavior. In fact, it is demoralizing to believe that one has the capabilities to succeed but that environmental barriers (e.g., discrimination, prejudicially structured systems) preclude one from doing so. Self-efficacy is apt to be most influential in predicting behavior when the environment is responsive and allows one to exercise one's capabilities without restraint.

Self-Efficacy and Personal Factors

As we explained earlier, in the social cognitive model of reciprocal causality, self-efficacy is one of the many personal factors with which individuals influence their environments and behaviors. Other personal factors in school contexts include outcome expectations; emotional and physiological indexes; cognition and metacognition; optimism; gender, ethnicity, race, age, and cultural heritage; and academic, social, mental, and verbal ability. Most notably, personal factors also include motivation variables such as self-concept and self-esteem, goals, aspirations, perceived value and interest, locus of control, attributions, sense of autonomy and belongingness, and achievement goal orientations. Exploring the relationship between self-efficacy and other personal factors in human functioning has been a focus of self-efficacy research. As is the case with the relationship between self-efficacy and environmental and behavioral factors, specific studies have focused on unidirectional effects of one variable on the other.

Numerous studies confirm the posited relationship between self-efficacy beliefs and other motivational constructs and academic self-beliefs (see Pajares, 1997). For example, self-efficacy and self-concept are typically highly correlated (Bong & Skaalvik, 2003), but this is to be expected given that self-efficacy is one of the components of self-concept (Marsh & Shavelson, 1985). Self-efficacy typically correlates positively with variables such as perceived value of school and of academic subjects, interest, optimism, holding a mastery goal orientation, and related conceptions of efficacy, such as self-efficacy for self-regulated learning. Conversely, self-efficacy correlates negatively with mathematics anxiety, writing apprehension, and holding a performance-avoid orientation (see Pajares, 1997; Schunk & Pajares, 2005, for reviews). Pajares and Kranzler (1995) tested the joint contribution of self-efficacy and mental ability (the personal factor typically acknowledged as the most powerful predictor of academic outcomes) to mathematics performance and found that self-efficacy beliefs

made a powerful and independent contribution to the prediction of performance.

One of the four hypothesized sources of self-efficacy is a powerful personal factor. Most researchers have reported that people's construal of aversive physiological states such as anxiety and stress are negatively associated with self-efficacy beliefs in mathematics, writing, computer science, and in general academics (Klassen, 2004; Pajares et al., 2007; Usher & Pajares, 2006). As with the other hypothesized sources, the manner in which individuals construe their physiological arousal is of interest in the prediction of self-efficacy. Students who are prone to interpret negative physiological states as indicators of their inadequacies are likely to lower their efficacy judgments than are those who view their arousal as temporary fluctuations that have little to do with their actual capabilities. Some researchers have noted that physiological arousal is curvilinearly related to self-efficacy (Pajares et al., 2007; Usher & Pajares, 2006). Bandura (1997) hypothesized that moderate levels of arousal may be perceived as optimal for boosting one's self-efficacy.

Individuals elicit reactions from the social environment simply by their physical characteristics (Bandura, 2008). These include their gender, race and ethnicity, and age. Research findings on gender differences in self-efficacy typically show that girls hold lower competence beliefs than do boys on tasks perceived as masculine (Meece, 1991). Boys and girls report similar confidence in their mathematics ability during the elementary years, but differences begin to emerge following children's transition to middle or junior high school (Midgley, Feldlaufer, & Eccles, 1989; and see Pajares, 2005, for a review of findings on gender differences in mathematics self-efficacy). By high school, boys are more confident and girls more likely to underestimate their capability (Pajares & Miller, 1994; Pajares & Valiante, 2001). Gifted girls are especially likely to be underconfident about their capabilities (Pajares, 1996).

Gender differences in self-efficacy can arise from the linkage of possessed skills to environmental contexts (Bandura, 1997). Women typically judge self-efficacy for scientific occupations lower than do men, but gender differences disappear when women judge self-efficacy for performing the same skills in everyday activities (Matsui & Tsukamoto, 1991). Women also typically judge self-efficacy lower than men for occupations requiring quantitative skills but differences disappear when self-efficacy judgments for the quantitative activities are made in stereotypically feminine tasks (Junge & Dretzke, 1995). Gender differences can arise as a function of home, cultural, educational, and mass media influences. Developmental research

shows that parents often underestimate their daughters' academic competence and hold lower expectations for daughters (Phillips & Zimmerman, 1990). Parents also act differentially with respect to mathematics and science, often portraying them as male domains (Meece & Courtney, 1992). As girls enter junior and senior high, the perception of mathematics as a masculine domain may further weaken their interest in it.

It is possible that boys and girls show differences in self-efficacy as a result of personal factors unrelated to academic confidence. For example, many gender differences in academic self-beliefs disappear when previous achievement is controlled (Pajares, 1996). Another factor that may be responsible for gender differences is the tendency of boys to be more "self-congratulatory" in their responses and of girls to be more modest (Wigfield, Eccles, & Pintrich, 1996). That is, boys are more likely to express confidence in skills they may not possess and to express overconfidence in skills they do possess. Thus, differences in confidence are masked or accentuated by such response biases.

Yet another personal factor that may be responsible for gender differences in academic self-efficacy deals with the nature of the self-belief that may be undergirding those differences. Researchers have found that some gender differences in social, personality, and academic variables may be a function of *gender orientation* – the stereotypic beliefs about gender that students hold – rather than of gender (see Eisenberg, Martin, & Fabes, 1996). Eccles's (1987) model of educational and occupational choice postulates that cultural milieu factors such as students' gender-role stereotypes are partly responsible for differences in course and career selection and in confidence beliefs and perceived value of tasks and activities. To determine the degree to which gender differences in self-efficacy may be a function of gender stereotypic beliefs rather than of gender, Pajares and Valiante (2001) asked students to report how strongly they identified with characteristics stereotypically associated with males or females in American society. A feminine orientation was associated with writing self-efficacy and rendered non-significant gender differences favoring girls in self-efficacy for self-regulation. These results suggest that some gender differences in academic motivation and in self-regulated learning may in part be accounted for by differences in the beliefs that students hold about their gender rather than by their gender per se.

Environmental factors influence gender differences. In mathematics, for example, differences can arise as a result of the context in which mathematical tasks and activities are placed. Well-intentioned teachers may also hold different expectations for boys and girls. In some cases, elementary

school teachers – most of whom are women – and well-meaning parents may convey to girls that mathematics may be difficult for them. School counselors also may discourage girls from pursuing scientific or technical occupations (Betz & Fitzgerald, 1987).

Social cognitive theory does not endow either gender or gender self-beliefs with agentic and motivating properties (Bussey & Bandura, 1999). Students typically view such areas as mathematics, science, and technology as male domains (Eisenberg et al., 1996). In these areas, a masculine orientation is associated with confidence and achievement because masculine self-perceptions are imbued with the notion that success is a masculine imperative (Eccles, 1987). Language arts is typically associated with a feminine orientation because writing is viewed by most students as a female domain. A feminine orientation is associated with motivational beliefs related to success in writing.

Few studies have been conducted on differences in self-efficacy as a function of race or ethnicity. Some findings show that minority students hold lower competence beliefs than do non-minority students, but researchers often confound ethnicity with social class by comparing middle-class White children with lower-class minority children (Schunk, Pintrich, & Meece, 2008). Graham's (1994) summary of the literature on the motivation of African American students revealed that they "maintain undaunted optimism and positive self-regard even in the face of achievement failure" (p. 103). She found little support for the notion that African Americans have lower competence beliefs than do White students once socioeconomic status is controlled. Similar findings have been reported with Hispanic American students (Stevenson, Hanson, & Uttal, 1990). These findings have resulted primarily from studies of global or domain-specific self-concept. In studies in which task-specific self-efficacy perceptions are assessed, African American students' and Hispanic American students' self-efficacy tends to be lower than that of Whites. Beliefs at differing levels of specificity may perform different functions for minority students.

Competence beliefs such as self-efficacy, as well as academic motivation, decline as students advance in school (Schunk et al., 2008). This decline has been attributed to factors such as greater competition, more norm-referenced grading, less teacher attention to individual student progress, and stresses associated with school transitions. These and other school practices can retard the development of academic efficacy, especially among students who are poorly prepared to cope with ascending academic challenges. Lock-step sequences of instruction frustrate some students who fail to grasp skills and increasingly fall behind their peers (Bandura, 1997).

Ability groupings can hurt self-efficacy among those relegated to lower groups. Classrooms that allow for much social comparison tend to lower self-efficacy for students who find their performances deficient to those of peers (Schunk & Pajares, 2002).

INTERPLAY BETWEEN PERSONAL, ENVIRONMENTAL, AND BEHAVIORAL FACTORS: SUGGESTIONS FOR FUTURE RESEARCH

As we described earlier, the concept of reciprocal determinism in social cognitive theory suggests that personal factors, the environment, and human behavior influence each other bidirectionally. This interplay is both dynamic and temporal in nature. Imagine, for example, a high school student so deeply plagued by personal doubts about his capability to succeed in college that he has no intention of even applying. An environmental event such as the influence of a teacher at a particularly propitious time serves to bolster the student's confidence in academic talents that he indeed possesses. Energized both by his teacher's confidence in him and by newly acquired confidence in himself, he begins to exert the effort and perseverance required to engage in academic behaviors that would have been otherwise unlikely, perhaps even unattempted. He completes his homework with fervor, he makes time to study for exams, and he reduces the number of hours spent at his part-time job. His improved grades further bolster his academic confidence. He applies to college and is accepted. He soon finds himself in a world that he had previously not envisioned.

And, of course, these events need not follow each other in rapid and coherent fashion. Reciprocally influencing factors do not operate simultaneously and thus should be studied over time (Bandura, 1983). The estimates of the strength of any particular influence within the triadic reciprocal model will depend on the time lag used when assessing them (Bandura, 1984). Personal, environmental, and behavioral influences, like seeds, can take time to flower, and in matters of great importance payoffs can be slow. For example, learning to talk, read, and write takes years of skill development and practice. Parents often marvel at their toddler's verbal "explosion," which no doubt was borne out by the combination of physiological development and years of exposure to linguistic stimuli from the environment. Parents and educators have of course come to expect such an explosion around a certain age, and, while waiting, do all they can to

facilitate it. Research has not yet revealed the powerful latent effects of many self-beliefs. No doubt, as Bruner (1996) observed, "we carry with us habits of thought and taste fostered in some nearly forgotten classroom by a certain teacher" (p. 24). Almost absent from the self-efficacy literature are studies that have investigated the ways in which temporal lags influence self-efficacy. This could mean an underestimation of self-efficacy's predictive power. For example, higher education institutions that have implemented diversity programs on campus note that the merits of learning in integrated educational setting do not pay off for some students until they reach the workforce, at which time they report greater confidence in their abilities to interact with people from different cultural backgrounds (Gurin & Nagda, 2006).

Bandura (1983) cautioned that, "to understand fully the interactive relation between behavior and environment, the analysis must be extended temporally and broadened to include cognitive determinants that operate in the triadic system. This requires tapping what people are thinking as they perform responses and experience their effects" (p. 168). As we have seen, few researchers have conducted studies investigating the reciprocality of personal, environmental, and behavioral factors, in great part because such efforts require longitudinal investigations or experimental designs that incorporate variables from each factor as well as an analysis faithful to the complex bidirectional interactions. As a consequence, most researchers have settled for examining the correlational relationship between variables drawn from the three factors, and no effort is made to determine reciprocal causation (though findings are often discussed in terms of causation). Path models that purport to examine causality typically do so with variables that have been assessed at the same time, thus shedding no light on the actual causal influences at work.

There are several ways to test Bandura's (1986) model of reciprocal causation. The simplest is to include variables from two of the factors, something that is typically done in studies of academic motivation, but examine their bidirectional influence. This requires either a longitudinal analysis or a pre-test/post-test experimental design in which bidirectionality is examined by analyzing the influence of a mediator on a variable from one of the factors. A logical improvement is to include variables from each of the factors and examine bidirectionality between two of them. Schunk and his associates conducted a series of studies in which self-efficacy (a personal factor) and academic performance (a behavior factor) were first assessed. This is followed by a treatment (an environmental factor) designed to examine its influence on subsequent self-efficacy and performance. For

example, Schunk (1982) found that certain types of attributional feedback influenced self-efficacy, which, in turn influenced mathematical performance outcomes. Similarly, Collins (1982) examined the bidirectional interplay between previous mathematics performance and instruction as a function of self-efficacy beliefs, finding that self-efficacy mediated the relationship between instruction and subsequent performance.

A fuller test of Bandura's (1986) model would of course assess constructs from each of the factors and examine bidirectional influences between all three. But bear in mind that efforts are complicated in that some constructs are themselves components of other constructs and in that bidirectional influences can exist between the constructs themselves. For example, within the personal factors, self-efficacy beliefs are an essential component of self-concept beliefs (Marsh & Shavelson, 1985). Self-efficacy and other motivation self-beliefs, such as outcome expectations, optimism, and anxiety, for example, influence each other reciprocally. Behavioral determinants such as class participation, classroom conduct, social interactions, and mastery experience are similarly structured and reciprocally determined. Untangling a variable's unique statistical contribution to the prediction of an outcome is a difficult enterprise requiring complex methodological procedures and analyses.

Although a strong test of the model could be accomplished with an elegant and well-bounded quantitative design, qualitative methods are particularly well suited to the task. In one qualitative effort, Zeldin and Pajares (2000) explored the personal stories of women who excelled at careers in areas of mathematics, science, and technology to better understand the ways in which their self-efficacy beliefs and other personal factors, environmental factors such as modeling and persuasions from significant others, and behavioral outcomes such as academic and career choices were codetermined. The women reported that verbal persuasions and vicarious, modeling experiences had nourished their self-efficacy beliefs throughout their education. The beliefs, in turn, had been instrumental as they set out to meet the many challenges required to succeed in male-dominated academic domains. As girls, they developed higher mathematics self-efficacy in homes and classrooms in which parents and teachers stressed the importance and value of mathematical skills, encouraged girls to persist and persevere in the face of academic and social obstacles, and broke down stereotypical conceptions regarding academic domains. In all, the women painted a rich portrait in which personal self-beliefs, environmental events, and academic behaviors interacted throughout their academic journey to succeed in a male-dominated domain.

Qualitative inquiry is also well suited to sifting out the varying heuristics that students use when interpreting environmental and behavioral factors. In one study, middle school students reported relying on modeled information from parents and peers to inform their mathematics self-efficacy (Usher, 2007). Although most students with high self-efficacy reported having at least one parent who was skilled in mathematics, one boy was able to construe his parents' *inaptitude* for math in a way that boosted his confidence and determination to succeed. Such a powerful vicarious experience would likely be lost in a quantitative analysis.

Another challenge to discovering the interplay between the social cognitive determinants lies in the difficulty of establishing causality in human functioning. As regards the influence of environmental factors, for example, Bandura (1978) has rightly observed that "the quest for the ultimate environmental determinant of activities regulated by self-influence becomes a regressive exercise that can yield no victors in explanatory contests, because for every ultimate environmental cause that is invoked, one can find prior actions that helped to produce it" (p. 354). Few would argue that a state's curricular standards and policies, family and community influences, a school's psychological climate, and the learning and social structures in a given teacher's classroom wield considerable influence on a given student's academic self-view. But each of these environmental factors is itself multiply determined by multiple causal antecedents. In these cases, carefully bounded experimental approaches must be conducted to clarify the sources and direction of causation. New methodological approaches hold some promise. For example, hierarchical linear models can examine influences at multiple levels of functioning. In addition, sociocultural and sociostructural approaches are particularly well suited for examining this complex process (e.g., Bronfenbrenner, 1979; Rogoff, 1995).

Caution is also warranted as regards the manner in which variables from environmental and behavioral factors are often operationalized and assessed. In many cases, researchers who purport to measure these factors are actually measuring *personal* determinants instead. Because of the survey nature of most quantitative investigations, behavior outcomes such as effort and persistence are typically assessed using students' self-reports rather than observations. This has also been the case with self-regulatory strategies, which are self-reported by students rather than directly observed by researchers. Two strategies are called for. The first is for researchers to assess both factors through observation; the second is to increase the use of experimental techniques in which constructs can be manipulated. In both

cases, longitudinal research in actual classrooms would be particularly instructive and has been sorely missing.

We have limited our exploration of self-efficacy's role in social cognitive theory's conception of reciprocal determinism to educational contexts. But researchers have demonstrated that this interplay is highly applicable to all work and achievement contexts (see Stajkovic & Luthans, 1998). In addition, we have suggested directions for future self-efficacy research in education, research that maintains a focus on the relational interplay between self-efficacy and the personal, environmental, and behavioral determinants of academic functioning.

We would be remiss if we did not extend two cautions in closing. The first is that, as regards future efforts related to shedding additional light on the relationship between students' academic motivation and achievement, our best sense is that we are nearly past the point of showing that differing personal constructs are either correlated or uncorrelated with academic attainments across varied domains. Studies in which these relations are investigated using correlational methods are becoming redundant. Rather, we are in need of experimental research that sheds further light on the relational interplay between determinants and educational interventions that put into practice the policies, interventions, and schooling strategies that emanate from insights already obtained from, and multiply supported by, research findings. We already know a good deal about the influence of self-efficacy beliefs and of academic motivation. What is lacking is putting that knowledge into greater use by working to alter school and classroom structures, the content of teacher education programs, and educational policy. Motivation research should dedicate itself to these paths with greater vigor.

The second caution deals with the need to place a greater emphasis on ecologically grounded investigations of academic motivation and less on survey-type studies. This would in part require that we give greater value to sound qualitative efforts and less to decontextualized quantitative efforts that serve little function other than to confuse lay readers and practitioners and to provide fodder for psychometricians in search of a problem. Ecologically grounded studies should focus on the cultural dimensions of motivation. We know, for example, that individualism and collectivism powerfully influence the relationship between social and academic self-efficacy beliefs on the one hand and academic achievement and social factors on the other (Oettingen & Zosuls, 2006). Kim and Park (2006) argued that existing psychological and educational theories that emphasize individualistic values (e.g., innate ability, intrinsic interest, self-esteem, even

academic self-efficacy) cannot explain the high level of achievement of East Asian students. Instead, the Confucian-based socialization practices that promote close parent–child relationships are responsible for high levels of self-regulatory, relational, and social efficacy. In these cultures, relational efficacy – the confidence that young people have in their familial and social relations – as well as social support received from parents have a powerful influence on students' academic performance. In addition, the lower levels of self-efficacy beliefs found in some collectivist groups do not always signify lower subsequent performance, but are instead reflective of differing construals of self. Indeed, self-efficacy may be more "other-oriented" in some non-Western cultures, particularly Asian cultures, than in Western cultures (and see Klassen, 2004).

The critical questions in education demand attention to the cultural forces that shape our lives. Personal, environmental, and behavioral determinants of human functioning, cognition, and motivation are always situated in a network of cultural particulars. As the world shrinks and cultural diversity grows, attempting to understand how sociocultural variations influence academic motivation seems more critical than ever. Culturally attentive views of motivational processes can help us clarify how personal, environmental, and behavioral factors are created, interact, and develop as a result of differing cultural practices or differing group membership, as well as how these practices influence students' school success and enrich their lives.

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