Perceived Self-Efficacy in Cognitive Development and Functioning

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In this article, I review the diverse ways in which perceived self-efficacy contributes to cognitive development and functioning. Perceived self-efficacy exerts its influence through four major processes. They include cognitive, motivational, affective, and selection processes. There are three different levels at which perceived self-efficacy operates as an important contributor to academic development. Students' beliefs in their efficacy to regulate their own learning and to master academic activities determine their aspirations, level of motivation, and academic accomplishments. Teachers' beliefs in their personal efficacy to motivate and promote learning affect the types of learning environments they create and the level of academic progress their students achieve. Faculties' beliefs in their collective instructional efficacy contribute significantly to their schools' level of academic achievement. Student body characteristics influence school-level achievement more strongly by altering faculties' beliefs in their collective efficacy than through direct affects on school achievement.

The attention of our discipline has centered heavily on how the mind works in processing, organizing, and retrieving information. The mind as a computational program became the conceptual model for the times. Research on how people process information has clarified many aspects of cognitive functioning. However, this austere cognitivism has neglected self-regulatory processes that govern human development and adaption. Effective intellectual functioning requires much more than simply understanding the factual knowledge and reasoning operations for given activities. The self-regulatory social, motivational, and affective contributors to

cognitive functioning are best addressed within the conceptual framework of the exercise of human agency.

The recent years have witnessed a resurgence of interest in the self processes by which human agency is exercised (A. Bandura, 1986). There are several reasons why self-referent phenomena have come to pervade diverse areas of psychology. Self influences affect the selection and construction of environments. The impact of most environmental influences on human motivation, affect, and action is heavily mediated through self processes. They give meaning and valence to external events. Self influences thus operate as important proximal determinants at the very heart of causal processes.

People make causal contributions to their own functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives. Efficacy beliefs influence how people feel, think, motivate themselves, and behave. Self-efficacy beliefs produce these diverse effects through four major processes (A. Bandura, 1992). They include cognitive, motivational, affective, and selection processes. Each of these processes is analyzed in the sections that follow.

COGNITIVE PROCESSES

The effects of self-efficacy beliefs on cognitive processes take a variety of forms. Much human behavior, which is purposive, is regulated by forethought embodying cognized goals. Personal goal setting is influenced by self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them (A. Bandura, 1991).

Most courses of action are initially shaped in thought. People's beliefs in their efficacy influence the types of anticipatory scenarios they construct and rehearse. Those who have a high sense of efficacy visualize success scenarios that provide positive guides and supports for performance. Those who doubt their efficacy visualize failure scenarios and dwell on the many things that can go wrong. It is difficult to achieve much while fighting self-doubt.

The conception of human ability has undergone considerable change in recent years. Ability is not a fixed attribute residing in one's behavioral repertoire. Rather, it is a generative capability in which cognitive, social, motivational, and behavioral skills must be organized and effectively orchestrated to serve numerous purposes. It also involves skill in managing aversive emotional reactions that can impair the quality of thinking and

action. There is a marked difference between possessing knowledge and skills and being able to use them well under taxing conditions. Personal accomplishments require not only skills but self-beliefs of efficacy to use them well. Hence, a person with the same knowledge and skills may perform poorly, adequately, or extraordinarily depending on fluctuations in self-efficacy thinking.

The self-efficacy contribution to skill utilization is illustrated in a study by Collins (1982). She selected children at three levels of mathematical ability—low, medium, and high. Within each of these ability levels, she found children who were assured in their perceived mathematical self-efficacy and others who had self-doubts. They were given difficult problems to solve. At each level of ability, children who believed strongly in their capabilities were quicker to discard faulty strategies. They performed better (Figure 1). They chose to rework more of the problems they failed and did so more accurately than did children of equal ability who were plagued by self-doubts. Positive attitudes toward mathematics were better predicted by perceived self-efficacy than by actual ability. As this study shows, people who perform poorly may do so because they lack the skills or they have the skills but they lack the sense of efficacy to use them well. Bouffard-Bouchard (1989) and Bouffard-Bouchard, Parent, and Larivée (1991) not only corroborated the independent contribution of perceived self-efficacy to cognitive performance but identified self-regulative processes through which it does so.
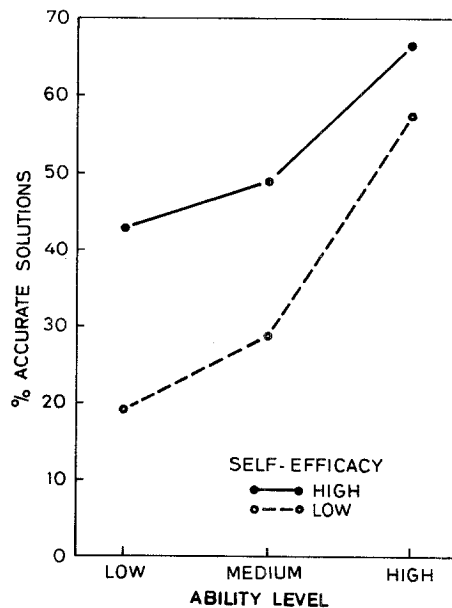

FIGURE 1   Mean levels of mathematical solutions achieved by students as a function of mathematical ability and perceived mathematical self-efficacy. Plotted from Collins's (1982) data. From "Perceived Self-Efficacy in the Exercise of Personal Agency" by A. Bandura, 1989, *The Psychologist: Bulletin of the British Psychological Society,* 2, p. 412. Copyright 1989 by the British Psychological Society. Reprinted by permission.

A major function of thought is to enable people to predict events and to develop ways to control those events that affect their lives. Such skills require effective cognitive processing of information that contains many ambiguities and uncertainties. In learning predictive and regulative rules, people must draw on their knowledge to construct options, to weight and integrate predictive factors, to test and revise their judgments against the immediate and distal results of their actions, and to remember which factors they had tested and how well they had worked. It requires a strong sense of efficacy to remain task oriented in the face of pressing situational demands and failures that have social repercussions.

The powerful influence of self-efficacy beliefs on cognitive processes is revealed in a program of research on complex learning and decision making (Wood & A. Bandura, 1989b). Individuals manage a computer-simulated organization in which they have to match individuals to subfunctions based on their interests and talents. They also have to learn and implement instructive and motivational strategies for enhancing the performance of their group. This is not unlike what teachers and principals have to do. At the outset, organizational properties are systematically varied, and belief systems are instilled that can enhance or undermine the managers' beliefs in their capabilities. The managers make the complex sets of decisions on repeated occasions in efforts to fulfill different task demands. At periodic intervals, their perceived self-efficacy, organizational aspirations, and quality of analytic thinking are assessed. The level of organizational performance they achieve is also measured.

Conception of Ability

One belief system that affects cognitive functioning is concerned with how people construe ability (M. M. Bandura & Dweck, 1988; Dweck & Leggett, 1988; Nicholls, 1984). Some children regard ability as an acquirable skill that can be increased by gaining knowledge and competencies. Such children adopt a functional-learning goal. They seek challenges that provide opportunities to expand their knowledge and competencies. They regard errors as a natural part of an acquisition process. One learns from mistakes. Therefore, they are not easily rattled by difficulties. They judge their capabilities more in terms of personal improvement than by comparison against the achievement of others.

Other children view ability as an inherent capacity. For them, performance is diagnostic of their inherent intellectual capacities. Deficient performances carry high evaluative threats that they lack basic intelligence. Therefore, they prefer tasks that minimize errors and reveal their proficiency at the expense of expanding their knowledge and competencies. Having to exert high effort is also threatening because it presumably reveals

one is not smart. The successes of others belittle their own perceived ability. The inherent capacity view fosters a self-diagnostic focus aimed at protecting a positive evaluation of one's competence. The acquirable skill view fosters a task-diagnostic focus aimed at expanding one's competence and mastering challenges.

We (Wood & A. Bandura, 1989a) tested the notion that conceptions of ability affect thought processes and performance attainments through the self-efficacy mechanism. Before the individuals began, we instilled the different conceptions of ability by telling some of them that proficient management of the simulated organization reflected inherent intellectual capacity. Others were told that performance on this managerial task reflected an acquirable intellectual skill. Then we measured how these two conceptions of ability affected the self-regulatory factors governing performance attainments (Figure 2).

For those who viewed ability as reflecting an inherent intellectual aptitude, their perceived efficacy plummeted as they encountered problems, they became more and more erratic in their analytic thinking, and they lowered their aspirations for the group. The group they managed showed a progressive deterioration in performance. In contrast, conception of ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Under this belief system, the individuals remained steadfast in their perceived efficacy, despite difficult standards to fulfill, they continued to set challenging goals for the group, and they used analytic strategies in efficient ways. Such a self-efficacious orientation paid off in high group attainments.

Human functioning is also affected by the beliefs people hold about how ability changes over time. Those who regard ability as a biologically shrinking capacity with increasing age are quick to read faulty performances as indicants of declining capacity. They do little to exploit their capabilities. Those who view ability as a skill that must be developed and practiced achieve higher attainments. Berry (1987) found that the more older adults believe in their memory capabilities, the more time they devote to cognitive processing of memory tasks. Higher cognitive effort, in turn, produces better memory performance (Figure 3). Perceived cognitive self-efficacy affects memory performance both directly and indirectly by raising cognitive effort.

Social Comparison Influences

Most activities do not provide objective standards for assessing ability. People must, therefore, assess their capabilities in relation to the attainments of others. The people with whom individuals compare themselves influence how they judge their ability. Social comparative standards also
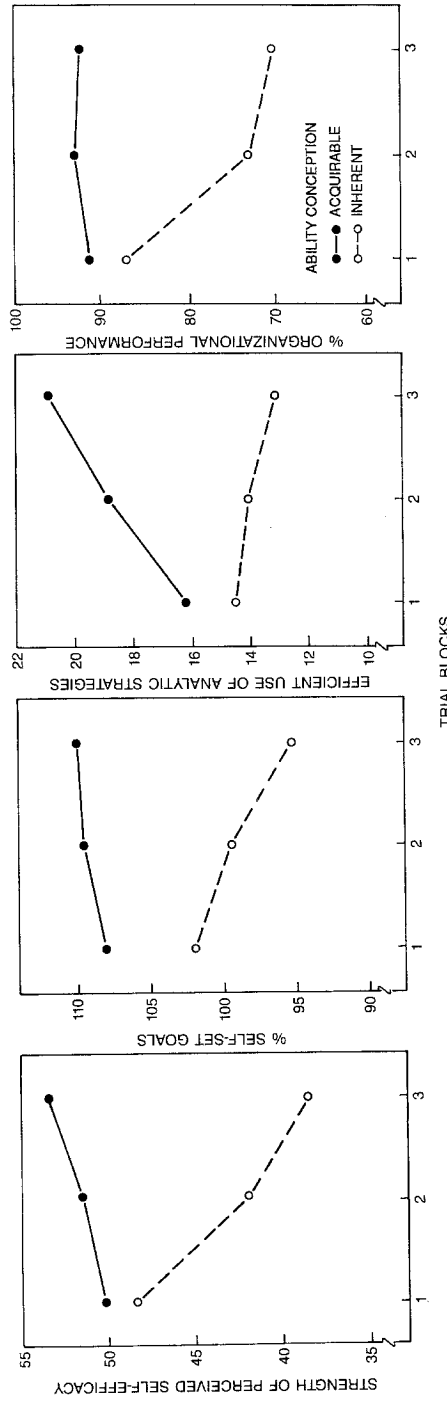
FIGURE 2 Changes in perceived managerial self-efficacy, the performance goals set for the organization relative to the preset standard, effective use of analytic strategies, and achieved level of organizational performance across blocks of production trials under conceptions of ability as an acquirable skill or as an inherent intellectual aptitude. Each trial block comprises six different production orders (Wood & A. Bandura, 1989a). From "Impact of Conceptions of Ability on Self-Regulatory Mechanisms and Complex Decision Making" by R. Wood and A. Bandura, 1989a, *Journal of Personality and Social Psychology*, 56, p. 412. Copyright 1989 by the American Psychological Association. Reprinted by permission.
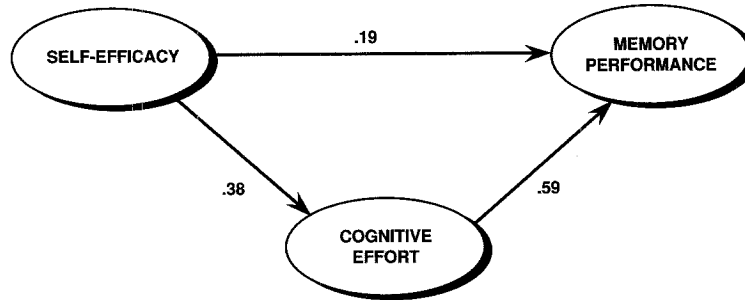
FIGURE 3   Path analysis showing that perceived self-efficacy enhances memory performance directly and by increasing cognitive processing of information. Plotted from Berry's (1987) data.

affect their self-esteem and how much satisfaction they derive from their accomplishments. In their academic work, students receive a great deal of comparative information about their capabilities from grading practices and teachers' evaluations of their scholastic performances (Marshall & Wienstein, 1984; Rosenholtz & Simpson, 1984). These unremitting comparative evaluations carry strong efficacy implications.

Our organizational research confirms that social comparison affects performance through its impact on self-regulatory mechanisms (A. Bandura & Jourden, 1991). Individuals received accurate feedback about how well their group performed and preset information on how well others managed their groups. In one condition, the comparative information showed the manager performing poorer than the comparison group at the outset, then gradually closing the gap and eventually surpassing the comparators. In a second condition, the comparative information showed the manager doing as well as the comparison group at the outset, then falling behind and ending well below the comparators.

Seeing oneself surpassed by others undermined personal efficacy, increased erratic analytic thinking, and progressively impaired performance attainments (Figure 4). By contrast, seeing oneself gain progressive mastery strengthened personal efficacy, fostered efficient thinking, and enhanced performance attainments.

Framing of Feedback

In their various pursuits, people strive for certain goals or levels of competence and receive social feedback from time to time concerning their performances. These desired accomplishments are reached gradually rather than fulfilled quickly. The way in which their progress is socially evaluated can strongly affect their self-efficacy appraisal and thereby alter the course
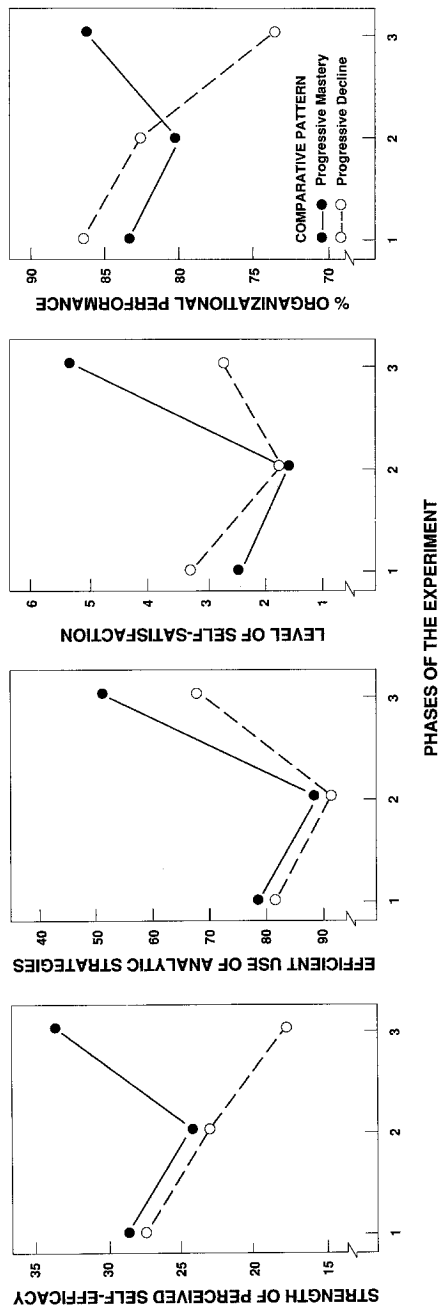
FIGURE 4 Changes in perceived managerial self-efficacy, quality of analytic thinking, and achieved level of organizational performance across blocks of production tasks under comparative appraisal, suggesting progressive mastery or progressive decline relative to a similar comparison group of managers (A. Bandura & Jourden, 1991). From "Self-Regulatory Mechanisms Governing the Impact of Social Comparison on Complex Decision Making" by A. Bandura and F. J. Jourden, 1991, *Journal of Personality and Social Psychology, 60,* p. 946. Copyright 1991 by the American Psychological Association. Reprinted by permission.

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of their attainments. Performance feedback that focuses on achieved progress underscores personal capabilities. Feedback that focuses on short-falls highlights personal deficiencies.

Jourden (1992) examined management of the simulated organization in which the feedback to different individuals was factually equivalent but varied in whether progress or shortfalls were emphasized. For example, if an individual performed at a 75% level of a standard, the positive social feedback highlighted the 75% progress already achieved. The negative feedback highlighted the 25% shortfall. As shown in Figure 5, accenting the gains achieved enhances perceived self-efficacy, aspirations, efficient ana-lytic thinking, self-satisfaction, and performance accomplishments. High-lighting deficiencies undermines self-regulative influences with resulting deterioration of performance.

Learning environments that construe ability as an acquirable skill, deemphasize competitive social comparison, and highlight self-comparison of progress and personal accomplishments are well suited for building a sense of efficacy that promotes academic achievement.

Perceived Controllability

Another important belief system concerns people's views about the extent to which their environment is controllable. There are two aspects to the exercise of control. The first concerns the level and strength of personal efficacy to produce changes by perseverant effort and creative use of capabilities and resources. The second aspect concerns the modifiability of the environment. This facet represents the constraints and opportunities provided by the environment to exercise personal efficacy. People who are plagued by self-doubts anticipate the futility of efforts to modify their life situation. They produce little change even in environments that provide many potential opportunities. But those who have a firm belief in their efficacy, through ingenuity and perseverance, figure out ways of exercising some control, even in environments containing limited opportunities and many constraints.

Our (A. Bandura & Wood, 1989) research underscores the power of perceived controllability of the environment on the self-regulatory factors that govern cognitive functioning. One group of individuals managed our simulated organization with an instilled view that group behavior is not easily influenceable. They quickly lost faith in their capabilities, even when performance standards were within easy reach. They lowered their aspira-tions, and their group's performance deteriorated (Figure 6).

Other individuals operated with the view that group behavior is amenable to influence. They exhibited a highly resilient self-efficacy, even in the face of numerous difficulties; set themselves increasingly challenging goals; and
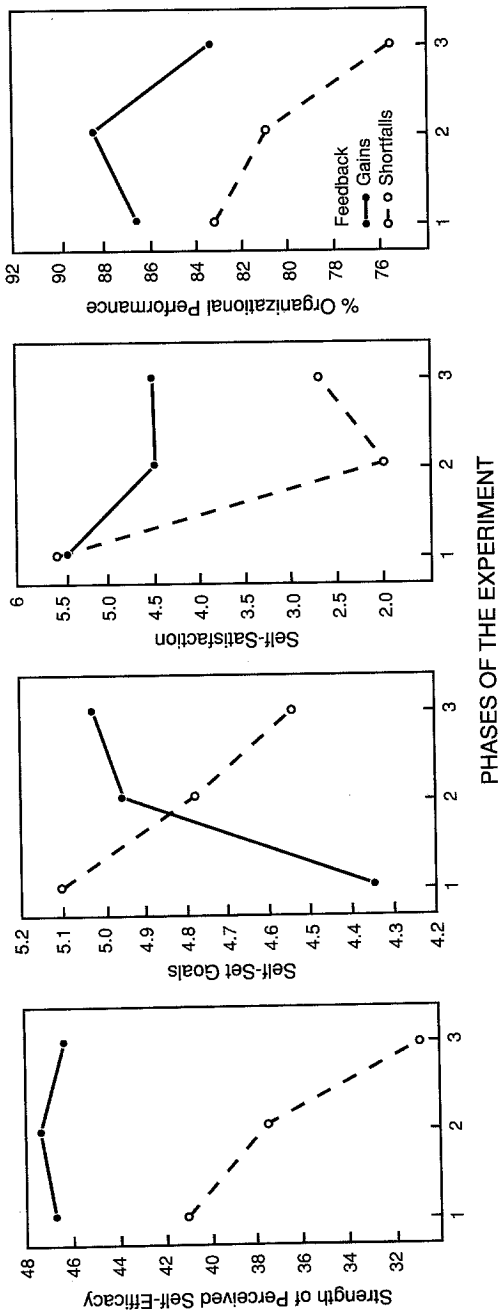
FIGURE 5 Changes in self-regulatory factors and performance attainments depending on whether performance feedback is given as level of progress toward a selected standard (Mastery) or as shortfalls from the standards (Deficit). Plotted from Jourden's (1992) data.
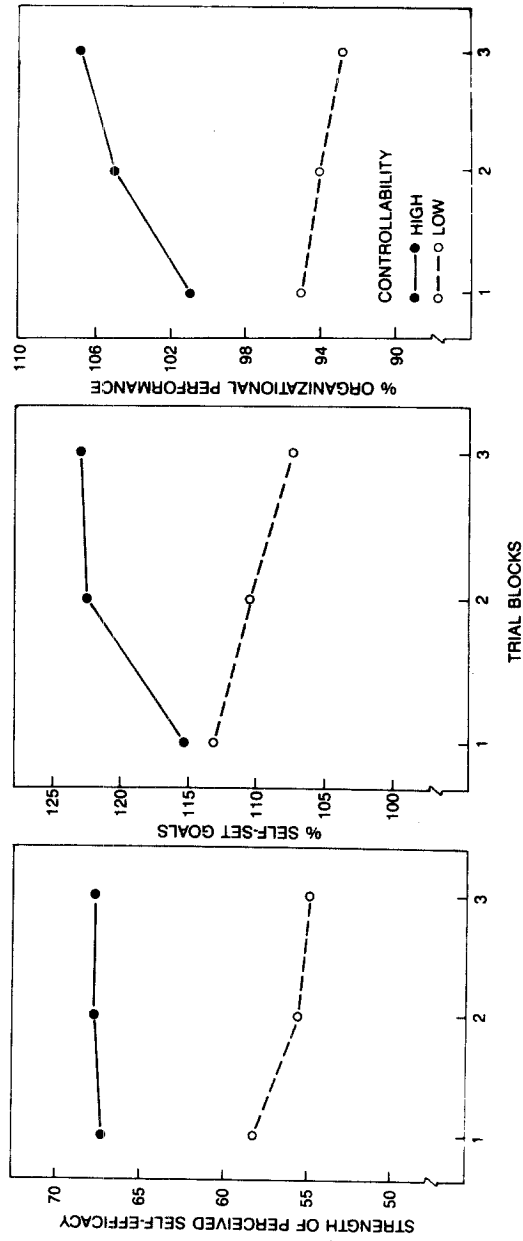
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FIGURE 6 Changes in strength of perceived managerial self-efficacy, the performance goals set for the organization, and level of organizational performance for managers who operated under a cognitive set that organizations are controllable or difficult to control. Each trial block comprises six different production tasks (A. Bandura & Wood, 1989). From "Effect of Perceived Controllability and Performance Standards on Self-Regulation of Complex Decision-Making" by A. Bandura and R. Wood, 1989, *Journal of Personality and Social Psychology, 56,* p. 809. Copyright 1989 by the American Psychological Association. Reprinted by permission.

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used good analytic thinking. They achieved a high level of group performance.

Casual Structure

Figure 7 summarizes the path analysis of the casual structure in the series of experiments just described. Initially, people relied heavily on their past performance in judging their efficacy and setting their aspirations. But as they began to form a self-schema concerning their efficacy through further experience, their performance attainments were powered more strongly and intricately by their belief in their personal efficacy. Perceived self-efficacy influences performance both directly and through its strong effects on goal setting and analytic thinking. Personal goals, in turn, enhance performance attainments through analytic strategies.

MOTIVATIONAL PROCESSES

Self-beliefs of efficacy play a key role in the self-regulation of motivation (A. Bandura, 1991). Most human motivation is cognitively generated. People motivate themselves and guide their actions anticipatorily by the exercise of forethought. They form beliefs about what they can do. They anticipate likely outcomes of prospective actions. They set goals for themselves and plan courses of action designed to realize valued futures. Forethought is translated into incentives and appropriate action through self-regulatory mechanisms.

One can distinguish three different forms of cognitive motivators around which different theories have been built. These include *casual attributions*, *outcome expectancies*, and *cognized goals*.The corresponding theories are attribution theory, expectancy–value theory, and goal theory, respectively. Figure 8 summarizes schematically these alternative conceptions of cognitive motivation. Self-efficacy beliefs operate in each of these various forms of cognitive motivation. They influence casual attributions. People who regard themselves as highly efficacious ascribe their failures to insufficient effort; those who regard themselves as inefficacious attribute their failures to low ability (Alden, 1986; Collins, 1982; McAuley, Duncan, & McElroy, 1989; Silver, Mitchell, & Gist, 1989). Casual attributions affect motivation, performance, and affective reactions mainly through beliefs of self-efficacy (Chwalisz, Altmaier, & Russell, 1992; McAuley, 1991; Schunk & Gunn, 1986; Schunk & Rice, 1986).

In expectancy–value theory, motivation is governed by the expectation that behavior will produce certain outcomes and the value of those outcomes. But people act on their beliefs about what they can do, as well as
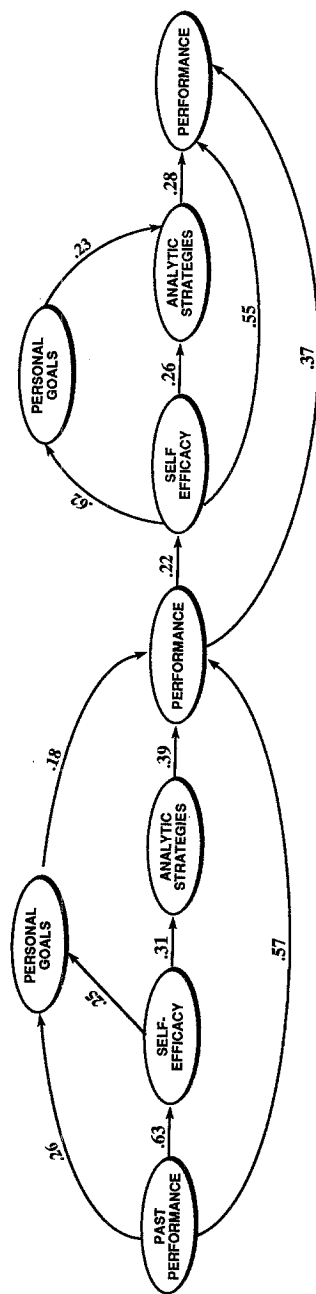
FIGURE 7   Path analysis of causal structures. The numbers on the paths of influence are the standardized path coefficients significant at the .05 level. The network of relations on the left side of the figure are for the initial managerial efforts, and those on the right side are for later managerial efforts (Wood & Bandura, 1989b). From "Social Cognitive Theory of Organizational Management" by R. Wood and A. Bandura, 1989b, *Academy of Management Review, 14*, p. 379. Copyright 1989 by the Academy of Management. Reprinted by permission.

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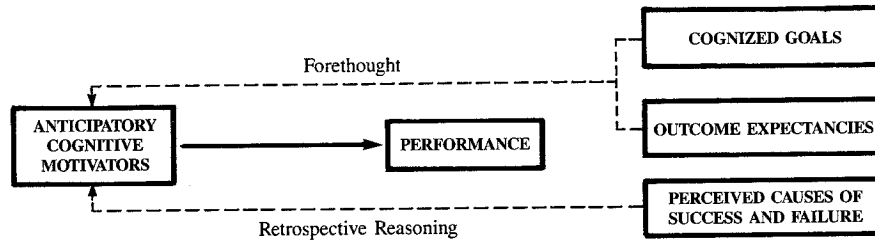
FIGURE 8   Schematic representation of conceptions of cognitive motivation based on cognized goals, outcome expectancies, and causal attributions. From "Perceived Self-Efficacy in the Exercise of Personal Agency" by A. Bandura, 1989, *The Psychologist: Bulletin of the British Psychological Society*, 2, p. 416. Copyright 1989 by the British Psychological Society. Reprinted by permission.

their beliefs about the likely outcomes of performance. The motivating potential of outcome expectancies is thus partly governed by self-beliefs of capability. There are countless attractive options people do not pursue because they judge they lack the capabilities for them. The predictiveness of expectancy–value theory is enhanced by including the self-efficacy determinant (de Vries, Dijkstra, & Kuhlman, 1988; Dzewaltowski, Noble, & Shaw, 1990; Madden, Ellen, & Ajzen, 1992; McCaul, O'Neill, & Glasgow, 1988; Wheeler, 1983).

Cognized Goals

The capacity to exercise self-influence by personal challenge and evaluative reaction to one's own attainments provides a major cognitive mechanism of motivation. Behavior is motivated and guided by cognized goals operating in the present rather than pulled by an unrealized future state. A large body of evidence shows that explicit, challenging goals enhance and sustain motivation (Locke & Latham, 1990). Goals operate largely through self-influence processes rather than regulate motivation and action directly. Motivation based on goal setting involves a cognitive comparison process. By making self-satisfaction conditional on matching adopted goals, people give direction to their behavior and create incentives to persist in their efforts until they fulfill their goals. They seek self-satisfaction from fulfilling valued goals and are prompted to intensify their efforts by discontent with substandard performances.

Self-Reactive Influences

Motivation based on goals or standards is governed by three types of self influences. They include affective reactions to one's performance, perceived

self-efficacy for goal attainment, and readjustment of personal goals based on one's progress. Self-efficacy beliefs contribute to motivation in several ways: They determine the goals people set for themselves, how much effort they expend, how long they persevere in the face of difficulties, and their resilience to failures. When faced with obstacles and failures, people who harbor self-doubts about their capabilities slacken their efforts or give up quickly. Those who have a strong belief in their capabilities exert greater effort when they fail to master the challenge. Strong perseverance usually pays off in performance accomplishments.

The contribution of these three self influences to motivation is shown in a study (A. Bandura & Cervone, 1986) in which the direction and magnitude of discrepancy between performance and a difficult assigned goal were varied. The more sources of self influence individuals brought to bear on themselves, the higher the effort they exerted to attain their goals (Figure 9). Taken together, this set of self influences accounts for the major share of variation in motivation.

Schunk's (1984) studies of children's academic learning through self-regulated instruction reveal that perceived self-efficacy contributes to development of cognitive skills by two paths of influence (Figure 10). It does so directly and by sustaining perseverant effort in the face of difficulties.

Proactive Control of Motivation

Most theories of motivation and self-regulation are founded on a negative feedback system. In this view, discrepancy between one's perceived performance and an adopted standard motivates action to reduce the disparity. This is the basic motivator in control theory, homeostatic drive theories, and cybernetic models. Reduction of discrepancy between internal schemata and perceived events is also the sole motivating mechanism in Piaget's (1960) theory.

Motivation by negative discrepancy tells only half the story, and by no

FIGURE 9   Mean percentage of change in motivational level as a function of the number of self-reactive influences operating in given individuals. The three self-reactive factors include strong perceived self-efficacy for goal attainment; self-dissatisfaction with substandard performance; and adoption of challenging standards. Plotted from A. Bandura and Cervone's (1986) data.
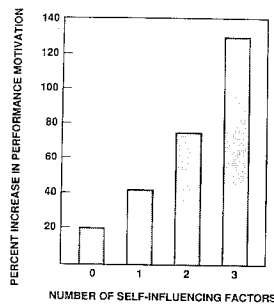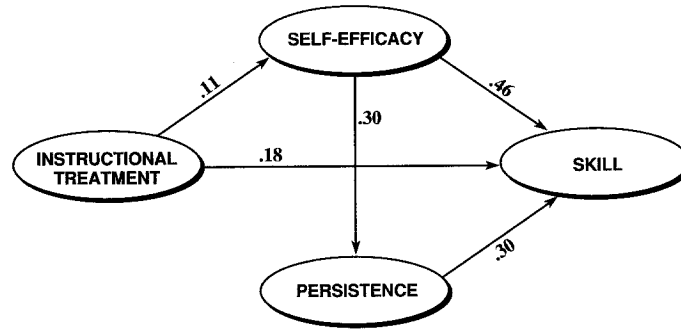
FIGURE 10   Path analysis showing the mediating role of perceived mathematical self-efficacy in the mastery of mathematical competencies (Schunk, 1984). From "Self-Efficacy Perspective on Achievement Behavior" by D. H. Schunk, 1984, *Educational Psychologist, 19*, p. 51. Copyright 1984 by the American Psychological Association. Reprinted by permission.

means is it the more interesting half. In fact, people are proactive, aspiring organisms. Human motivation relies on discrepancy production as well as discrepancy reduction. It requires proactive control as well as reactive feedback control. People motivate and guide their actions through proactive control by setting themselves challenging goals that create a state of disequilibrium. Then they mobilize their skills and effort to accomplish what they seek. After people attain the goal they have been pursuing, those with a strong sense of efficacy set higher goals for themselves. Adopting further challenges creates new motivating discrepancies to be mastered. Self-motivation, thus, involves a dual control process of motivating discrepancy production followed by discrepancy reduction.

AFFECTIVE PROCESSES

People's beliefs in their capabilities affect how much stress and depression they experience in threatening or difficult situations, as well as their level of motivation (A. Bandura, in press). This is the emotional mediator of self-efficacy belief. Perceived efficacy to exercise control over stressors plays a central role in anxiety arousal. People who believe they can exercise control over threats do not conjure up disturbing thought patterns. But those who believe they cannot manage threats experience high anxiety arousal. They dwell on their coping deficiencies. They view many aspects of their environment as fraught with danger. They magnify the severity of possible threats and worry about things that rarely happen. Through such

inefficacious thinking, they distress themselves and impair their level of functioning.

When people try to cope with threats for which they distrust their efficacy, their stress mounts, their heart rate accelerates, their blood pressure rises, they activate stress-related hormones, and they suffer a decline in immune function (A. Bandura, 1988b). After their coping efficacy is strengthened to the maximal level by guided mastery experiences, they handle the same tough situations without being burdened with stress reactions.

Perceived coping self-efficacy regulates avoidance behavior as well as anxiety arousal. The stronger the instilled sense of coping self-efficacy, the bolder people are in taking on taxing and threatening activities (A. Bandura, 1988a). The role of perceived coping efficacy and anxiety in the causal structure of avoidant behavior has been examined in numerous studies. The results show that people base their actions in threatening situations on their coping efficacy rather than on anxiety arousal. Perceived coping efficacy predicts behavior when anticipated anxiety is partialed out. But anticipated anxiety does not predict avoidant behavior when perceived coping self-efficacy is partialed out (Williams, 1992).

Thought Control Efficacy

Stress is affected not only by perceived coping efficacy but by perceived efficacy to control disturbing thoughts. The exercise of control over one's own consciousness is summed up well in the proverb: "You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your head." Perceived self-efficacy to control thought processes is a key factor in regulating thought produced stress and depression. It is not the sheer frequency of disturbing thoughts but the perceived inability to turn them off that is the major source of distress (Kent & Gibbons, 1987). Both perceived coping self-efficacy and thought control efficacy operate jointly to reduce anxiety and avoidant behavior (Ozer & A. Bandura, 1990).

Coping Efficacy and Achievement Anxiety

Students who have a low sense of efficacy to manage academic demands are especially vulnerable to achievement anxiety. As Meece, Wigfield, and Eccles (1990) showed, past academic successes and failures arouse anxiety through their effects on perceived self-efficacy. If failures weaken students' sense of efficacy, they become anxious about scholastic demands. But if their perceived efficacy is unshaken by failures, they remain unperturbed. Student's beliefs in their capabilities to master academic subjects predict

their subsequent academic attainments. Their level of scholastic anxiety bears little or no relationship to their academic performances.

These findings carry important implications for how to alleviate scholastic anxiety. It is best reduced not by anxiety palliatives but by building a strong sense of efficacy. This is achieved through development of cognitive capabilities and self-regulative skills for managing academic task demands and self-debilitating thought patterns.

Many teachers find themselves beleaguered day in and day out by disruptive and nonachieving students. Eventually, their low sense of efficacy to fulfill academic demands takes a stressful toll. Teachers who lack a secure sense of instructional efficacy show weak commitment to teaching and spend less time on academic matters. Burnout in academe is not all that uncommon. This graphic metaphor encompasses a syndrome of reactions to chronic occupational stressors that include physical and emotional exhaustion, depersonalization of the people with whom one is working, and feelings of futility concerning personal accomplishments. Chwalisz et al. (1992) provides evidence that teachers with high perceived coping efficacy manage academic stressors by directing their efforts at resolving problems. In contrast, teachers who distrust their efficacy try to avoid dealing with academic problems and, instead, turn their effort inward to relieve their emotional distress. This pattern of withdrawal coping contributes to occupational burnout.

Self-Efficacy and Depression

A low sense of efficacy to exercise control produces depression as well as anxiety. It does so in at least three different ways (A. Bandura, in press). One route to depression is through unfulfilled aspiration. People who impose standards of self-worth they cannot attain drive themselves to bouts of depression. A second efficacy route to depression is through a low sense of social efficacy. People who judge themselves to be socially efficacious seek out and cultivate social relationships that provide models on how to manage difficult situations, cushion the adverse effects of chronic stressors, and bring satisfaction to people's lives. Perceived self-efficacy both fosters enlistment of social support and mediates its beneficial effects on psychological well-being and functioning. Much human depression is cognitively generated by dejecting ruminative thought. A low sense of efficacy to exercise control over ruminative thought also contributes to the occurrence, duration, and recurrence of depressive episodes (Kavanagh & Wilson, 1989).

SELECTION PROCESSES

The discussion so far has centered on efficacy-activated processes that enable people to create beneficial environments and to exercise some

control over them. People are partly the product of their environment. Therefore, beliefs of personal efficacy can shape the course lives take by influencing choice of activities and environments. People avoid activities and situations they believe exceed their coping capabilities. But they readily undertake challenging activities and select situations they judge themselves capable of handling. By the choices they make, people cultivate different competencies, interests, and social networks that determine life courses. Any factor that influences choice behavior can profoundly affect the direction of personal development. This is because the social influences operating in selected environments continue to promote certain competencies, values, and interests long after the self-efficacy determination of their choice has rendered its inaugurating effect.

Career choice and development is but one example of the power of self-efficacy beliefs to affect the course of life paths through choice-related processes (Betz & Hackett, 1986; Lent & Hackett, 1987). The stronger people's belief in their efficacy, the more career options they consider possible, the greater the interest they show in them, the better they prepare themselves educationally for different occupations, and the greater their staying power and success in difficult occupational pursuits.

The efficacy-regulated processes reviewed in the preceding sections play a key role in setting the course of intellectual development. They also influence how well preexisting cognitive skills are used in managing the demands of everyday life. There are three principal ways in which perceived efficacy operates as an important contributor to academic development: students' beliefs in their efficacy to regulate their own learning and to master different subject matters, individual teachers' beliefs in their efficacy to motivate and promote learning in their students and staffs' collective sense of efficacy that their schools can accomplish significant academic progress. The influence of these different efficacy belief systems are addressed next.

STUDENTS' COGNITIVE SELF-EFFICACY

Let us first consider students' beliefs in their intellectual and learning efficacy. Schunk (1989) conducted numerous studies in which children who have serious academic deficits pursue self-directed learning of mathematical and language skills. The material is structured for them in easily mastered subskills. The self-directed learning is supplemented with instructional social influences designed to enhance children's sense of academic efficacy. These influences include verbal modeling of cognitive strategies, proximal goal setting, ability and effort attributional feedback, positive incentives, and self-verbalization of task strategies.

The findings show that such instructional programs and the supplemen-

tary social factors build children's beliefs in their intellectual capabilities. The higher their perceived efficacy, the better they perfect their cognitive capabilities. Self-efficacy is influenced by acquisition of skills, but it is not merely a reflection of them. Children with the same level of cognitive skill development differ in their intellectual performance depending on the strength of their perceived self-efficacy.

Self-Efficacy in Self-Regulated Cognitive Development

A major goal of formal education should be to equip students with the intellectual tools, self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime. These personal resources enable individuals to gain new knowledge and to cultivate skills either for their own sake or to better their lives. The rapid pace of technological change and accelerated growth of knowledge are placing a premium on capability for self-directed learning.

Metacognitive theorists have addressed the pragmatics of self-regulation in terms of selecting appropriate strategies, testing one's comprehension and state of knowledge, correcting one's deficiencies, and realizing the utility of cognitive strategies. Metacognitive training aids academic learning. However, students do not necessarily transfer the skills spontaneously to dissimilar pursuits. They do not always use the metacognitive skills with regularity. Clearly, there is room for improvement. It is commonly acknowledged that self-directed learning requires motivation as well as cognitive and metacognitive strategies. The motivational facet of self-directed learning encompasses a variety of interlinked self-referent processes including self-monitoring, self-efficacy appraisal, personal goal setting, outcome expectations, and affective self incentives (A. Bandura, 1986, 1991).

Zimmerman (1990) has been the leading exponent of an expanded model of academic self-regulation. In social cognitive theory, people must develop skills in regulating the motivational, affective, and social determinants of their intellectual functioning as well as the cognitive aspects. Zimmerman and Martinez-Pons (1986) showed that good self-regulators do better academically than poor self-regulators.

Self-regulatory skills will not contribute much if students cannot get themselves to apply them persistently in the face of difficulties, stressors, and competing attractions. Firm belief in one's self-regulatory skills provides the staying power. This is confirmed in a recently completed study (Zimmerman, A. Bandura, & Martinez-Pons, 1992). High school students, mainly of minority status, were tested for the perceived self-efficacy to structure environments conducive to learning, to plan and organize their academic activities, to use cognitive strategies to enhance understanding, to

obtain information and get teachers and peers to help them when needed, to motivate themselves to do their school work, to get themselves to complete scholastic assignments within deadlines, and to stick to academic activities when there are more interesting things to do. The higher the students self-regulatory efficacy, the more assured they were in their efficacy to master academic subjects (Figure 11). Perceived efficacy promoted academic achievement both directly and by raising personal goals. The parents aspirations influenced academic achievement only indirectly through their effects on their children's personal goals. It is not enough for parents simply to set academic standards for their children. Unless parents also build their children's sense of efficacy, they are likely to view high standards as beyond their reach and disregard them.

Cognitive development and functioning depends heavily on writing literacy. All too often promising ideas are mangled, if not massacred, by a deadening impenetrable prose. Research on the development of writing proficiency clarifies how perceived self-efficacy operates in concert with other self-regulatory factors in the mastery of this important skill (Zimmerman & A. Bandura, 1992). Enhancement of perceived writing efficacy by instruction raises, through different paths of influence, perceived self-efficacy for academic activities, personal standards for the quality of writing considered self-satisfying, and academic goals and attainments. Whereas verbal aptitude affects academic attainments only indirectly by raising personal standards of writing, the increased sense of academic efficacy promotes academic attainments both directly and by heightening aspirations.

Impact of Cognitive Self-Efficacy on Developmental Trajectories

Children's intellectual development cannot be isolated from the social relations within which it is imbedded or from its social consequences. It
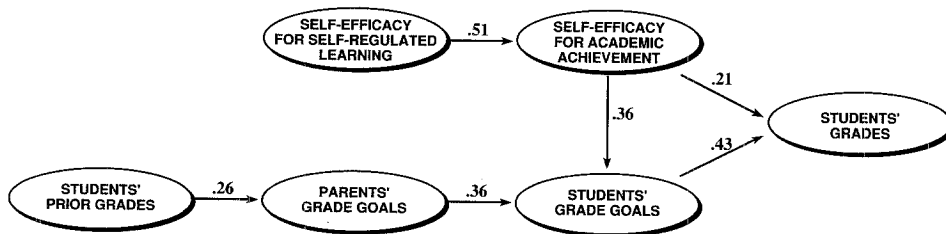

FIGURE 11   Path model of the influence of perceived self-efficacy and parental and children's goal setting on academic achievement (Zimmerman et al., 1992). From "Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal-Setting" by B. J. Zimmerman, A. Bandura, and M. Martinez-Pons, 1992, *American Educational Research Journal, 29*, p. 671. Copyright 1992 by the American Educational Research Association. Reprinted by permission.

must be analyzed from a sociocultural perspective. The broader developmental impact of perceived cognitive efficacy is revealed in a large-scale developmental project (Caprara, Pastorelli, & A. Bandura, 1992). Children's perceived self-efficacy was measured across a variety of domains including efficacy for self-regulated learning and mastery of different academic subject matters; efficacy to form and maintain social relationships; efficacy to resist peer pressures to engage in high risk behavior such as alcohol, drugs, and unprotected sex; and perceived self-efficacy to meet personal and social expectations. A principal components analysis of these different facets of self-efficacy yielded three factors: Perceived Self-Regulatory, Academic, and Social Efficacy. These forms of perceived self-efficacy were related to different patterns of interpersonal and emotional behavior.

The findings show that children who have a high sense of academic and self-regulative efficacy behave more prosocially, are more popular, and experience less rejection by their peers than do children who believe they lack these forms of academic efficacy (Table 1). Moreover, a low sense of academic and self-regulatory efficacy is associated with emotional irascibility, physical and verbal aggression, and ready disengagement of moral self-sanctions from harmful conduct. The impact of children's disbelief in their academic efficacy on socially discordant behavior becomes stronger as they grow older.

The relationship of perceived social efficacy to social and emotional behavior changes with age. For the younger children, perceived social self-efficacy bore no relationship to emotional and interpersonal patterns of behavior, whereas the academic forms of self-efficacy did. However, for the older children, their social and emotional behavior was related to their perceived social efficacy as well as to their perceived academic and self-regulatory efficacy. The adverse social and emotional effects of a low sense of cognitive efficacy are understandable. It is difficult for children to remain prosocially oriented and retain their emotional well-being in the face of repeated scholastic failures and snubbing by peers that erode their sense of intellectual efficacy. Peer affiliations promote different developmental courses depending on the types of values, standards of conduct, and lifestyles that are modeled and sanctioned by those with whom one regularly associates. Young children have neither had the time and consolidating experiences to develop their styles of behavior to the point where they differ greatly in conventionality, nor are their peer groupings firmly set. In adolescence, peer groups become more differentiated and influential. The activities in which they engage have greater potential to alter the future direction of personal development. Students who doubt their social as well as their intellectual efficacy are likely to gravitate to peers who do not subscribe to academic values and lifestyles. Over time, growing self-doubts

TABLE 1
Relationship of Various Facets of Perceived Self-Efficacy to
Social and Emotional Behavior

Social and Emotional Behavior	Domains of Self-Efficacy		
	Social	Self-Regulatory	Academic
Elementary School Children			
Self-ratings			
Prosocial behavior	.07	.20**	.39****
Emotional irascibility	.08	.08	−.19**
Physical and verbal aggression	.04	.02	−.18**
Moral disengagement	.01	−.21***	−.16**
Teacher ratings			
Prosocial behavior	.13*	.21**	.18**
Emotional irascibility	−.07	−.15*	−.20**
Physical and verbal aggression	−.01	−.04	−.17*
Peer ratings			
Prosocial behavior	−.07	.20**	.34****
Emotional irascibility	.01	−.08	−.14*
Physical and verbal aggression	.03	−.01	−.06
Popularity	−.01	.25****	.27****
Rejection	−.01	−.12*	−.16**
Junior High School Children			
Self-ratings			
Prosocial behavior	.37****	.42****	.30****
Emotional irascibility	−.15*	−.01	−.25***
Physical and verbal aggression	−.16*	−.13*	−.30****
Valuation of aggression	−.15*	−.17*	−.20*
Moral disengagement	−.26****	−.27****	−.37****

*$p < .05$. **$p < .01$. ***$p < .001$. ****$p < .0001$.

in cognitive competencies foreclose many occupational life courses, if not prosocial life paths. In these different ways, self-beliefs of cognitive self-efficacy can have reverberating effects on developmental trajectories well beyond the academic domain.

Sociocognitive Instructional Strategies

Sociocognitive theory advocates a multifaceted approach to promoting cognitive development. Ability is construed as a changeable attribute over which one can exercise some control. Guided mastery serves as the principal vehicle for the cultivation of competencies (A. Bandura, 1986). In this approach, cognitive modeling and instructive aids are used to convey relevant knowledge and strategies in graduated steps. Diverse opportunities are provided for guided practice in when and how to use cognitive strategies

in the solution of diverse problems. Activities, incentives, and personal challenges are structured in ways that ensure self-involving motivation and continual improvement. Instructive aids are progressively reduced as children's competencies are expanded. Self-directed mastery experiences are then arranged to strengthen and generalize the sense of personal efficacy. Each of these modes of influence is structured in ways that strengthen students' self-beliefs that they have what it takes to exercise control over their self-development.

TEACHERS' SELF-EFFICACY

The task of creating environments conducive to learning rests heavily on the talents and self-efficacy of teachers. Evidence indicates that classroom atmospheres are partly determined by teachers' beliefs in their instructional efficacy. Gibson and Dembo (1984) found that teachers who have a high sense of instructional efficacy devote more classroom time to academic learning, provide students who have difficulty learning with the help they need to succeed, and praise them for their accomplishments. In contrast, teachers who have a low sense of instructional efficacy spend more time on nonacademic pastimes, readily give up on students if they do not get quick results, and criticize them for their failures. Thus, teachers who believe strongly in their instructional efficacy create mastery experiences for their students. Those beset by self-doubts construct classroom environments that are likely to undermine students' sense of efficacy and cognitive development.

As Woolfolk and Hoy (1990) reported, teachers' sense of personal efficacy affects their general orientation toward the educational process as well as their specific instructional practices. Those who have a low sense of instructional efficacy favor a custodial orientation that relies heavily on extrinsic inducements and negative sanctions to get students to study. Teachers who believe strongly in their instructional efficacy support development of students' intrinsic interests and academic self-directedness. Ashton and Webb (1986) documented the cumulative impact of teachers' instructional self-efficacy on students' academic achievement. Teachers' beliefs concerning their efficacy predict students' level of mathematical and language achievement over the course of the academic year, with variations in students' entering ability statistically controlled.

COLLECTIVE SCHOOL EFFICACY

The preceding studies shed some light on how teachers' perceived self-efficacy affects the quality of instructional transactions and rate of

academic progress in individual classrooms. Teachers operate collectively within an interactive social system rather than as isolates. The belief systems of staffs create school cultures that can have vitalizing or demoralizing effects on how well schools function as a social system (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Good & Brophy, 1986; Purkey & Smith, 1983; Rutter, Maughan, Mortimore, Ouston, & Smith, 1979). The quality of leadership is also an important contributor to the development and maintenance of effective schools. Strong principals excel in their ability to get their staff to work together with a strong sense of purpose and to believe in their capabilities to surmount obstacles to educational attainments. Schools in which the staff collectively judge themselves as powerless to get students to achieve academic success convey a group sense of academic futility that can pervade the entire life of the school. School staff members who collectively judge themselves capable of promoting academic success imbue their schools with a positive atmosphere for development.

We have been conducting research on how collective school efficacy contributes to school-level achievement. Schools are the unit of analysis. There are two approaches to evaluating how collective efficacy affects organizational performance. In one approach, teachers' beliefs in their efficacy to promote academic learning in their own classrooms are aggregated for a given school. In the second approach, teachers' beliefs in their schools' capability as a whole are aggregated.

In activities requiring low system interdependence, members of the group need to coordinate their efforts, but the system's level of attainment is the sum total of the outcomes produced independently. In endeavors requiring high system interdependence, members must work jointly to achieve group outcomes. School systems rank at an intermediate level of interdependence. Although the level of academic progress achieved by a school largely reflects the summed contributions of teachers in their individual classrooms, schools involve organizational interdependencies that contribute to teachers' collective sense of efficacy.

Teachers' perceived collective efficacy changes markedly across grade levels (Figure 12). They express a low sense of efficacy to promote learning in students at the entry level. Because scholastic demands are minimal at entry, the low sense of instructional efficacy may partly reflect the perceived unpreparedness of the children for classroom instruction. In the early grades, when students are better acclimatized to school routines and academic demands are not too rigorous, teachers express a stronger sense that their school can educate their students. However, in succeeding grades, when the complexities of academic demands increase and scholastic deficits become increasingly salient, teachers view their schools as declining in instructional efficacy.

The demoralizing decline in staffs' beliefs in their schools instructional
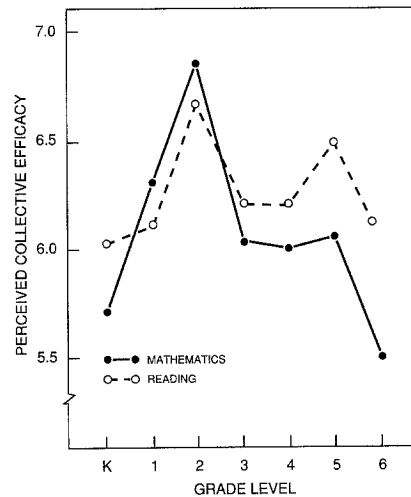
FIGURE 12   Changes in teachers' perceived collective efficacy to promote mathematical and reading competencies across different grade levels.

efficacy takes on special significance from evidence that teachers' perceived self-efficacy affects how well students manage school transitions (Midgley, Feldlaufer, & Eccles, 1989). Students who end up being taught by teachers with a low sense of efficacy suffer losses in perceived self-efficacy and performance expectations in the transition from elementary school to junior high school. This is particularly true for students who have a low opinion of their academic capabilities. Students self-doubts become even more severe if the teachers to whom they transfer harbor self-doubts about their capabilities to promote academic attainments.

To evaluate the role of perceived collective efficacy in how well schools perform, the pattern of hypothesized influences among factorially verified indices of teacher and student body characteristics, collective efficacy, and prior level of school achievement were tested by path analysis. Figure 13 shows the causal structure of the factors measured at the beginning of the academic year and school-level achievement in reading and mathematics at the end of the academic year. Adverse characteristics of student body populations reflecting largely socioeconomic disadvantage erode schools' sense of instructional efficacy. Thus, the higher the proportion of students from low socioeconomic levels and the higher the student turnover and absenteeism, the weaker the staffs' beliefs in their efficacy to achieve academic progress and the poorer the schools fare academically. Student body characteristics reflecting low racial composition and ethnic diversity are weakly linked to schools' prior achievements but have no direct influence on schools' collective sense of efficacy or on subsequent achievements. Longevity in teaching represents the total number of years teaching, years teaching in the same school and same grade, and the number of
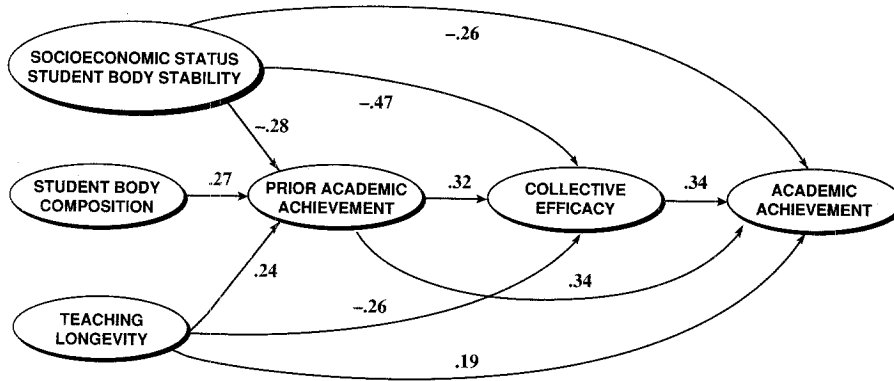
FIGURE 13 Path analysis showing the role of perceived collective efficacy in the casual structure of school-level achievement in reading and mathematics.

different grades taught. Teaching longevity has a small, positive effect on school achievement; but, interestingly, it also seems to create in teachers a jaundiced view of their schools' collective instructional efficacy. Staffs' collective sense of efficacy that they can promote high levels of academic progress contributes significantly to their schools' level of academic achievement.

Adverse student body characteristics influence schools' academic attainments more strongly by altering faculties' beliefs about their collective efficacy to motivate and educate their students than through direct effects on school achievement. Indeed, with staffs who firmly believe that, by their determined efforts, students are motivatable and teachable whatever their background, schools heavily populated with minority students of low socioeconomic status achieve at the highest percentile ranks based on national norms of language and mathematical competencies.

Parental Self-Efficacy and School Involvement

The family plays a key role in their childrens' success in school. Parents contribute to their children's intellectual growth in a variety of ways. They prepare their children for school, place a value on education, convey belief in their children's scholastic ability, encourage language development and comprehension through reading, set standards for them, establish regular homework habits, help them with their school work at home, keep track of their academic progress, reward their efforts, support school-related functions, assist with school activities, and participate in school governance or community advocacy groups for school improvement (Epstein, 1990). Some of the efforts to increase the effectiveness of schools are, therefore, aimed

at reestablishing connectedness between home, school, and the larger community. Self-efficacious parents regard education as a shared responsibility. The higher their sense of efficacy to instruct their children, the more they guide their children's learning and participate actively in the life of the school (Hoover-Dempsey, Bassler, & Brissie, in press). In contrast, parents who doubt their efficacy to help their children learn turn over their children's education entirely to teachers.

There is some evidence to suggest that teachers' sense of efficacy partly determines the level of parental participation in their children's scholastic activities (Hoover-Dempsey, Bassler, & Brissie, 1987). Self-efficacious teachers increase parents' ability to help their children learn. The resultant scholastic progress and parental support of school activities, in turn, raise teachers' sense of instructional efficacy. Because of the centrality of familial influence on children's scholastic success, the contribution of perceived efficacy to parental involvement in educational activities is of considerable import. This line of research further illustrates the need to broaden our view of the educational enterprise.

SUMMARY REMARKS

The substantial body of research on the diverse effects of perceived personal efficacy can be summarized as follows. People who have a low sense of efficacy in a given domain shy away from difficult tasks, which they perceive as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. They maintain a self-diagnostic focus rather than concentrate on how to perform successfully. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and on all kinds of adverse outcomes. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks. Because they diagnose insufficient performance as deficient aptitude, it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression.

A strong sense of efficacy enhances personal accomplishment in many ways. People with high efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters interest and deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They maintain a task-diagnostic focus that guides effective performance. They heighten and sustain their efforts in the face of failure. They attribute failure to insufficient effort or deficient knowledge and skills that are acquirable. They quickly recover their sense of efficacy after failures or setbacks. They

approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress, and lowers vulnerability to depression.

The multiple benefits of a sense of personal efficacy do not arise simply from the incantation of capability. Saying something should not be confused with believing it to be so. Simply saying that one is capable is not necessarily self-convincing. Self-efficacy beliefs are the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information conveyed enactively, vicariously, socially, and physiologically (A. Bandura, 1986). Once formed, efficacy beliefs contribute significantly to the level and quality of human functioning.

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