Self-Efficacy

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Glossary

Affective Processes: Processes regulating emotional states and elicitation of emotional reactions.
Cognitive Processes: Thinking processes involved in the acquisition, organization and use of information.
Motivation: Activation to action. Level of motivation is reflected in choice of courses of action, and in the intensity and persistence of effort.
Perceived Self-Efficacy: People's beliefs about their capabilities to produce effects.
Self-Regulation: Exercise of influence over one's own motivation, thought processes, emotional states and patterns of behavior.

Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They include cognitive, motivational, affective and selection processes.

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

In contrast, people who doubt their capabilities shy away from difficult tasks which they view as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully. 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 view 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. Lisa's notes: So here is the crux of the matter: How do we raise children with serious, chronic illnesses to have strong self- efficacy? It can literally be a matter of life and death.

I. Sources of Self-Efficacy

People's beliefs about their efficacy can be developed by four main sources of influence. The most effective way of creating a strong sense of efficacy is through mastery experiences. Successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established.

If people experience only easy successes they come to expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort. After people become convinced they have what it takes to succeed, they persevere in the face of adversity and quickly rebound from setbacks. By sticking it out through tough times, they emerge stronger from adversity.

The second way of creating and strengthening self-beliefs of efficacy is through the vicarious experiences provided by social models. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs that they too possess the capabilities to master comparable activities required to succeed. By the same token, observing others' fail despite high effort lowers observers' judgments of their own efficacy and undermines their efforts. The impact of modeling on perceived self-efficacy is strongly influenced by perceived similarity to the models. The greater the assumed similarity, the more persuasive are the models' successes and failures. If people see the models as very different from themselves their perceived self-efficacy is not much influenced by the models' behavior and the results its produces.

Modeling influences do more than provide a social standard against which to judge one's own capabilities. People seek proficient models who possess the competencies to which they aspire. Through their behavior and expressed ways of thinking, competent models transmit knowledge and teach observers effective skills and strategies for managing environmental demands. Acquisition of better means raises perceived self-efficacy.

Social persuasion is a third way of strengthening people's beliefs that they have what it takes to succeed. People who are persuaded verbally that they possess the capabilities to

master given activities are likely to mobilize greater effort and sustain it than if they harbor self-doubts and dwell on personal deficiencies when problems arise. To the extent that persuasive boosts in perceived self-efficacy lead people to try hard enough to succeed, they promote development of skills and a sense of personal efficacy.

It is more difficult to instill high beliefs of personal efficacy by social persuasion alone than to undermine it. Unrealistic boosts in efficacy are quickly disconfirmed by disappointing results of one's efforts. But people who have been persuaded that they lack capabilities tend to avoid challenging activities that cultivate potentialities and give up quickly in the face of difficulties. By constricting activities and undermining motivation, disbelief in one's capabilities creates its own behavioral validation.

Successful efficacy builders do more than convey positive appraisals. In addition to raising people's beliefs in their capabilities, they structure situations for them in ways that bring success and avoid placing people in situations prematurely where they are likely to fail often. They measure success in terms of self-improvement rather than by triumphs over others.

People also rely partly on their somatic and emotional states in judging their capabilities. They interpret their stress reactions and tension as signs of vulnerability to poor performance. In activities involving strength and stamina, people judge their fatigue, aches and pains as signs of physical debility. Mood also affects people's judgments of their personal efficacy. Positive mood enhances perceived self-efficacy, despondent mood diminishes it. The fourth way of modifying self-beliefs of efficacy is to reduce people's stress reactions and alter their negative emotional proclivities and misinterpretations of their physical states.

It is not the sheer intensity of emotional and physical reactions that is important but rather how they are perceived and interpreted. People who have a high sense of efficacy are likely to view their state of affective arousal as an energizing facilitator of performance, whereas those who are beset by self-doubts regard their arousal as a debilitator. Physiological indicators of efficacy play an especially influential role in health functioning and in athletic and other physical activities.

II. Efficacy-Activated Processes

Much research has been conducted on the four major psychological processes through which self-beliefs of efficacy affect human functioning.

A. Cognitive Processes

The effects of self-efficacy beliefs on cognitive processes take a variety of forms. Much human behavior, being purposive, is regulated by forethought embodying valued 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.*

Most courses of action are initially organized in thought. People's beliefs in their efficacy shape 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. A major function of thought is to enable people to predict events and to develop ways to control those 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, failures and setbacks that have significant repercussions. Indeed, when people are faced with the tasks of managing difficult environmental demands under taxing circumstances, those who are beset by self-doubts about their efficacy become more and more erratic in their analytic thinking, lower their aspirations and the quality of their performance deteriorates. In contrast, those who maintain a resilient sense of efficacy set themselves challenging goals and use good analytic thinking which pays off in performance accomplishments.

B. Motivational Processes

Self-beliefs of efficacy play a key role in the self-regulation of motivation. 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.

There are three different forms of cognitive motivators around which different theories have been built. They include causal attributions, outcome expectancies, and cognized goals. The corresponding theories are attribution theory, expectancy-value theory and goal theory, respectively. Self-efficacy beliefs operate in each of these types of cognitive motivation. Self-efficacy beliefs influence causal attributions. People who regard themselves as highly efficacious attribute their failures to insufficient effort, those who regard themselves as inefficacious attribute their failures to low ability. Causal attributions affect motivation, performance and affective reactions mainly through beliefs of self-efficacy.

In expectancy-value theory, motivation is regulated by the expectation that a given course of 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 on their beliefs about the likely outcomes of performance. The motivating influence of outcome expectancies is thus partly governed by self-beliefs of efficacy. 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 influence of perceived self-efficacy.

The capacity to exercise self-influence by goal challenges and evaluative reaction to one's own attainments provides a major cognitive mechanism of motivation. A large body of evidence shows that explicit, challenging goals enhance and sustain motivation. 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.

Motivation based on goals or personal standards is governed by three types of self influences. They include self-satisfying and self-dissatisfying 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 contributes to performance accomplishments.

C. Affective Processes

People's beliefs in their coping capabilities affect how much stress and depression they experience in threatening or difficult situations, as well as their level of motivation. Perceived self-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. Perceived coping self-efficacy regulates avoidance behavior as well as anxiety arousal. The stronger the sense of self-efficacy, the bolder people are in taking on taxing and threatening activities.

Anxiety arousal 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.

Both perceived coping self-efficacy and thought control efficacy operate jointly to reduce anxiety and avoidant behavior.

Social cognitive theory prescribes mastery experiences as the principal means of personality change. Guided mastery is a powerful vehicle for instilling a robust sense of coping efficacy in people whose functioning is seriously impaired by intense apprehension and phobic self-protective reactions. Mastery experiences are structured in ways to build coping skills and instill beliefs that one can exercise control over potential threats. Intractable phobics, of course, are not about to do what they dread. One must, therefore, create an environment so that incapacitated phobics can perform successfully despite themselves. This is achieved by enlisting a variety of performance mastery aids. Feared activities are first modeled to show people how to cope with threats and to disconfirm their worst fears. Coping tasks are broken down into subtasks of easily mastered steps. Performing feared activities together with the therapist further enables phobics to do things they would resist doing by themselves. Another way of overcoming resistance is to use graduated time. Phobics will refuse threatening tasks if they will have to endure stress for a long time. But they will risk them for a short period. As their coping efficacy increases the time they perform the activity is extended. Protective aids and dosing the severity of threats also help to restore and develop a sense of coping efficacy.

After functioning is fully restored, the mastery aids are withdrawn to verify that coping successes stem from personal efficacy rather than from mastery aids. Self-directed mastery experiences, designed to provide varied confirmatory tests of coping capabilities, are then arranged to strengthen and generalize the sense of coping efficacy. Once people develop a resilient sense of efficacy they can withstand difficulties and adversities without adverse effects.

Guided mastery treatment achieves widespread psychological changes in a relatively short time. It eliminates phobic behavior and anxiety and biological stress reactions, creates positive attitudes and eradicates phobic ruminations and nightmares. Evidence that achievement of coping efficacy profoundly affects dream activity is a particularly striking generalized impact.

A low sense of efficacy to exercise control produces depression as well as anxiety. It does so in several different ways. One route to depression is through unfulfilled aspiration. People who impose on themselves standards of self-worth they judge 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 social inefficacy to develop satisfying and supportive relationships increases vulnerability to depression through social isolation. 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.

Other efficacy-activated processes in the affective domain concern the impact of perceived coping self-efficacy on biological systems that affect health functioning. Stress has been implicated as an important contributing factor to many physical dysfunctions. Controllability appears to be a key organizing principle regarding the nature of these stress effects. It is not stressful life conditions per se, but the perceived inability to manage them that is debilitating. Thus, exposure to stressors with ability to control them has no adverse biological effects. But exposure to the same stressors without the ability to control them impairs the immune system. The impairment of immune function increases susceptibility to infection, contributes to the development of physical disorders and accelerates the progression of disease.

Biological systems are highly interdependent. A weak sense of efficacy to exercise control over stressors activates autonomic reactions, catecholamine secretion and release of endogenous opioids. These biological systems are involved in the regulation of the immune system. Stress activated in the process of acquiring coping capabilities may have different effects than stress experienced in aversive situations with no prospect in sight of ever gaining any self-protective efficacy. There are substantial evolutionary benefits to experiencing enhanced immune function during development of coping capabilities vital for effective adaptation. It would not be evolutionarily advantageous if acute stressors invariably impaired immune function, because of their prevalence in everyday life. If this were the case, people would experience high vulnerability to infective agents that would quickly do them in. There is some evidence that providing people with effective means for managing stressors may have a positive effect on immune function. Moreover, stress aroused while gaining coping mastery over stressors can enhance different components of the immune system.

There are other ways in which perceived self-efficacy serves to promote health. Lifestyle habits can enhance or impair health. This enables people to exert behavioral influence over their vitality and quality of health. Perceived self-efficacy affects every phase of personal change--whether people even consider changing their health habits; whether they enlist the motivation and perseverance needed to succeed should they choose to do so; and how well they maintain the habit changes they have achieved. The stronger the perceived self-regulatory efficacy the more successful people are in reducing health-impairing habits and adopting and integrating health-promoting habits into their regular lifestyle. Comprehensive community programs designed to prevent cardiovascular disease by altering risk-related habits reduce the rate of morbidity and mortality.

D. 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 those they encounter day in and day out. People are partly the product of their environment. Therefore, beliefs of personal efficacy can shape the course lives take by influencing the types of activities and environments people choose. 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 efficacy decisional determinant 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. The higher the level of people's perceived self-efficacy the wider the range of career options they seriously consider, the greater their interest in them, and the better they prepare themselves educationally for the occupational pursuits they choose and the greater is their success. Occupations structure a good part of people's lives and provide them with a major source of personal growth.

III. Adaptive Benefits of Optimistic Self-Beliefs of Efficacy

There is a growing body of evidence that human accomplishments and positive well-being require an optimistic sense of personal efficacy. This is because ordinary social realities are strewn with difficulties. They are full of impediments, adversities, setbacks, frustrations, and inequities. People must have a robust sense of personal efficacy to sustain the perseverant effort needed to succeed. In pursuits strewn with obstacles, realists either foresake them, abort their efforts prematurely when difficulties arise or become cynical about the prospects of effecting significant changes.

It is widely believed that misjudgment breeds personal problems. Certainly, gross miscalculation can get one into trouble. However, the functional value of accurate self-appraisal depends on the nature of the activity. Activities in which mistakes can produce costly or injurious consequences call for accurate self- appraisal of capabilities. It is a different matter where difficult accomplishments can produce substantial personal and social benefits and the costs involve one's time, effort, and expendable resources. People with a high sense of efficacy have the staying power to endure the obstacles and setbacks that characterize difficult undertakings.

When people err in their self-appraisal they tend to overestimate their capabilities. This is a benefit rather than a cognitive failing to be eradicated. If efficacy beliefs always reflected only what people can do routinely they would rarely fail but they would not set aspirations beyond their immediate reach nor mount the extra effort needed to surpass their ordinary performances.

People who experience much distress have been compared in their skills and beliefs in their capabilities with those who do not suffer from such problems. The findings show that it is often the normal people who are distorters of reality. But they display self-enhancing biases and distort in the positive direction. People who are socially anxious or prone to depression are often just as socially skilled as those who do not suffer from such problems. But the normal ones believe they are much more adept than they really are.

The nondepressed people also have a stronger belief that they exercise some control over situations.

Social reformers strongly believe that they can mobilize the collective effort needed to bring social change. Although their beliefs are rarely fully realized they sustain reform efforts that achieve important gains. Were social reformers to be entirely realistic about the prospects of transforming social systems they would either forego the endeavor or fall easy victim to discouragement. Realists may adapt well to existing realities. But those with a tenacious self-efficacy are likely to change those realities.

Innovative achievements also require a resilient sense of efficacy. Innovations require heavy investment of effort over a long period with uncertain results. Moreover, innovations that clash with existing preferences and practices meet with negative social reactions. It is, therefore, not surprising that one rarely finds realists in the ranks of innovators and great achievers.

In his delightful book, titled, *Rejection*, John White provides vivid testimony, that the striking characteristic of people who have achieved eminence in their fields is an inextinguishable sense of personal efficacy and a firm belief in the worth of what they are doing. This resilient self-belief system enabled them to override repeated early rejections of their work.

Many of our literary classics brought their authors countless rejections. James Joyce's, the Dubliners, was rejected by 22 publishers. Gertrude Stein continued to submit poems to editors for 20 years before one was finally accepted. Over a dozen publishers rejected a manuscript by e. e. cummings. When he finally got it published, by his mother, the dedication read, in upper case: With no thanks to . . . followed by the list of 16 publishers who had rejected his manuscript.

Early rejection is the rule, rather than the exception, in other creative endeavors. The Impressionists had to arrange their own exhibitions because their works were routinely rejected by the Paris Salon. Van Gogh sold only one painting during his lifetime. Rodin was rejected three times for admission to the 'cole des Beaux-Arts.

The musical works of most renowned composers were initially greeted with derision. Stravinsky was run out of town by enraged Parisiens and critics when he first served them the Rite of Spring. Entertainers in the contemporary pop culture have not fared any better. Decca records rejected a recording contract with the Beatles with the non-prophetic evaluation, "We don't like their sound. Groups of guitars are on the way out." Columbia records was next to turn them down. [And see this page]

Theories and technologies that are ahead of their time usually suffer repeated rejections. The rocket pioneer, Robert Goddard, was bitterly rejected by his scientific peers on the grounds that rocket propulsion would not work in the rarefied atmosphere of outer space. Because of the cold reception given to innovations, the time between conception and technical realization is discouragingly long.

The moral of the *Book of Rejections* is that rejections should not be accepted too readily as indicants of personal failings. To do so is self-limiting.

In sum, the successful, the venturesome, the sociable, the nonanxious, the nondepressed, the social reformers, and the innovators take an optimistic view of their personal capabilities to exercise influence over events that affect their lives. If not unrealistically exaggerated, such self-beliefs foster positive well-being and human accomplishments.

Many of the challenges of life are group problems requiring collective effort to produce significant change. The strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve the problems they face and improve their lives through unified effort. People's beliefs in their collective efficacy influence what they choose to do as a group, how much effort they put into it, their endurance when collective efforts fail to produce quick results, and their likelihood of success.

IV. Development and Exercise of Self-Efficacy Over the Lifespan

Different periods of life present certain types of competency demands for successful functioning. These normative changes in required competencies with age do not represent lock-step stages through which everyone must inevitably pass. There are many pathways through life and, at any given period, people vary substantially in how efficaciously they manage their lives. The sections that follow provide a brief analysis of the characteristic developmental changes in the nature and scope of perceived self-efficacy over the course of the lifespan.

A. Origins of a Sense of Personal Agency

The newborn comes without any sense of self. Infants exploratory experiences in which they see themselves produce effects by their actions provide the initial basis for developing a sense of efficacy. Shaking a rattle produces predictable sounds, energetic kicks shake their cribs, and screams bring adults. By repeatedly observing that environmental events occur with action, but not in its absence, infants learn that actions produce effects. Infants who experience success in controlling environmental events become more attentive to their own behavior and more competent in learning new efficacious responses, than are infants for whom the same environmental events occur regardless of how they behave.

Development of a sense of personal efficacy requires more than simply producing effects by actions. Those actions must be perceived as part of oneself. The self becomes differentiated from others through dissimilar experience. If feeding oneself brings comfort, whereas seeing others feed themselves has no similar effect, one's own activity becomes distinct from all other persons. As infants begin to mature those around them refer to them and treat them as distinct persons. Based on growing personal and social experiences they eventually form a symbolic representation of themselves as a distinct self.

B. Familial Sources of Self-Efficacy

Young children must gain self-knowledge of their capabilities in broadening areas of functioning. They have to develop, appraise and test their physical capabilities, their social competencies, their linguistic skills, and their cognitive skills for comprehending and managing the many situations they encounter daily. Development of sensorimotor capabilities greatly expands the infants' exploratory environment and the means for acting upon it. These early exploratory and play activities, which occupy much of children's waking hours, provide opportunities for enlarging their repertoire of basic skills and sense of efficacy.

Successful experiences in the exercise of personal control are central to the early development of social and cognitive competence. Parents who are responsive to their infants' behavior, and who create opportunities for efficacious actions by providing an enriched physical environment and permitting freedom of movement for exploration, have infants who are accelerated in their social and cognitive development. Parental responsiveness increases cognitive competence, and infants' expanded capabilities elicit greater parental responsiveness in a two-way influence. Development of language provides children with the symbolic means to reflect on their experiences and what others tell them about their capabilities and, thus, to expand their self-knowledge of what they can and cannot do.

The initial efficacy experiences are centered in the family. But as the growing child's social world rapidly expands, peers become increasingly important in children's developing self-knowledge of their capabilities. It is in the context of peer relations that social comparison comes strongly into play. At first, the closest comparative age-mates are siblings. Families differ in number of siblings, how far apart in age they are, and in their sex distribution. Different family structures, as reflected in family size, birth order, and sibling constellation patterns, create different social comparisons for judging one's personal efficacy. Younger siblings find themselves in the unfavorable position of judging their capabilities in relation to older siblings who may be several years advanced in their development.

C. Broadening of Self-Efficacy Through Peer Influences

Children's efficacy-testing experiences change substantially as they move increasingly into the larger community. It is in peer relationships that they broaden self-knowledge of their capabilities. Peers serve several important efficacy functions. Those who are most experienced and competent provide models of efficacious styles of thinking and behavior. A vast amount of social learning occurs among peers. In addition, age-mates provide highly informative comparisons for judging and verifying one's self-efficacy. Children are, therefore, especially sensitive to their relative standing among the peers in activities that determine prestige and popularity.

Peers are neither homogeneous nor selected indiscriminately. Children tend to choose peers who share similar interests and values. Selective peer association will promote self-

efficacy in directions of mutual interest, leaving other potentialities underdeveloped. Because peers serve as a major influence in the development and validation of self-efficacy, disrupted or impoverished peer relationships can adversely affect the growth of personal efficacy. A low sense of social efficacy can, in turn, create internal obstacles to favorable peer relationships. Thus, children who regard themselves as socially inefficacious withdraw socially, perceive low acceptance by their peers and have a low sense of self-worth. There are some forms of behavior where a high sense of efficacy may be socially alienating rather than socially affiliating. For example, children who readily resort to aggression perceive themselves as highly efficacious in getting things they want by aggressive means.

D. School as an Agency for Cultivating Cognitive Self-Efficacy

During the crucial formative period of children's lives, the school functions as the primary setting for the cultivation and social validation of cognitive competencies. School is the place where children develop the cognitive competencies and acquire the knowledge and problem-solving skills essential for participating effectively in the larger society. Here their knowledge and thinking skills are continually tested, evaluated, and socially compared. As children master cognitive skills, they develop a growing sense of their intellectual efficacy. Many social factors, apart from the formal instruction, such as peer modeling of cognitive skills, social comparison with the performances of other students, motivational enhancement through goals and positive incentives, and teachers interpretations of children's successes and failures in ways that reflect favorably or unfavorably on their ability also affect children's judgments of their intellectual efficacy.

The task of creating learning environments conducive to development of cognitive skills rests heavily on the talents and self-efficacy of teachers. Those who have a high sense of efficacy about their teaching capabilities can motivate their students and enhance their cognitive development. Teachers who have a low sense of instructional efficacy favor a custodial orientation that relies heavily on negative sanctions to get students to study.

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. 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. Schools in which staff members collectively judge themselves capable of promoting academic success imbue their schools with a positive atmosphere for development that promotes academic attainments regardless of whether they serve predominantly advantaged or disadvantaged students.

Students' belief in their capabilities to master academic activities affects their aspirations, their level of interest in academic activities, and their academic accomplishments. There are a number of school practices that, for the less talented or ill prepared, tend to convert instructional experiences into education in inefficacy. These include lock-step sequences of instruction, which lose many children along the way; ability groupings which further

diminish the perceived self-efficacy of those cast in the lower ranks; and competitive practices where many are doomed to failure for the success of a relative few.

Classroom structures affect the development of intellectual self-efficacy, in large part, by the relative emphasis they place on social comparison versus self-comparison appraisal. Self- appraisals of less able students suffer most when the whole group studies the same material and teachers make frequent comparative evaluations. Under such a monolithic structure students rank themselves according to capability with high consensus. Once established, reputations are not easily changed. In a personalized classroom structure, individualized instruction tailored to students' knowledge and skills enables all of them to expand their competencies and provides less basis for demoralizing social comparison. As a result, students are more likely to compare their rate of progress to their personal standards than to the performance of others. Self-comparison of improvement in a personalized classroom structure raises perceived capability. Cooperative learning structures, in which students work together and help one another also tend to promote more positive self-evaluations of capability and higher academic attainments than do individualistic or competitive ones.

E. Growth of Self-Efficacy Through Transitional Experiences of Adolescence

Each period of development brings with it new challenges for coping efficacy. As adolescents approach the demands of adulthood, they must learn to assume full responsibility for themselves in almost every dimension of life. This requires mastering many new skills and the ways of adult society. Learning how to deal with pubertal changes, emotionally invested partnerships and sexuality becomes a matter of considerable importance. The task of choosing what lifework to pursue also looms large during this period. These are but a few of the areas in which new competencies and self-beliefs of efficacy have to be developed.

With growing independence during adolescence some experimentation with risky behavior is not all that uncommon. Adolescents expand and strengthen their sense of efficacy by learning how to deal successfully with potentially troublesome matters in which they are unpracticed as well as with advantageous life events. Insulation from problematic situations leaves one ill-prepared to cope with potential difficulties. Whether adolescents foresake risky activities or become chronically enmeshed in them is determined by the interplay of personal competencies, self- management efficacy and the prevailing influences in their lives.

Impoverished hazardous environments present especially harsh realities with minimal resources and social supports for culturally-valued pursuits, but extensive modeling, incentives and social supports for transgressive styles of behavior. Such environments severely tax the coping efficacy of youth enmeshed in them to make it through adolescence in ways that do not irreversibly foreclose many beneficial life paths.

Adolescence has often been characterized as a period of psychosocial turmoil. While no period of life is ever free of problems, contrary to the stereotype of "storm and stress,"

most adolescents negotiate the important transitions of this period without undue disturbance or discord. However, youngsters who enter adolescence beset by a disabling sense of inefficacy transport their vulnerability to distress and debility to the new environmental demands. The ease with which the transition from childhood to the demands of adulthood is made similarly depends on the strength of personal efficacy built up through prior mastery experiences.

F. Self-Efficacy Concerns of Adulthood

Young adulthood is a period when people have to learn to cope with many new demands arising from lasting partnerships, marital relationships, parenthood, and occupational careers. As in earlier mastery tasks, a firm sense of self-efficacy is an important contributor to the attainment of further competencies and success. Those who enter adulthood poorly equipped with skills and plagued by self-doubts find many aspects of their adult life stressful and depressing.

Beginning a productive vocational career poses a major transitional challenge in early adulthood. There are a number of ways in which self-efficacy beliefs contribute to career development and success in vocational pursuits. In preparatory phases, people's perceived self-efficacy partly determines how well they develop the basic cognitive, self-management and interpersonal skills on which occupational careers are founded. As noted earlier, beliefs concerning one's capabilities are influential determinants of the vocational life paths that are chosen.

It is one thing to get started in an occupational pursuit, it is another thing to do well and advance in it. Psychosocial skills contribute more heavily to career success than do occupational technical skills. Development of coping capabilities and skills in managing one's motivation, emotional states and thought processes increases perceived self-regulatory efficacy. The higher the sense of self-regulatory efficacy the better the occupational functioning. Rapid technological changes in the modern workplace are placing an increasing premium on higher problem-solving skills and resilient self-efficacy to cope effectively with job displacements and restructuring of vocational activities.

The transition to parenthood suddenly thrusts young adults into the expanded role of both parent and spouse. They now not only have to deal with the ever-changing challenges of raising children but to manage interdependent relationships within a family system and social links to many extrafamilial social systems including educational, recreational, medical, and caregiving facilities. Parents who are secure in their parenting efficacy shepherd their children adequately through the various phases of development without serious problems or severe strain on the marital relationship. But it can be a trying period for those who lack a sense of efficacy to manage the expanded familial demands. They are highly vulnerable to stress and depression.

Increasing numbers of mothers are joining the work force either by economic necessity or personal preference. Combining family and career has now become the normative

pattern. This requires management of the demands of both familial and occupational roles. Because of the cultural lag between societal practices and the changing status of women, they continue to bear the major share of the homemaking responsibility. Women who have a strong sense of efficacy to manage the multiple demands of family and work and to enlist their husbands' aid with childcare experience a positive sense of well-being. But those who are beset by self-doubts in their ability to combine the dual roles suffer physical and emotional strain.

By the middle years, people settle into established routines that stabilize their sense of personal efficacy in the major areas of functioning. However, the stability is a shaky one because life does not remain static. Rapid technological and social changes constantly require adaptations calling for self-reappraisals of capabilities. In their occupations, the middle-aged find themselves pressured by younger challengers. Situations in which people must compete for promotions, status, and even work itself, force constant self-appraisals of capabilities by means of social comparison with younger competitors.

G. Reappraisals of Self-Efficacy With Advancing Age

The self-efficacy issues of the elderly center on reappraisals and misappraisals of their capabilities. Biological conceptions of aging focus extensively on declining abilities. Many physical capacities do decrease as people grow older, thus, requiring reappraisals of self-efficacy for activities in which the biological functions have been significantly affected. However, gains in knowledge, skills, and expertise compensate some loss in physical reserve capacity. When the elderly are taught to use their intellectual capabilities, their improvement in cognitive functioning more than offsets the average decrement in performance over two decades. Because people rarely exploit their full potential, elderly persons who invest the necessary effort can function at the higher levels of younger adults. By affecting level of involvement in activities, perceived self- efficacy can contribute to the maintenance of social, physical and intellectual functioning over the adult life span.

Older people tend to judge changes in their intellectual capabilities largely in terms of their memory performance. Lapses and difficulties in memory that young adults dismiss are inclined to be interpreted by older adults as indicators of declining cognitive capabilities. Those who regard memory as a biologically shrinking capacity with aging have low faith in their memory capabilities and enlist little effort to remember things. Older adults who have a stronger sense of memory efficacy exert greater cognitive effort to aid their recall and, as a result, achieve better memory.

Much variability exists across behavioral domains and educational and socioeconomic levels, and there is no uniform decline in beliefs in personal efficacy in old age. The persons against whom the elderly compare themselves contribute much to the variability in perceived self-efficacy. Those who measure their capabilities against people their age are less likely to view themselves as declining in capabilities than if younger cohorts are used in comparative self-appraisal. Perceived cognitive inefficacy is accompanied by lowered intellectual performances. A declining sense of self-efficacy, which often may

stem more from disuse and negative cultural expectations than from biological aging, can thus set in motion self-perpetuating processes that result in declining cognitive and behavioral functioning. People who are beset with uncertainties about their personal efficacy not only curtail the range of their activities but undermine their efforts in those they undertake. The result is a progressive loss of interest and skill.

Major life changes in later years are brought about by retirement, relocation, and loss of friends or spouses. Such changes place demands on interpersonal skills to cultivate new social relationships that can contribute to positive functioning and personal well-being. Perceived social inefficacy increases older person's vulnerability to stress and depression both directly and indirectly by impeding development of social supports which serve as a buffer against life stressors.

The roles into which older adults are cast impose sociocultural constraints on the cultivation and maintenance of perceived self-efficacy. As people move to older-age phases most suffer losses of resources, productive roles, access to opportunities and challenging activities. Monotonous environments that require little thought or independent judgment diminish the quality of functioning, intellectually challenging ones enhance it. Some of the declines in functioning with age result from sociocultural dispossession of the environmental support for it. It requires a strong sense of personal efficacy to reshape and maintain a productive life in cultures that cast their elderly in powerless roles devoid of purpose. In societies that emphasize the potential for self-development throughout the lifespan, rather than psychophysical decline with aging, the elderly tend to lead productive and purposeful lives.

Summary

Perceived self-efficacy is concerned with people's beliefs in their capabilities to exercise control over their own functioning and over events that affect their lives. Beliefs in personal efficacy affect life choices, level of motivation, quality of functioning, resilience to adversity and vulnerability to stress and depression. People's beliefs in their efficacy are developed by four main sources of influence. They include mastery experiences, seeing people similar to oneself manage task demands successfully, social persuasion that one has the capabilities to succeed in given activities, and inferences from somatic and emotional states indicative of personal strengths and vulnerabilities. Ordinary realities are strewn with impediments, adversities, setbacks, frustrations and inequities. People must, therefore, have a robust sense of efficacy to sustain the perseverant effort needed to succeed. Succeeding periods of life present new types of competency demands requiring further development of personal efficacy for successful functioning. The nature and scope of perceived self-efficacy undergo changes throughout the course of the lifespan.

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Current Directions in Self-efficacy Research

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Two decades have now passed since Bandura (1977) first introduced the construct of self-efficacy with the seminal publication of "Self-efficacy: Toward a Unifying Theory of Behavioral Change." A decade later, Bandura (1986) situated the construct within a social cognitive theory of human behavior that diverged from the prevalent cognitivism of the day and embedded cognitive development within a sociostructural network of influences. More recently, Bandura (1997) published Self-efficacy: The Exercise of Control, in which he further situated self-efficacy within a theory of personal and collective agency that operates in concert with other sociocognitive factors in regulating human well-being and attainment. In this volume, Bandura also addressed the major facets of agency -- the nature and structure of self-efficacy beliefs, their origins and effects, the processes through which such self-beliefs operate, and the modes by which they can be created and strengthened. In addition, Bandura reviewed a vast body of research on each of these aspects of agency in diverse applications of the theory.

During these two decades, the tenets of the self-efficacy component of social cognitive theory have been widely tested in varied disciplines and settings and have received support from a growing body of findings from diverse fields. Self-efficacy beliefs have been found related to clinical problems such as phobias (Bandura, 1983), addiction (Marlatt, Baer, & Quigley, 1995), depression (Davis & Yates, 1982), social skills (Moe & Zeiss, 1982), assertiveness (Lee, 1983, 1984); to stress in a variety of contexts (Jerusalem & Mittag, 1995); to smoking behavior (Garcia, Schmitz, & Doerfler, 1990); to pain control (Manning & Wright, 1983); to health (O'Leary, 1985); and to athletic performance (Barling & Abel, 1983; Lee, 1982).

Self-efficacy beliefs have also received increasing attention in educational research, primarily in studies of academic motivation and of self-regulation (Pintrich & Schunk, 1995). In this arena, self-efficacy researchers have focused on three areas. Researchers in the first area have explored the link between efficacy beliefs and college major and career choices, particularly in science and mathematics (see Lent & Hackett, 1987, for a review). This line of inquiry has important implications for counseling and vocational psychology theory and practice, given that findings have provided insights into the career development of young men and women and can be used to develop career intervention strategies. Findings from the second area suggest that the efficacy beliefs of teachers are related to their instructional practices and to various student outcomes (Ashton & Webb, 1986). In the third area, researchers have reported that students' self-efficacy beliefs are correlated with other motivation constructs and with students' academic performances and achievement. Constructs in these studies have included attributions, goal setting, modeling, problem solving, test and domain-specific anxiety, reward contingencies, self-

regulation, social comparisons, strategy training, other self-beliefs and expectancy constructs, and varied academic performances across domains.

Self-efficacy's broad application across various domains of behavior has accounted for its popularity in contemporary motivation research (Graham & Weiner, 1996). Now that two decades have passed, the time seems propitious to assess the direction that this bourgeoning line of inquiry has taken in academic contexts. To that end, the purpose of this chapter is to acquaint the reader with the defining characteristics of self-efficacy beliefs, outline some problems that have plagued research in this area, examine current directions in self-efficacy research, and suggest strategies to guide future directions. To set the foundation for this exploration, a brief overview of the role of self-beliefs in Bandura's social cognitive theory will first be offered. This will be followed by a more in-depth examination of the sources, effects, and defining characteristics of self-efficacy beliefs, as well as of some problems that affect research. Because various reviews of the influence of self-efficacy in academic settings can be found elsewhere (see Bandura, 1997; Hackett, 1995; Lent & Hackett, 1987; Maddux & Stanley, 1986; Multon, Brown, & Lent, 1991; Pajares, 1996c; Schunk, 1989, 1991; Zimmerman, 1995), such a review will not be part of this chapter. Instead, major findings will be identified and discussed insofar as they inform the directions charted. Last, suggestions are offered that may help guide subsequent research and practice.

Self-beliefs and Bandura's Social Cognitive Theory - A Brief Overview

According to Bandura's (1986) social cognitive theory, individuals possess a self system that enables them to exercise a measure of control over their thoughts, feelings, motivation, and actions. This self system provides reference mechanisms and a set of subfunctions for perceiving, regulating, and evaluating behavior, which results from the interplay between the system and environmental sources of influence. As such, it serves a self-regulatory function by providing individuals with the capability to influence their own cognitive processes and actions and thus alter their environments.

How people interpret the results of their own performance attainments informs and alters their environments and their self-beliefs which, in turn, inform and alter subsequent performance. 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. In general, Bandura provided a view of human behavior in which the beliefs that people have about themselves are key elements in the exercise of control and personal agency and in which individuals are viewed both as products and as producers of their own environments and of their social systems.

Bandura (1986) wrote that, through the process of self-reflection, individuals are able to evaluate their experiences and thought processes (also see Dewey, 1933). According to this view, what people know, the skills they possess, or what they have previously accomplished are not always good predictors of subsequent attainments because the beliefs they hold about their capabilities powerfully influence the ways in which they will

behave. Consequently, how people behave is both mediated by their beliefs about their capabilities and can often be better predicted by these beliefs than by the results of their previous performances. This does not mean that people can accomplish tasks beyond their capabilities simply by believing that they can, for competent functioning requires harmony between self-beliefs on the one hand and possessed skills and knowledge on the other. Rather, it means that self-perceptions of capability help determine what individuals do with the knowledge and skills they have. More important, self-efficacy beliefs are critical determinants of how well knowledge and skill are acquired in the first place.

The process of creating and using these self-beliefs is an intuitive one: individuals engage in a behavior, interpret the results of their actions, use these interpretations to create and develop beliefs about their capability to engage in subsequent behaviors in similar domains, and behave in concert with the beliefs created. In school, for example, the beliefs that students develop about their academic capabilities help determine what they do with the knowledge and skills they have learned. Consequently, their academic performances are in part the result of what they come to believe that they have accomplished and can accomplish. This helps explain why students' academic performances may differ markedly when they have similar ability. Researchers have suggested that these self-beliefs may play a mediational role in relation to cognitive engagement and that enhancing them might lead to increased use of cognitive strategies that, in turn, lead to improve performance (Pintrich & De Groot, 1990). This view of self-belief as a mediating construct in human behavior is consistent with those of numerous scholars and theorists who have argued that the potent evaluative nature of beliefs makes them a filter through which new phenomena are interpreted and subsequent behavior mediated (Abelson, 1979; Calderhead & Robson, 1991; Dewey, 1933; Goodman, 1988; James, 1885/1975; Lewis, 1991; Maslow, 1943; Mead, 1982; Nespor, 1987; Nisbett & Ross, 1980; Pajares, 1992; Posner, Strike, Hewson, & Gertzog, 1982; Rokeach, 1960, 1968).

Self-efficacy Component of Social Cognitive Theory

The self-beliefs that individuals use to exercise a measure of control over their environments include self-efficacy beliefs -- "beliefs in one's capability to organize and execute the courses of action required to manage prospective situations" (Bandura, 1997, p. 2). Because self-efficacy beliefs are concerned with individuals' perceived capabilities to produce results and to attain designated types of performance, they differ from related conceptions of personal competence that form the core constructs of other theories. Self-efficacy judgments are both more task- and situation-specific, contextual if you will, and individuals make use of these judgments in reference to some type of goal. To better understand the nature of self-efficacy beliefs it may be useful to explain how they are acquired, how they influence motivational and self-regulatory process, and how they differ from similar or related conceptions of self-belief.

Sources of Self-efficacy Beliefs

The case for the contextual and mediational role of self-efficacy in human behavior can be made by exploring the four sources from which these beliefs are developed. The most influential source of these beliefs is the interpreted result of one's purposive performance, or mastery experience. Simply put, individuals gauge the effects of their actions, and their interpretations of these effects help create their efficacy beliefs. Outcomes interpreted as successful raise self-efficacy; those interpreted as failures lower it. Bandura's (1986) emphasis that one's mastery experiences are the most influential source of self-efficacy information has important implications for the self-enhancement model of academic achievement, which contends that, to increase student achievement in school, educational efforts should focus on altering students' beliefs of their self-worth or competence. This is usually accomplished through programs that emphasize enhancing self-beliefs through verbal persuasion methods. Social cognitive theorists shift that emphasis and focus on a joint effort to raise competence and confidence primarily through successful experience with the performance at hand, through authentic mastery experiences. They argue that interventions should be designed accordingly.

The second source of efficacy information is the vicarious experience of the effects produced by the actions of others. This source of information is weaker than the interpreted results of mastery experiences, but, when people are uncertain about their own abilities or have limited prior experience, they become more sensitive to it. As Schunk (1981, 1983a, 1987) has demonstrated, the effects of models are particularly relevant in this context. A significant model in one's life can help instill self-beliefs that will influence the course and direction that life will take. Part of one's vicarious experience also involves the social comparisons made with other individuals. These comparisons, along with peer modeling, can be powerful influences on developing self-perceptions of competence (Schunk, 1983a). Interaction effects can complicate evaluation of the relative power of different modes of influence. For example, a model's failure has a more negative effect on the self-efficacy of observers when observers judge themselves as having comparable ability to the model. If, on the other hand, observers judge their capability as superior to the model's capability, failure of the model does not have a negative effect (Brown & Inouye, 1978).

Individuals also create and develop self-efficacy beliefs as a result of the verbal persuasions they receive from others. These persuasions involve exposure to the verbal judgments that others provide and is a weaker source of efficacy information than mastery or vicarious experiences, but persuaders can play an important part in the development of an individual's self-beliefs (Zeldin & Pajares, 1997). Effective persuasions should not be confused with knee-jerk praise or empty inspirational homilies (Bandura, 1997). This is consistent with Erikson's (1959/1980) caution that a weak ego is not strengthened by being persistently bolstered and that "children cannot be fooled by empty praise and condescending encouragement" (p. 95). Rather, "a strong ego, secured in its identity by a strong society, does not need, and in fact is immune to any attempt at artificial inflation" (p. 47). Persuaders must cultivate people's 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 defeat and weaken self-beliefs. In fact, it is usually easier to weaken self-efficacy

beliefs through negative appraisals than to strengthen such beliefs through positive encouragement (Bandura, 1986).

Physiological states such as anxiety, stress, arousal, fatigue, and mood states also provide information about efficacy beliefs. Because individuals have the capability to alter their own thinking, self-efficacy beliefs, in turn, also powerfully influence the physiological states themselves. Bandura (1997) has observed that people live with psychic environments that are primarily of their own making. It is often said that people can "read" themselves, and so this reading comes to be a realization of the thoughts and emotional states that individuals have themselves created. Often, they can gauge their confidence by the emotional state they experience as they contemplate an action. Moreover, when people experience aversive thoughts and fears about their capabilities, those negative affective reactions can themselves further lower perceptions of capability and trigger the stress and agitation that help ensure the inadequate performance they fear. This is not to say that the typical anxiety experienced before an important endeavor is a guide to low self-efficacy. Strong emotional reactions to a task, however, provide cues about the anticipated success or failure of the outcome.

It is important to restate that these sources of efficacy information are not directly translated into judgments of competence. Individuals interpret the results of events, and these interpretations provide the information on which judgments are based. The types of information people attend to and use to make efficacy judgments, and the rules they employ for weighting and integrating them, form the basis for such interpretations. Thus, the selection, integration, interpretation, and recollection of information influence judgments of self-efficacy.

Effects of Self-efficacy Beliefs

Self-efficacy beliefs influence motivational and self-regulatory processes in several ways. They influence the choices people make and the courses of action they pursue. Most people engage in tasks in which they feel competent and confident and avoid those in which they do not. William James (1892/1985) wrote that experience is essentially what individuals choose to attend to. If this is the case, then the self-beliefs that influence those choices are instrumental in defining one's experience and providing an avenue through which individuals exercise control over the events that affect their lives. Beliefs of personal competence also help determine how much effort people will expend on an activity, how long they will persevere when confronting obstacles, and how resilient they will prove in the face of adverse situations--the higher the sense of efficacy, the greater the effort, persistence, and resilience. Efficacy beliefs also influence the amount of stress and anxiety individuals experience as they engage in a task and the level of accomplishment they realize.

Strong self-efficacy beliefs enhance human accomplishment and personal well-being in many ways. People with a strong sense of personal competence in a domain approach difficult tasks in that domain as challenges to be mastered rather than as dangers to be avoided, have greater intrinsic interest in activities, set challenging goals and maintain a

strong commitment to them, heighten their efforts in the face of failure, more easily recover their confidence after failures or setbacks, and attribute failure to insufficient effort or deficient knowledge and skills which they believe they are capable of acquiring. High self-efficacy helps create feelings of serenity in approaching difficult tasks and activities. Conversely, people with low self-efficacy may believe that things are tougher than they really are, a belief that fosters stress, depression, and a narrow vision of how best to solve a problem. As a result of these influences, self-efficacy beliefs are strong determinants and predictors of the level of accomplishment that individuals finally attain. For these reasons, Bandura (1986, 1997) has made the strong claim that beliefs of personal efficacy constitute the key factor of human agency.

Self-efficacy and Outcome Expectations

Bandura (1978a, 1984, 1986) has drawn a distinction between the roles of self-efficacy beliefs versus those of outcome expectations in influencing motivation and predicting behavior. According to Bandura (1986), judgments of personal competence to engage in a behavior differ from "judgments of the likely consequence that behavior will produce" (p. 391). Efficacy beliefs in part determine outcome expectations. Individuals who expect success in a particular enterprise anticipate successful outcomes. Students confident in their academic skills expect high marks on exams and expect the quality of their work to reap benefits. The opposite is also true of those who lack such confidence. Students who doubt their academic ability envision low marks before they begin an exam. The expected results of these imagined performances will be differently envisioned: continued good grades and academic success for the former, curtailed possibilities and academic failure for the latter.

Bandura (1984) argued that the outcomes people expect are largely dependent on their judgments of what they can accomplish. As a consequence, outcome expectations should not make an independent contribution to predictions of behavior when self-efficacy perceptions are controlled. This is not to suggest that efficacy and outcome judgments are always consistent. Students may realize that strong mathematics skills are essential for a good score on the Graduate Record Examination (GRE) and admission to graduate school, which, in turn, may ensure a prestigious career and affluent lifestyle, but if they have low confidence in their math abilities they may shy away from certain courses and may not bother to take the GRE or apply to graduate school. High self-efficacy and negative outcome expectations are similarly possible. A student reasonably confident in her chemistry capabilities may elect not to enroll in a chemistry course because the professor's grading curve is such as to discourage all but the hardiest souls.

Some researchers have argued that the distinctions that Bandura (1978a) drew between self-efficacy beliefs and outcome expectations, as well as the roles he suggested they each play, are not entirely clear. Kirsch (1985) argued that Bandura used the term outcome expectations in two different ways. For example, knowledge of logical and immutable consequences, such as knowing that a good score on the GRE will result in graduate school admission, is a perceived environmental contingency, i.e., an outcome expectation beyond an individual's control. These outcome expectations are independent

of one's own self-perceptions of competence. This meaning, Kirsch argued, is at odds with Bandura's claim that outcome expectations primarily derive from judgments of how well one can execute requisite behaviors, and, only in this latter sense are outcomes dependent on performance and at the mercy of efficacy beliefs.

Actually, Bandura (1986, 1997) has attempted to draw a clear distinction between different forms of outcome expectations and has specified conditions under which outcome expectations are determined entirely, partial, or not at all by efficacy beliefs, as well as the sociostructural conditions determining the degree of relation between efficacy and expected outcomes. When the outcomes that result from specific performances are not themselves controlled by such performances, efficacy beliefs account for a smaller part of the variance in outcome expectations. In prejudicially structured systems, for example, outcomes can be highly independent of the performances in which individuals engage and of the outcomes that result from those performances. When individuals in excluded groups perceive that desired outcomes will not result from their efforts, no matter how hard they work, efficacy beliefs will result in little control over environments and will not be predictive of outcomes.

Some researchers contend that in many cases self-efficacy judgments are themselves dependent on outcome expectations and that Bandura (1978a) oversimplified the relationship between the two constructs (Eastman & Marzillier, 1984; Kazdin, 1978; Teasdale, 1978). To illustrate the potential complexity of this relationship, Marzillier and Eastman (1984) used the example of a socially anxious man who is asked to attend a party. The outcomes perceived by this individual are bleak indeed -- others at the gathering will ridicule him, he will be unable to talk to anyone, he will drink too much, and he will surely make a fool of himself. Marzillier and Eastman argued that these outcome expectations are as important in determining whether the man will attend the party as is his belief in whether he can cope with the demands of the occasion. They argued that individuals can infer their efficacy beliefs from such imagined outcomes, and they suggested that individuals' perceptions of an outcome and their value of the task necessary to achieve that outcome can regulate their behavior as powerfully as their self-efficacy beliefs, and even independent of them.

Bandura (1984) countered that "one cannot conjure up outcomes without giving thought to what one is doing and how well one is doing it" (p. 232). The socially anxious man confronted with the decision of whether to attend the party envisions disastrous outcomes largely because he has little confidence in his capabilities to meet the demands associated with parties. Foresightful action requires a causal ordering wherein causal thinking places the actions in which an individual engages before the outcomes that result from them. It is unlikely that our man, when faced with the decision of whether to attend the party, envisions the disastrous outcomes and concludes that he has little confidence in his party skills. Likewise, students do not envision low grades and academic difficulties and from this conclude that they have little confidence in their academic capabilities. More likely, lack of confidence to exercise control over a particular situation creates the envisioned outcomes. Students who lack confidence in their academic capabilities will likely envision the poor academic outcomes that will result from their low performance

attainments. It is also possible, Bandura argued, to exclude considerations of outcome from judgments of personal efficacy. For example, students are capable of assessing their academic capabilities quite apart from any outcomes they may envision. The differing roles played by beliefs of personal competence versus beliefs about likely outcomes continues to be an area of study, but various research studies aimed at clarifying this interplay support the contentions of social cognitive theory (see Bandura, 1997).

Self-efficacy and Other Expectancy Beliefs

Self-beliefs specific to one's perceived capability, or expectancy beliefs, are prominent in motivation research. Self-efficacy and other expectancy beliefs are similar in that they are each beliefs about one's perceived capability; they differ in that self-efficacy is defined in terms of individuals' perceived capabilities to attain designated types of performances and achieve specific results. 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 (Bandura, 1986, 1989; Pintrich & Schunk, 1995). Consequently, self-efficacy is generally assessed at a more microanalytic level than are other expectancy constructs, which, although they are typically domain-specific, form more global and general self-perceptions.

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 (Hackett & Betz, 1989), perform reading or writing tasks (Shell, Colvin, & Bruning, 1995), or engage in self-regulatory strategies (Bandura, 1989). Assessment of other expectancy beliefs include asking students to report how well they expect to do in an academic subject (e.g., performance expectancies -- Meece, Wigfield, & Eccles, 1990), whether they understand what they read (e.g., perceptions of competence -- Harter, 1982), or whether they are good in an academic subject (e.g., academic domain-specific self-concept -- Marsh, 1992; also ability perceptions, Meece et al., 1990).

Empirically, the issue centers around which types of questions, and the beliefs such questions tap, afford greater prediction and explanation of an individual's dispositions, behavioral intentions, and subsequent actions. This issue can more easily be clarified with studies that explore the confidence-performance relation at various levels of specificity and with varying degrees of correspondence. Conceptually, this is also an issue of which types of questions individuals primarily ask themselves as they encounter new information and novel phenomena, engage in tasks, and sort out just what it is that they will or will not do. This will require more perceptive investigations aimed at discovering what beliefs are triggered by varying environmental contingencies and how these beliefs act as self-regulating mechanisms of personal agency. It merits adding that the self-

efficacy construct is embedded in a theory of human social cognition, whereas most expectancy constructs that can presently be found in the literature offer few theoretical underpinnings or connections to broader theoretical tenets.

Problems in Research on Expectancy Constructs

As outlined above, the role that self-beliefs play in human motivation and behavior is the primary focus of theoretical perspectives other than those of social cognitive theory. To better understand the role that expectancy beliefs play in academic settings, researchers have investigated the relationship between these beliefs and various academic performances as well as that among the beliefs themselves. Numerous findings support the contentions of social cognitive theorists as regards the role of self-efficacy (see Multon et al., 1991), but they also support the contentions of other expectancy theorists. It is, of course, in keeping with the predictive nature of normal science that most theoretical contentions receive support when only significant results tend to make the transition from analysis to publication (Kuhn, 1970).

Findings have been less successful in clarifying the nature of the relationship between self-efficacy beliefs and other expectancy constructs, in demonstrating either the empirical or practical difference between them (Bong, 1996), or in determining clear differences in their varying contributions to the prediction of academic performances or self-regulatory practices. Also, because beliefs about one's perceived competence are subsumed into the conceptual and operational definitions of other motivation constructs, results often produce confounded relationships and ambiguous findings that obfuscate the potential contribution of any expectancy belief to the understanding of academic motivation. Problems have centered on two areas: inappropriate assessments of self-efficacy beliefs (Pajares, 1996c; Zimmerman, 1996) and the field's general inability to distinguish between the numerous expectancy constructs, either empirically or theoretically (Bong, 1996; Graham & Weiner, 1996).

Assessing Self-efficacy Beliefs

Problems related to assessment have plagued self-efficacy research (see Zimmerman, 1996). Bandura (1997) has cautioned researchers attempting to predict academic outcomes from students' self-efficacy beliefs that, to increase accuracy of prediction, "self-efficacy beliefs should be measured in terms of particularized judgments of capability that may vary across realms of activity, different levels of task demands within a given activity domain, and under different situational circumstances" (p. 6). Additionally, efficacy beliefs should be assessed at the optimal level of specificity that corresponds to the criterial task being assessed and the domain of functioning being analyzed. These cautions have often gone unheeded in educational research, resulting in self-efficacy assessments that reflect global or generalized attitudes about capabilities bearing slight or no resemblance to the criterial task with which they are compared. Often, no criterial task is identified, as researchers aim to discover simply the nature of the interplay among motivation variables in the absence of performance attainments. In

still other studies, judgments of confidence that bear passing resemblance to self-efficacy beliefs are used instead of more appropriate particularized measures.

Efficacy beliefs vary in level, strength, and generality, and these dimensions prove important in determining appropriate measurement. Imagine that a researcher is interested in assessing the essay-writing self-efficacy of middle-school students. First, there are different levels of task demands within any given domain that researchers may tap. In this case, these can range from the lower level of writing a simple sentence with proper punctuation and grammatical structure to the higher level of writing a compound and complex sentences with proper punctuation and grammatical structure or organizing sentences into a paragraph so as to clearly express a theme or idea. Students are then asked to rate the strength of their belief in their capability to perform the various levels identified. If researchers have adequately identified the relevant levels of writing an essay at this academic juncture, the efficacy assessment provides multiple specific items of varying difficulty that collectively assesses the domain of essay-writing. In addition, the items in this case should be prototypic of essay-writing at the middle-school level rather than minutely specific features of writing (e.g., confidence to form letters). Also, items should be worded in terms of <u>can</u>, a judgment of capability, rather than of <u>will</u>, a statement of intention

Because the students' beliefs will differ in generality across the domain of writing, if these beliefs are to be compared with students' actual writing, the researcher's next task is to select a writing task on which the levels were based and on which the confidence judgments were provided -- in other words, an essay (rather than a poem or a creative short-story or the yearly grade in language arts). Students may not judge themselves efficacious across all types of language arts activities or even across all types of writing. Self-efficacy beliefs will differ in predictive power depending on the task they are asked to predict. In general, efficacy beliefs will best predict the performances that most closely correspond with such beliefs. Thus, understanding that beliefs differ in generality is crucial to understanding efficacy assessment.

The most general self-efficacy assessments consist of an omnibus-type instrument that attempts to measure a general sense of efficacy or "confidence." Bandura (1986, 1997) argued that such general measures create problems of predictive relevance and are obscure about just what is being assessed. General self-efficacy instruments provide global scores that decontextualize the self-efficacy/behavior correspondence and transform self-efficacy into a generalized personality trait rather than the context-specific judgment Bandura suggests it is. In essence, these instruments assess people's general confidence that they can succeed at tasks and in situations without specifying what these tasks or situations are. Even domain-specific measures are problematic if composite multiscale scores drawn from differing subsections of the domain are used. Composite scores provided by multiple-scale instruments may have limited value if one wishes to predict discrete academic outcomes (see Pajares & Miller, 1995).

Various researchers have assessed general academic self-perceptions of competence (see the meta-analysis of Multon et al., 1991). The problem with such assessments is that

students must make judgments about their academic capabilities without a clear activity or task in mind. As a result, they generate the judgments by in some fashion mentally aggregating related perceptions that they hope will be related to imagined tasks. Domain-specific assessments, such as asking students to provide their confidence to learn mathematics or writing, are more explanatory and predictive than omnibus measures and preferable to general academic judgments, but they are inferior to task-specific judgments because the subdomains can differ markedly in the skills required.

Academic domain-specific assessments of self-efficacy are especially common in educational research in part because the criterial outcome tasks such as semester grades or achievement test results that are often used do not lend themselves to particularized self-efficacy assessment. The typical strategy of researchers in this regard is to use multiple items to restate different facets (or even similar facets differently phrased) of the same academic subject. It is not unusual for a mathematics self-efficacy scale to be populated with items such as "I am confident about my ability to do the work in this class"; "I am certain I can understand the math presented in this class"; and "I am confident I can perform as well or better than others in this class." Although high internal consistency is ensured, such assessments primarily provide a redundant measure of the general domain.

Bandura (1982, 1986) argued that reasonably precise judgments of capability matched to a specific outcome afford the greatest prediction and offer the best explanations of behavioral outcomes because these are the sorts of judgments that individuals call on when confronted with behavioral tasks. This is an especially critical issue in studies that attempt to establish causal relations between beliefs and outcomes. All this is to say that capabilities assessed and capabilities tested should be similar capabilities. Because self-efficacy assessments often lack the specificity of measurement and consistency with the criterial task that optimizes the predictive power of self-efficacy beliefs, results minimize the influence of self-efficacy (see Bandura, 1986, 1986; Pajares, 1996a, 1996c; Pajares & Miller, 1995; Zimmerman, 1996).

Lent and Hackett (1987) rightly observed that specificity and precision can be purchased at the expense of external validity and practical relevance. Bandura (1997) argued that "efficacy beliefs are multifaceted and contextual, but the level of generality of the efficacy items within a given domain of functioning varies depending on the degree of situational resemblance and foreseeability of task demands" (p. 13). Judgments of competence need not be so microscopically operationalized that their assessment loses all sense of practical utility. Domain specificity should not be misconstrued as extreme situational specificity, and there is no need to reduce efficacy assessments to atomistic proportions. Lent et al. (1993) showed how efficacy judgments can be tailored to varying levels of academic outcomes and still remain highly predictive. They compared students' confidence to succeed in math-related courses with three career-related outcomes -- intention to take the courses listed on the instrument, grades obtained in math-related courses that students took during the subsequent term, and interest in the math courses listed on the instrument. Self-efficacy beliefs were predictive on each account.

In general, the research question of interest will dictate the desirable level of self-efficacy assessment. In many cases, intermediate levels of specificity provide the appropriate balance between rigor and relevance (Lent et al., 1986; Taylor & Betz, 1983). But there is no index against which to gauge the appropriateness and accuracy of a particular measure used to assess self-efficacy judgments. And, although it can be argued that correspondence between belief and performance is critical in studies that attempt to establish an empirical connection between the two, requirements of specificity will differ depending on the substantive question of interest and the nature of the variables with which self-efficacy beliefs will be compared. To be both explanatory and predictive, self-efficacy measures should be tailored to domain(s) of functioning being analyzed and reflect the various task demands within that domain. In the final analysis, evaluating the appropriateness and adequacy of a self-efficacy measure will require making a theoretically-informed and empirically sound judgment that reflects an understanding of the domain under investigation and its different features, of the types of capabilities the domain requires, and of the range of situations in which these capabilities might be applied. These understandings can then be used to evaluate an efficacy measure by the level of specificity of its items and the range of task demands that it includes (Bandura, 1997).

Inability to Distinguish Among a Proliferation of Expectancy Constructs

A second reason for the lack of clarity regarding the relationship between, and the differing effects of, self-efficacy and other expectancy beliefs has to do with the proliferation of expectancy constructs and the similarity of their conceptualizations (see Bong, 1996). Expectancy constructs that can be found in the literature include task-specific self-concept, self-concept of ability, expectancies, expectancy beliefs, expectancy for success, performance expectancies, perceptions of competence, perceptions of task difficulty, self-perceptions of ability, ability perceptions, perceived ability, self-appraisals of ability, perceived control, subjective competence, and, of course, confidence. There is no reason why theorists should conceptualize expectancy beliefs in identical fashion or agree, without empirical evidence, that one construct is superior to others. It may be that one conceptualization and definition best explains the role that these judgments play in human motivation and behavior. Consequently, the process of normal science requires that differing conceptualizations be subjected to empirical investigation so that the most useful and explanatory one may emerge and others are "read out" of the discipline. Alternatively, it may be that differing judgments can be found to play differing roles, and so different expectancy constructs may well provide different insights.

Such progress in the evolution of construct and theory might occur if theorists were better able to distinguish among the expectancy beliefs currently in use. That is not the case, however. Typically, most are defined in nearly identical fashion. Compare Boekaerts' (1991) definition of subjective competence as "a person's knowledge, beliefs, and feelings about his capabilities and skills" (p. 2) with Byrne's (1984) definition of self-concept as the self-perceptions that individuals have about their academic abilities, specifically, their "feelings and knowledge about [these] abilities [and] skills" (p. 428).

Moreover, expectancy constructs are assessed with questions that, although similar, are just different enough to make comparing findings a formidable task. Contrast a <u>perceived ability</u> item, "I can do well on this exam," (Green & Miller, 1996) with one from math <u>ability perceptions</u>, "How have you been doing in math this year," (Meece et al. 1990) or one from <u>self-appraisal of ability</u>, "How do you rate yourself in school ability compared with those in your grade at school?" (Felson, 1984). When these similarly conceptualized but differently operationalized self-perceptions of competence are differently used to suit specific research agendas, researchers are left with the imposing task of sifting through expectancy constructs, determining their "decisive characteristics" (Bong, 1996), evaluating whether findings are consistent or inconsistent with theoretical tenets and prior research, and planning follow-up investigations. Problems are compounded when researchers identify inaccurately defined and used assessments of competence as "self-efficacy" perceptions.

Consider also the confusion that centers around self-efficacy and self-concept[*1*](or self-esteem) beliefs. As is the case with self-efficacy and other expectancy constructs, the conceptual difference between self-efficacy and self-concept is not always clear to researchers or in investigations. Some researchers use the terms synonymously (Reyes, 1984); others describe self-concept as a generalized form of self-efficacy (Harter, 1990); still others define academic self-concept as self-perceptions of ability and suggest that one reason why these self-percepts affect performance is because of their effect on students' effort, persistence, and anxiety (Felson, 1984). Eccles, Adler, and Meece (1984), in an overview of self-concept theories, wrote about a self-concept <u>of ability</u> that affects "a variety of achievement behaviors including academic performance, task persistence, and task choice; people with positive perceptions of their ability approach achievement tasks with confidence and high expectations for success and, consequently, perform better on these tasks" (p. 27).

The two constructs differ primarily in that self-efficacy is a context-specific assessment of competence to perform a specific task, "an individual's judgment of his or her capabilities to perform given actions" (Schunk, 1991, p. 207). Self-concept is measured at a more general level of specificity and includes the evaluation of such competence and the feelings of self-worth associated with the behaviors in question. Self-concept judgments can be domain-specific but are not task-specific. Compared to self-efficacy judgments, they are more general and less sensitive to context. The typical self-concept item "I am quite good at mathematics" (Marsh, 1992) differs from a self-efficacy question that may begin with "How confident are you that you can successfully . . . " Moreover, self-efficacy and self-concept need not be related. A student may feel highly efficacious in mathematics but without the corresponding positive feelings of self-worth, in part because she may take no pride in accomplishments in this area.

Marsh, Walker, and Debus (1991) saw the distinction between the two constructs as a difference in the source of an individual's judgment. Self-concept judgments, they argued, are based on social- and self-comparisons, which they described as "frame of reference effects." Individuals use external and internal comparisons to determine their self-worth. By comparing one's own performance with those of others ("I am a better

math student than most of my friends") and also one's own performance in related areas ("I am better at math than at English"), an individual develops a judgment of self-worth -- a self-concept. Self-efficacy judgments, on the other hand, focus on the specific ability to accomplish the criterial task; hence, frame of reference effects do not play a prominent role. This is an arguable basis for a distinction, given that judgments of personal competence are also influenced by such comparisons (Bandura, 1986) and that social comparative information is critical to the development of self-efficacy beliefs (Schunk, 19983a). Models, for example, provide just the sort of external efficacy information that helps create a frame of reference (Schunk, 1981, 1987).

Because self-perceptions of competence are considered integral components of an individual's self-concept (see Shavelson & Bolus, 1982), self-efficacy beliefs are often viewed simply as requisite judgments necessary to the creation of self-concept beliefs. Rosenberg and Kapland (1982) wrote that self-concept percepts include judgments of confidence, along with judgments of self-esteem, stability, and self-crystallization. Self-concept theorists view as particularly troubling the loss in practical utility that results from the microanalytic assessment of a particularized judgment matched directly to a criterial task. Most academic outcomes are seldom as particularized as one's capability to solve specific problems or successfully accomplish specific tasks, the levels of specificity at which self-efficacy judgments are most predictive of academic performances.

Findings have consistently shown that academic domain-specific self-concept is related to academic achievement and to other motivation constructs across domains (see Hattie, 1992). Few researchers have explored the relationships among self-efficacy, self-concept, and academic performances, and results are inconsistent. Marsh et al. (1991) compared the direct effect of achievement on the math self-concept and self-efficacy of fifth graders and reported a stronger direct effect on self-concept than on self-efficacy. Chapman and Tunmer (1995) found that the reading performance of beginning readers during their first year of schooling had a stronger effect on their subsequent self-efficacy than on their reading self-concept. Such hypothesized relationships beg the question of which self belief has the stronger influence on achievement. Relich (1983), cited in Marsh (1990), assessed math self-concept, math achievement, performance on a mathematics task, and self-efficacy for the task. Achievement correlated equally strongly with domain-specific self-efficacy and self-concept. Specific performance on the math task was more strongly correlated with specifically assessed self-efficacy than with domain-specific self-concept. Pajares and Miller (1994) used path analysis and found that item-specific math self-efficacy beliefs were more predictive of a mathematics problem-solving than were domain-specific self-concept beliefs. Mone, Baker, and Jeffries (1995) also reported that self-efficacy had greater predictive validity for academic performance than did self-esteem.

The empirical focus of this argument again centers on the questions of which self-belief provides the greater explanation and prediction of behavior; the conceptual focus centers on which beliefs individuals attend to as they go about the business of day to day living. As is the case with other expectancy constructs, it is likely that different situations call forth different self-beliefs. When individuals are familiar with task demands, they may

call on the task-specific self-efficacy beliefs that closely correspond to the required performance. When task demands are unfamiliar, people must generalize from prior attainments that are perceived as similar to the required task and gauge their perceived competence with self-beliefs they judge more closely correspond to the novel requirements. To account for this, self-efficacy researchers have drawn a distinction between self-efficacy for performance and self-efficacy for learning (Zimmerman et al., 1992; Schunk, 1989, 1996b; Schunk, Hanson, & Cox, 1987). When students are familiar with the skills required to accomplish an academic task, they can interpret their prior attainments and identify the skills on which to formulate their self-efficacy for performance. At this level, specificity of self-belief and correspondence with task works with familiarity to maximize prediction of performance. When students are unfamiliar with the specific tasks that confront them, judgments of competence cannot be based on perceived skills related to the tasks, for students are not clear on which skills will be required. If the task is novel, the student may have no task skills to assess. At this level, task-specific self-efficacy beliefs are either lacking or must be inferred from past attainments in situations perceived as similar to the new one. In these cases, self-efficacy for performance is predictive to the degree that self-regulatory skills and strategies have generalized to the novel task. Students' domain-specific judgments of their capability that they can learn the material required in the domain in question, on the other hand, have been directly informed by factors such as confidence in one's self-regulatory strategies and relates positively to performance and to subsequent skill and self-efficacy assessments (Schunk, 1996b)

It should be emphasized, however, that individuals create and develop their self-efficacy beliefs from varied sources. Self-perceptions of previous attainments, and the resulting skills that are acquired, are but one source. Moreover, self-efficacy beliefs generalize across the self-system and can inform the execution of novel tasks. In fact, most experimental tests of self-efficacy's causality employ novel tasks. Bouffard-Bouchard (1990), for example, experimentally induced high or low self-efficacy in college students by providing positive or negative feedback and found that students whose self-efficacy had been raised used more efficient problem-solving strategies on a novel task and outperformed students whose self-efficacy had been lowered.

At the domain-specific or self-efficacy for learning levels of generality, self-concept and self-efficacy beliefs may be empirically similar. Skaalvik and Rankin (1996) subjected self-concept items and domain-specific self-efficacy items to confirmatory factor analysis and discovered that they loaded on the same factor, leading them to conjecture that the two may be different measures of the same construct. When they subjected problem-specific self-efficacy items and domain-specific self-concept items to factor analysis, two distinct factors emerged, but a second order common factor that explained 81% of the variance underlay the measures (also see Bandalos, Yates, & Thorndike-Christ 1995). These findings led them to suggest that "the traditional distinction between self-concept and self-efficacy may have been overstated in the literature" (p. 8). Social cognitive theorists propose that self-concept and self-efficacy act as common mechanisms of personal agency in the sense that both types of self-beliefs help mediate the influence of

other determinants on subsequent behavior and that both "contribute in their own way to the quality of human life" (Bandura, 1986, p. 410).

In general, the sensitivity to context and specificity afforded by self-efficacy assessments have resulted in findings that point toward the superiority of self-efficacy beliefs over more domain-specific perceptions of competence or self-concept beliefs as predictors of related academic outcomes (see Mone, 1995). As Graham and Weiner (1995) observed,

what cannot be disputed is Bandura's argument that self-efficacy has been a much more consistent predictor of behavior and behavior change than ha[ve] . . . any of the other closely related expectancy variables. Efficacy beliefs have been related to the acquisition of new skills and to the performance of previously learned skills at a level of specificity not found in any of the other motivation conceptions that include an expectancy construct. (p. 75)

Relation of Self-efficacy to Motivation Constructs and Academic Performances

Research findings over the past 20 years have generally supported Bandura's (1986) contention that efficacy beliefs mediate the effect of skills or other self-beliefs on subsequent performance attainments (see Bandura, 1997; Schunk, 1991). Researchers have also demonstrated that self-efficacy beliefs influence these attainments by influencing effort, persistence, and perseverance (Bandura & Schunk, 1981; Bouffard-Bouchard, 1990; Schunk & Hanson, 1985). For example, Collins (1982) 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 new problems to solve and an opportunity to rework those they missed. Collins reported that ability was related to performance but that, regardless of ability level, children with high self-efficacy completed more problems correctly and reworked more of the ones they missed. Bouffard-Bouchard, Parent, and Larivèe (1991) found that students with high self-efficacy engaged in more effective self-regulatory strategies at each level of ability. Self-efficacy also enhances students' memory performance by enhancing persistence (Berry, 1987). In studies of college students who pursue science and engineering courses, high self-efficacy has been demonstrated to influence the academic persistence necessary to maintain high academic achievement (Lent, Brown, & Larkin, 1984, 1986).

Zimmerman and his associates have been instrumental in tracing the relationships among self-efficacy perceptions, self-efficacy for self-regulation, academic self-regulatory processes, and academic achievement (Bandura, 1991; Bandura & Jourden, 1991; Risemberg & Zimmerman, 1992; Zimmerman, 1989, 1990, 1994, 1995; Zimmerman & Bandura, 1994; Zimmerman & Martinez-Pons, 1990; Zimmerman & Ringle, 1981). This line of inquiry has successfully demonstrated that self-regulatory efficacy contributes to academic efficacy. For example, Zimmerman, Bandura, and Martinez-Pons (1992) used path analysis to demonstrate that academic self-efficacy mediated the influence of self-efficacy for self-regulated learning on academic achievement. Academic self-efficacy influenced achievement directly (= .21) as well as indirectly by raising students' grade

goals (= .36) (and see Wood & Locke, 1987). Other researchers have found that self-efficacy is related to self-regulated learning variables (e.g., Feather, 1988; Fincham & Cain, 1986; Paris & Oka, 1986; Pintrich & Schrauben, 1992; Pokay & Blumenfeld; 1990; Schunk, 1982b, 1985). Findings in this area suggest that students who believe they are capable of performing academic tasks use more cognitive and metacognitive strategies and persist longer than those who do not (see Pintrich & Garcia, 1991). Pintrich and De Groot (1990) reported a correlation between academic self-efficacy and both cognitive strategy use and self-regulation through use of metacognitive strategies. Academic self-efficacy also correlated with semester and final year grades, in-class seatwork and homework, exams and quizzes, and essays and reports. Pintrich and De Groot concluded that self-efficacy played a "facilitative" role in the process of cognitive engagement, that raising self-efficacy beliefs might lead to increased use of cognitive strategies and, thereby, higher performance, and that "students need to have both the 'will' and the 'skill' to be successful in classrooms" (p. 38).

Some researchers have assessed judgments of self-efficacy in terms of particularized self-perceptions of competence highly consistent with the criterial task being assessed. This assessment requires that, if the criterial task involves solving specific mathematics problems, the efficacy assessment asks students to provide judgments of confidence to solve similar problems, (see Pajares, Schunk, and their colleagues); if the task involves reading comprehension, students are asked to provide judgments of their perceived capability to correctly answer various questions that tap comprehension of the main ideas in a passage (Schunk & Rice, 1993; Shell, Murphy, & Bruning, 1989); if the task involves writing an essay, students are asked to provide judgments that they possess the various composition, grammar, usage, and mechanical skills on which their writing performance is assessed (Pajares & Johnson, 1994, 1996; Pajares & Valiante, 1997, in press; Shell et al., 1989, 1995).

Schunk and his colleagues have reported on numerous studies that have examined the role of particularized self-efficacy beliefs in various academic contexts (Schunk, 1982b, 1983b, 1984b, 1984c, 1985, 1987, 1994, 1996a, 1996b; Schunk & Cox, 1986; Schunk & Gunn, 1985; Schunk & Hanson, 1985, 1988). For example, Schunk (1981) used path analysis to show that modeling treatments increased persistence and accuracy on division problems by raising children's self-efficacy beliefs, which had a direct effect on skill (also see Zimmerman & Ringle, 1981). He later showed that effort attributional feedback of prior performance (e.g., "You've been working hard") raised the self-efficacy expectations of elementary school children, and this increase was, in part, responsible for increased skill in performance of subtraction problems (Schunk, 1982a). In subsequent experiments, he found that ability feedback (e.g., "You're good at this") had a stronger effect on self-efficacy and performance (Schunk, 1983a; Schunk & Gunn, 1986). Relich, Debus, and Walker (1986) also reported that self-efficacy mediated the role of skill training and attributional feedback and had a direct effect on the performance of division problems of learned helpless sixth graders. Attributional feedback showed a moderate direct effect on performance and a stronger indirect effect mediated by self-efficacy. In another study, Schunk (1984a) reported that mathematics self-efficacy influenced math performance both directly (= .46) and indirectly through persistence (= .30). Results of

these investigations demonstrate that acquisition of cognitive skills, modeling effects, attributional feedback, and goal setting influence the development of self-efficacy beliefs and that these beliefs, in turn, influence academic performances. Students with similar previous performance attainments and cognitive skills may differ in subsequent performance as a result of differing self-efficacy perceptions because these perceptions mediate between prior attainments and academic performances. As a consequence, such performances are generally better predicted by self-efficacy than by the prior attainments. Schunk (1991) suggested that variables such as perceived control, outcome expectations, perceived value of outcomes, attributions, goals, and self-concept may provide a "type of cue" used by individuals to assess their efficacy beliefs.

Other researchers have attempted to discover whether prediction is increased when particularized efficacy and performance assessments directly correspond. Pajares and Miller (1994) reported that math self-efficacy had stronger direct effects on mathematics problem-solving (= .545) than did self-concept, perceived usefulness, or prior experience. Self-efficacy mediated the effects of sex and prior experience on self-concept, perceived usefulness, and problem-solving performance. Pajares and Johnson (1996) investigated the influence of writing self-efficacy, writing self-concept, and writing apprehension on high school students' essay-writing, using a path model that controlled for the effects of sex and previously assessed writing aptitude. They reported that students' self-efficacy perceptions had a direct effect on their writing performance (= .395) and played the mediational role hypothesized by social cognitive theory. Pajares and Valiante (1997, in press) reported similar direct effects and similar relationships with third, four, and fifth grade students. Although writing apprehension and performance were correlated in both studies, results showed that the influence of apprehension on performance was largely a result of noncausal covariation with self-efficacy (also see McCarthy, Meier, & Rinderer, 1985; Meier, McCarthy, & Schmeck, 1984; Pajares & Johnson, 1994).

Pajares and Kranzler (1994, 1995a, 1995b) constructed path models that included math self-efficacy, general mental ability, math self-concept, math anxiety, self-efficacy for self-regulation, previous grades in mathematics, and sex. The most substantive effort to extend previous findings involved the inclusion in the model of a measure of general mental ability, or psychometric g, rather than a math-related aptitude assessment. The researchers chose an assessment of psychometric g because domain-related aptitude assessments as controls in studies of self-efficacy are confounded with the influence of self-beliefs that influence these assessments (Bandura, 1997; Dew, Galassi, & Galassi, 1984; Hackett & Betz, 1989). As a consequence, if the prior influence of the self-beliefs is not partialed out, their effect is artificially lessened. Moreover, g accounts for the single largest component underlying individual differences in mental ability (see Carroll, 1993) and is acknowledged a strong predictor of academic performances (Jensen, 1987; Thorndike, 1986). The key finding from these studies was that the direct effect of self-efficacy on performance (= 349) was as strong as was the effect of general mental ability (= 324). The nonsignificant direct effect of anxiety (Pajares & Kranzler, 1995b) and the reduced effect of self-concept (Pajares & Kranzler, 1994, 1995a) on performance, as well as the influence of self-efficacy on anxiety and self-concept, supported previous findings

that the influence of these determinants on academic performances diminishes when particularized assessments of self-efficacy are included in a model.

Pajares (1996b) examined the interplay between self-efficacy judgments and the mathematical problem-solving of middle school students mainstreamed in algebra classes. Math self-efficacy made an independent contribution to the problem-solving performance of regular education students (= .387) and of gifted students (= .455) in a path model that controlled for the effects of math anxiety, cognitive ability, mathematics grades, self-efficacy for self-regulatory learning, and sex. Pajares also reported that girls expressed lower confidence when performance scores did not warrant it and similar confidence when performance scores warranted greater confidence. Although most students were biased toward overconfidence, girls were less biased in that direction, and gifted girls were biased toward underconfidence. Consistent with the findings of Hackett, Meece, and their colleagues, these results suggest that factors are still at work in negatively affecting some mathematics self-beliefs of girls.

What this line of inquiry has demonstrated is that, when self-efficacy beliefs closely correspond to the criterial task with which they are compared, prediction is enhanced. Multon et al. (1991) found 36 studies written between 1977 and 1988 on the relationship between self-efficacy and academic performance or persistence that met their criteria for inclusion in a meta-analysis: containing a measure of self-efficacy and academic performance and providing sufficient information to calculate effect size estimates. They computed that efficacy beliefs were related to performance (r_u = .38) and accounted for approximately 14% of the variance in academic performance. However, effect sizes depended on specific characteristics of the studies, notably on the types of efficacy and performance measures used. The strongest effects were obtained by researchers who compared specific efficacy judgments with basic cognitive skills measures of performance (.52 versus .36 for performance in course work and .13 for standardized tests), developed highly concordant self-efficacy/performance indices, and administered them at the same time.

Zero-order correlations between self-efficacy and academic performances in investigations in which self-efficacy is analyzed at the item- or task-specific level and closely corresponds to the criterial task have ranged from $\underline{r}$ = .49 to .70; direct effects in path analytic studies have ranged from $\underline{B}$ = .349 to .545. Results tend to be higher in studies of mathematics than of other academic areas such as reading or writing, but even in these areas relationships are considerably higher than previously obtained if the criteria by which students rate their self-efficacy judgments is used as the criteria for scoring essays or assessing reading comprehension.

As noted by Multon et al. (1991), self-efficacy researchers have sometimes used generalized, global, or multiple-scale self-efficacy measures to predict academic performances. For example, researchers have often operationalized math self-efficacy as the composite score of individuals' judgments of their capabilities to solve math problems, perform math-related tasks, and succeed in math-related courses -- the three subscales of the Mathematics Self-Efficacy Scale (MSES) (Betz & Hackett, 1983).

Randhawa, Beamer, and Lundberg (1993) adapted the MSES for use with high school students and used LISREL procedures to find that the composite self-efficacy score mediated the effect of a generalized math attitude score on math problem-solving. The criterial task used by the researchers--the solving of mathematics problems--was conceptually related only to the problems subscale of the MSES. Many of the problems on the self-efficacy assessment also differed markedly from those on the performance test. Consequently, although generalized mathematics attitudes had a strong direct effect on self-efficacy ($\underline{B}$ = .64), they also had as strong a direct effect on performance ($\underline{B}$ = .44) as did self-efficacy ($\underline{B}$ = .32).

The mathematics judgments assessed by the different subscales of the MSES are substantively different and tap differing math-related beliefs. Although all are math-related, their predictive value should depend on the nature of the criterial tasks with which they are compared. Consequently, students' judgments to solve math problems should be more strongly predictive of their capability to solve those problems than should their confidence to perform other math-related tasks or succeed in math-related courses. Similarly, their judgments to succeed in math-related courses should be more strongly predictive of their choice to enroll in such courses than should their confidence to solve specific problems or perform math-related tasks. Pajares and Miller (1995) compared these judgments of capability with two outcome measures: ability to solve the problems on which self-efficacy was assessed and math-relatedness of academic majors. Results confirmed that Bandura's (1986) cautions regarding specificity of self-efficacy and performance assessment are well founded. Students' confidence to solve mathematics problems was a more powerful predictor of their ability to solve those problems than was their confidence to perform math-related tasks or their confidence to earn A's or B's in math-related courses. Similarly, their confidence to succeed in such courses was more predictive of their choice of majors that required them to take many of the math-related courses on which they expressed that confidence.

Recall that significant relationships are obtained even with generalized domain-specific self-perceptions, provided that they assess skills and performances in related domains (Multon et al., 1991). Pajares and Miller (1995) found this phenomenon as well. Each subscale, as well as the full-scale, correlated significantly with each performance task. Such relationships attest to the generalizability of self-efficacy perceptions within a domain, but prediction is enhanced as self-efficacy and performance more closely match. One might also question the practical utility of administering a 52-item instrument when greater prediction may be had from a shorter instrument more closely matching the performance task.

Studies that report a lack of relationship between self-efficacy and performance often suffer from problems either in domain specificity or correspondence. Benson (1989) found that the path from mathematics self-efficacy to performance was not significant. Self-efficacy was assessed with three global items that reflected a performance prediction in statistics class rather than a judgment of capability (e.g., "No matter how hard I study, I will not do well in this class"); performance was the midterm exam grade in a statistics course. Wilhite (1990) found that college students' self-assessment of memory ability was

the strongest predictor of their GPA, followed by locus of control. Self-efficacy showed a weak relationship. Efficacy judgments were assessed using a global self-concept measure. Smith, Arnkoff, and Wright (1990) tested the predictive power of three theoretical models on the academic performance of college undergraduates. The researchers concluded that, although variables within each model predicted performance to some degree, self-efficacy was a weak predictor. Self-efficacy was assessed as perceived study skills or test-taking capability and was measured with items such as "Rate how certain you are that you can study at a time and place where you won't get distracted." This was compared with academic performances such as exam grades and course GPA. Cooper and Robinson (1991) compared scores from the courses subscale of the MSES with scores on a performance measure that consisted of solving problems from the Missouri Mathematics Placement Test and reported a low but significant correlation between math self-efficacy and performance. A regression model with math anxiety, the quantitative score on the American College Test (ACT-Q), and prior math experience revealed that self-efficacy did not account for a significant portion of the variance in math performance.

Findings on self-efficacy coincide on two points: When efficacy beliefs are globally assessed and/or do not correspond with the criterial tasks with which they are compared, their predictive value is diminished or can even nullified; when efficacy assessments are tailored to the criterial task, prediction is enhanced. In general, there is ample reason to believe that self-efficacy is a powerful motivation construct that works well to predict academic self-beliefs and performances at varying levels but works best when theoretical guidelines and procedures regarding specificity and correspondence are adhered to.

Future Directions in Self-efficacy Research

Research on self-efficacy beliefs in academic settings is thriving (Graham & Weiner, 1996), and the empirical connection between self-efficacy and other motivation constructs, academic performances, and achievement has by now been reasonably secured. Having traced the road that self-efficacy research has traveled during these past 20 years and the problems it has encountered along the way, it may now be useful to draw on past results and theoretical insights in order to offer some suggestions that may guide subsequent research and practice. Hopefully, these suggestions will help self-efficacy theorists chart new directions and adopt research strategies that will provide practical, relevant, and theoretical insights.

Formulating Questions with an Eye to Specificity and Correspondence

A test of self-efficacy theory requires the type of assessment specified by the theory. When such tests are appropriately conducted, results from self-efficacy investigations have shown that, as Bandura (1986, 1997) theorized, particularized judgments of capability are better predictors of related performances than are more generalized judgments. Consequently, if the aim of a study is to increase prediction of academic performances or to help distinguish among self-efficacy and other expectancy or self-beliefs, research questions should be formulated with an eye to measuring self-efficacy as

specifically as is relevant and useful and also to enhancing the correspondence between self-efficacy and criterial variables.

The cautions of Lent and Hackett (1987) as regards the practical utility of overly specific assessments bear repeating, however. In an effort to achieve high specificity, it is possible to define a construct so narrowly that it loses any sense of relevance. Moreover, many criterial tasks of interest in the motivation and academic arenas cannot be assessed with the specificity afforded by a performance as particularized as the solution of, say, specific mathematics problems. Researchers are again cautioned that domain specificity should not be misconstrued as an extreme situational specificity that reduces efficacy assessment to an atomistic level. Also, Marsh, Roche, Pajares, and Miller (1996) have cautioned that using identical self-efficacy and performance indexes in an effort to closely match belief and criterion may lead to positively biased estimates of effects from self-efficacy to performance outcomes. Consequently, researchers are encouraged to use similar rather than identical items or tasks to assess self-efficacy belief and performance criteria or to use structural equation modeling analyses to sift out the bias that might result from correlated specifics. As earlier discussed, the research question of interest should dictate the appropriate level of self-efficacy assessment. It should be added that self-efficacy beliefs measured at various levels of specificity can prove useful outside the research arena as diagnostic and assessment tools -- they can provide teachers and counselors with information regarding students' dispositions, and results may be useful in helping to understand affective influences on performances that do not easily lend themselves to microanalytic analysis.

Discovering the Generality of Self-efficacy Beliefs

Bandura (1997) has identified several conditions under which judgments of competence can generalize across activities -, i.e., the extent to which they relate to, or transfer across, different performance tasks or domains. For example, when differing tasks require similar subskills, judgments of capability to demonstrate the requisite subskills should predict the differing outcomes. Generality can also take place when the skills required to accomplish dissimilar activities are acquired together. In school, students' mathematics and verbal self-efficacy may generalize if the skills for each subject have been adequately taught and developed by a competent teacher. Subskills required to organize a course of action are themselves governed by broader self-regulatory skills such as knowing how to diagnose task demands or constructing and evaluating alternative strategies. Possessing these self-regulatory skills can permit students to improve their performances across varied academic activities (see Zimmerman, 1989). Generalizable coping skills work in similar fashion by reducing stress and promoting effective functioning across varied domains. Self-efficacy should also generalize when commonalities are cognitively structured across activities. For instance, if students can be helped to realize that increased effort and persistence result in academic progress and greater understanding in mathematics, it is likely that similar connections may be made to other subject areas. Finally, there are "transforming experiences" that come about as the result of powerful performance attainments and serve to strengthen beliefs in diverse areas of one's life, areas often greatly unrelated. Many doctoral students will attest to the fact that successful

completion of a dissertation can dramatically alter their confidence to deal with activities and events unrelated to their scholarly pursuits.

The hypothesized conditions under which judgments of competence should generalize across varied activities and domains provide rich opportunity for empirical investigation that would help trace the genesis of self-beliefs as well as their possible interconnections (see Rokeach, 1960, 1968). These insights might also shed light on findings from cognitive psychology which demonstrate that students often have great difficulty transferring strategies and various types of knowledge across academic domains (e.g., Pressley et al., 1990). There is some evidence, however, that efficacy beliefs generalize along the lines that Bandura (1997) has suggested (see Schunk, 1991; Smith, 1989). It is possible, of course, that, although the use of strategies or knowledge functions may not so easily transfer, the beliefs that accompany these cognitive processes may more easily travel. That is to say, cognitive, knowledge-based components required to carry out an activity or task may make the voyage from one activity to another with greater difficulty than the belief components that provide the effort and persistence necessary to attack the related or novel activity. It will be interesting to discover to what degree the process of transferring beliefs resembles or differs from the process of transferring other cognitive processes.

Various researchers have noted the need to explore the generality of self-efficacy so as to increase its practical utility (Lent & Hackett, 1987; Multon et al., 1991). Results from such studies would inform theoretical contentions about the influence of self-efficacy on academic performances and about the relationship between self-efficacy and other motivation constructs. However, Bandura (1997) cautioned that empirical results verifying that efficacy beliefs generalize across domains should not result in the "pursuit of a psychological Grail of generality" (p. 24) that would seek to find root cause for varying self-beliefs. Similar cognitive subskills or strong self regulatory efficacy should aid performance in varied domains, but specific pursuits will usually differ in the specialized competencies they require. Moreover, with these cautions in mind, understanding the conditions and contexts under which self-beliefs will generalize to differing academic activities offers valuable possibilities for intervention and instructional strategies that may help students build both competence and the necessary accompanying self-perceptions of competence.

Understanding the Implications Related to Strength and Accuracy of Self-efficacy Beliefs

Bandura (1986) argued that successful functioning is best served by reasonably accurate efficacy appraisals, although the most functional efficacy judgments are those that slightly exceed what one can actually accomplish, for this overestimation serves to increase effort and persistence. Indeed, most students are overconfident about their academic capabilities (Hackett & Betz, 1989; Pajares, 1996c; Pajares & Miller, 1994, in press). But how much confidence is too much confidence, when can overconfidence be characterized as excessive and maladaptive in an academic enterprise, what factors help create inaccurate self-perceptions, and what are the likely effects of such inaccuracy? Bandura argued that the stronger the self-efficacy, the more likely are persons to select

challenging tasks, persist at them, and perform them successfully. Researchers will have to determine to what degree high self-efficacy demonstrated in the face of incongruent performance attainments ultimately results in these benefits. Efforts to lower students' efficacy percepts or interventions designed to raise already overconfident beliefs should be discouraged, but improving students' calibration -- the accuracy of their self-perceptions -- will require helping them to better understand what they know and do not know so that they may more effectively deploy appropriate cognitive strategies as they perform a task.

These issues of "accuracy," however, cannot easily be divorced from issues of well-being, optimism, and will. Research supports the notion that, as people evaluate their lives, they are more likely to regret the challenge not confronted, the contest not entered, the risk unrisked, and the road not taken as a result of underconfidence and self-doubt rather than the action taken as a result of overconfidence and optimism (Bandura, 1997). The challenge to educators on this account will be to make students more familiar with their own internal mental structures without lowering confidence, optimism, and drive.

Conversely, students who lack confidence in skills they possess are less likely to engage in tasks in which those skills are required, and they may more quickly give up in the face of difficulty. Some researchers have found that girls perform as capably as do boys in varied academic tasks but often report lower self-efficacy, particularly at higher academic levels (Pajares & Johnson, 1996; Pajares & Miller, 1994, 1995, in press). In one study, gifted girls were biased toward underconfidence, although most students are generally biased toward overconfidence (Pajares, 1996b).

However, political pollsters long ago discovered that poll results can be manipulated by the manner in which questions are asked. In psychology, different insights are provided by different questions, and so here too the manner in which a question is asked may be differently revealing. Pajares and Valiante (1997) detected no sex differences in the confidence ratings that students made relative to their confidence to accomplish varied tasks related to the process of writing an essay. Boys and girls gave themselves an average rating of 82 on a scale of 0 to 100 on which they were asked to express their confidence. Noddings has argued that boys and girls may well use a different "metric" when providing confidence judgments and that girls may perceive that their judgment represents more of a "promise" (Purkey, 1996). Indeed, although boys and girls did not differ in their reported confidence to accomplish the writing skills outlined on the efficacy measure, when asked to directly compare their writing capability with that of boys, girls expressed a greater degree of superiority in their writing relative to boys in their class or in their school. In other words, although girls did not award themselves higher numbers than did the boys when asked to provide ratings of their confidence to accomplish the specific writing skills called for on the efficacy measure, it was evident that girls considered themselves better writers than the boys. It seems clear that, if researchers are to continue to explore sex differences in self-beliefs, they will need to address that issue with assessments of self-belief that will provide these sorts of insights. The typical practice of determining sex differences using differences in scores on confidence judgments on tasks or domains will not reveal clearly the nature of social and

academic comparisons. One must not confuse differences (or lack of difference) on the metric of a self-efficacy scale as differences in confidence. More direct ability comparisons are called for.

Additional studies are required to discover the extent of these phenomena across academic areas and levels, and how differing beliefs are created and maintained in the face of similar ability and performance. Investigations are particularly needed at lower academic levels, especially those in which these sorts of self-beliefs begin to be created. Exploring the nature of the relationship between efficacy judgments, calibration, performance attainments, and the hypothesized effects of self-efficacy continues to be a promising avenue of inquiry.

Tracing the Sources and Effects of Self-efficacy Beliefs

In academic settings, self-efficacy researchers have sought to determine the predictive value of self-efficacy beliefs on other motivation constructs or on varied performances. In most cases, the statistical models with self-efficacy as a dependent variable have accounted for only a small portion of the variance. Future investigations might seek to identify sources of academic self-efficacy information other than those typically used -- aptitude, ability, previous achievement -- so as to trace the genesis and development of self-efficacy beliefs as well as determine how perceptions of efficacy mediate the influence of these sources on self-regulatory strategies, on other constructs, and on subsequent performances. As was noted earlier, self-efficacy theory identifies four main sources of self-efficacy beliefs -- mastery experience, vicarious experience, verbal persuasions, and physiological indices -- as well as major indicants within each source (for example, the role played by task difficulty in the interpretation of mastery experiences; the varying influence of the vicarious experience provided by different models; the differing influence of verbal persuasions depending on the degree of appraisal disparity between one's own self-efficacy and the verbals appraisals of others; the role of mood). Although a number of these have been explored and verified, others still need to be tested and greater insights developed. Researchers will also need to examine how information from these different sources are integrated in the formation of efficacy judgments.

With the exception of Schunk's (1981, 1982a, 1983a; Schunk & Hanson, 1985) exploration of the influence of attributional feedback, modeling effects, and goal setting on self-efficacy beliefs, little is known about how vicarious experiences and verbal persuasions affect the creation and development of academic self-efficacy beliefs. It would be especially useful to develop insights about how and why differing interpretations of similar attainments and from similar sources result in different beliefs, as well as how inaccurate self-perceptions are developed and why they can persist even in the face of subsequent successes and strong performance attainments.

Students cannot accomplish tasks beyond their capabilities simply by believing that they can. Rather, beliefs are, as Peirce (1878) observed, "rules for action" (cited in James, 1885/1975, p. 28). As such, beliefs become the internal rules individuals follow as they

determine the effort, persistence, and perseverance required to achieve optimally as well as the strategies they will use. Researchers have examined the influence of self-efficacy on these variables and reported significant relationships, but it is not entirely clear how these connections are made or under what conditions similar self-beliefs can result in different levels of motivation. Because of the survey nature of most investigations, effects are generally assessed in terms of students' self-reported effort and persistence rather than investigator-observed effort and persistence. This has also been the case with self-regulatory strategies, which have been typically self-reported by students rather than directly observed by investigators. Two strategies are called for. The first is for researchers to assess both the sources and the effects of self-efficacy through direct observation rather than rely on students' self-reports; the second is to increase the use of experimental techniques so as to manipulate sources and effects (e.g., Bouffard-Bouchard, 1990). Investigators should continue to look to motivation and self-regulatory variables as outcome measures and in real classroom contexts to better understand the relationship between self-efficacy beliefs and other self-beliefs and motivation constructs (see Ames, 1992). Quantitative efforts will have to be complemented by qualitative studies aimed at exploring how efficacy beliefs are developed, how students perceive that these beliefs influence their academic attainments and the academic paths that they follow, and how the beliefs influence choices, effort, persistence, perseverance, and resiliency.

Exploring the Causal Predominance of Self-efficacy

One of the thorniest problems to confront the study of self-beliefs is that of causal predominance and direction of causal predominance. This chicken-or-egg question has been an important focus of many self-concept studies (Hattie, 1992), and its implications are equally relevant to self-efficacy research. In self-concept research, the issue has been one of whether feeling good about oneself is primarily responsible for increased achievement or whether successful performance is largely responsible for stronger feelings of self-worth. Because of the reciprocal nature of human motivation and behavior, it is unlikely that such a question can be resolved (see Bandura, 1986; Eccles & Wigfield, 1985; Wigfield & Karpathian, 1991). It is possible, however, to develop better understandings of the conditions under which self-efficacy beliefs operate as causal factors in human functioning, through their influence on choice, effort, and persistence.

Marsh (1990) has warned about the limitations of causal models in nonexperimental investigations of self-constructs. Writing directly on the issue of causal ordering as regards self-concept beliefs and academic achievement, Marsh (1993) suggested that, if such questions are to be resolved, researchers will need to

(a) measure academic self-concept and academic achievement (school performance, standardized test scores, or preferably both) at least twice and preferably more frequently; (b) infer all latent constructs on the basis of multiple indicators; (c) consider a sufficiently large and diverse sample to justify the use of CGA and the generality of the findings, and (d) fit the data to a variety of CFA models that incorporate measurement error and test for likely residual covariation among measured variables. (p. 76)

Marsh's criteria are equally pertinent to self-efficacy research. Although causal modeling and path analytic techniques have proven useful in making causal inferences and testing theoretical tenets in nonexperimental studies, more experimental designs are required in which self-efficacy beliefs are altered and the effects of these changes on academic attainments or self-regulatory practices observed.

But as noted earlier, experimental designs in which self-efficacy is systematically raised to differential levels speak more directly to the issue of causality than those of multivariate relationships, and findings from investigations in which this has been accomplish suggest that self-efficacy beliefs make a causal contribution to the level and quality of human functioning (Bandura, 1997). In keeping with the hypothesized sources of efficacy information, beliefs can be altered using vicarious methods, verbal persuasions, differing performance feedback, social comparative information, and/or manipulating task complexity. Although the now typical procedure of testing multivariate relationships between domain-specific academic self-efficacy measures, other motivation constructs, and performance attainments in causal models is an improvement over less complex analyses, providing insights regarding the causal influence of self-beliefs will require experimental designs as well as longitudinal studies.

Refining the Study of Teacher Efficacy

Researchers have reported that teachers' beliefs of personal efficacy affect their instructional activities and their orientation toward the educational process. For example, preservice teachers' sense of teacher efficacy is related to their beliefs about controlling students. Teachers with a low sense of efficacy tend to hold a custodial orientation that takes a pessimistic view of students' motivation, emphasizes rigid control of classroom behavior, and relies on extrinsic inducements and negative sanctions to get students to study (Woolfolk & Hoy, 1990; Woolfolk, Rosoff, & Hoy, 1990). Teachers with high efficacy create mastery experiences for their students whereas teachers with low instructional efficacy undermine students's cognitive development as well as students' judgments of their own capabilities (Gibson & Dembo, 1984; Cohn & Rossmiller, 1987). Teacher efficacy also predicts student achievement and students' achievement beliefs across various areas and levels (Ashton & Webb, 1986; Midgley, Feldlaufer, & Eccles, 1989). There is need to discover additional correlates of teacher efficacy, as well as to understand how these beliefs influence educational outcome variables such as instructional practices or students' beliefs and achievement.

In most studies, teachers' sense of efficacy has primarily been assessed with two factors: sense of personal teaching efficacy and sense of teaching efficacy (Ashton & Webb, 1986; Gibson & Dembo, 1984). The first refers to individuals' assessment of their own teacher competence; the second refers to teachers' expectations that teaching can influence student learning. Guskey and Passaro (1994) reported that these two factors correspond not to a personal versus a general teaching efficacy orientation but instead to an internal versus external distinction similar to locus-of-control measures of attribution. If this is so, it would be instructive to discover what the two factors may actually be measuring. Moreover, teacher efficacy instruments typically ask teachers to express

confidence judgments on matters as disparate as classroom management and the influence of family background on student learning and then compare the composite score of these judgments with outcomes such as student achievement indices or varied teaching practices. If Bandura's (1986) cautions regarding correspondence of belief to criterial task are justified, such measures of teacher efficacy are insensitive to context and may minimize the actual influence of teachers' beliefs on instructional practices or student outcomes. Consistent with these guidelines, researchers in this area should endeavor to assess the teacher beliefs that correspond to the criteria of interest rather than assess those beliefs with a generalized measure and then make the connection with this assessment to specific practices or outcomes.

Teacher efficacy has become an important construct in teacher education, and teacher educators should continue to explore how teacher efficacy develops, what factors contribute to strong and positive teaching efficacy in varied domains, and how teacher education programs can help preservice teachers develop high teacher efficacy. Beliefs act as a filter through which new phenomena are interpreted and subsequent behavior mediated, but information can be filtered such that similar beliefs can have differing outcomes. For example, high teacher efficacy can promote or inhibit conceptual change (Guskey, 1986, 1989). That is, teachers highly confident in their instruction may be highly resistant to change any facet of it in large part because of the confidence they have in themselves; or, teachers highly confident in their instruction may also be confident enough in themselves to attempt conceptual change. It should prove insightful to discover how teachers make the connection between belief and action and under what conditions similar teacher efficacy beliefs can result in differing performances. Also, if beliefs are difficult to alter (Pajares, 1992), how can low teacher efficacy be raised? And, if efficacy beliefs are critical to the process of teaching, how can they be made an explicit focus of teacher education programs, and to what end?

Continuing Research on Self-efficacy and Career Choice

Results of various studies have demonstrated the mediational role of self-efficacy beliefs in the selection of career choice (see Hackett, 1995; Lent & Hackett, 1987, for reviews). In general, findings indicate that 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 reported that the mathematics self-efficacy of college undergraduates is more predictive of their mathematics interest and choice of math-related courses and majors than either their prior math achievement or math outcome expectations and that male undergraduates report higher mathematics self-efficacy than do female undergraduates (Hackett, 1985; Hackett & Betz, 1989; Lent, Lopez, & Bieschke, 1991, 1993; Pajares & Miller, 1994, 1995).

In many cases, young women avoid math-related courses and careers because they underestimate their capability rather than because they lack competence or skill. Hackett (1995) has elsewhere noted the key implications from these and similar findings and charted some future directions of career self-efficacy research, and they need not be

repeated here. It merits noting, however, that the most critical implication is that, given the situation in which many young women find themselves as a result of the lack of correspondence between their efficacy beliefs and performance attainments, enhancing these attainments alone will not correct the problem. Any such program or intervention will have to be accompanied by others designed to enhance academic <u>and</u> career-efficacy beliefs with focused attention on career development.

<u>Closing the Confidence Gap in Mathematics</u>

The relationship between gender and self-efficacy has not been explored as thoroughly as that between gender and academic performances. And, whereas recent findings suggest that gender differences in mathematics achievement are either diminishing or practically nonexistent (Eisenberg, Martin, & Fabes, 1996), some contemporary researchers have found that gender differences in the mathematics confidence of American students may still be prevalent (Betz & Hackett, 1983; Hackett, 1985; Lapan, Boggs, & Merrill, 1989; Lent et al., 1991; Matsui, Matsui, & Ohnishi, 1990; Pajares & Miller, 1994, in press; and see Wigfield, Eccles, & Pintrich, 1996). It seems that boys and girls report equal confidence in their math ability during the elementary years, but, by high school, boys are more confident and girls more likely to underestimate their capability (Eccles, 1983). Even by middle school, boys rate themselves more efficacious than do girls (Pintrich & De Groot, 1990; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). Gifted girls are especially likely to be biased toward underconfidence in mathematics (Pajares, 1996b). These findings are consistent with those from the United Kingdom, where men consistently expect better grades on university examinations than do women (Erkut, 1983; Vollmer, 1984, 1986a, 1986b).

Students who lack confidence in skills they possess are less likely to engage in tasks in which those skills are required, and they will more quickly give up in the face of difficulty. Given the generally lower confidence of most girls related to boys in the area of mathematics, it seems that young women are especially vulnerable in this area. As earlier discussed, Lent, Hackett, and their associates have demonstrated that self-efficacy beliefs influence the choice of majors and career decisions of college students (see Lent & Hackett, 1987). In some cases, underestimation of capability, not lack of competence or skill, is responsible for avoidance of math-related courses and careers, and this is more likely to be the case with women than with men. When this is the case, efforts to identify and alter these inaccurate judgments, in addition to continued skill improvement, should prove beneficial. Additional research should be aimed at exploring gender differences in academic self-efficacy beliefs, accuracy of self-perception, and the hypothesized effects of self-efficacy on choice, persistence, and perseverance. As outlined earlier, researchers will need to address that issue with assessments of self-belief that will provide these sorts of insights. Determining group differences using differences in scores on self-efficacy measures will only partly explain the nature of self-efficacy differences between groups. More direct ability comparisons between groups are required.

<u>Developmental Perspective of Self-efficacy Beliefs</u>

The sensitivity to context of self-efficacy beliefs makes them an ideal vehicle with which to explore the difference in perceptions of competence as a function of developmental factors. It seems likely that self-perceptions of competence take on different meanings and are weighed differently at different times in an individual's life (Wigfield & Karpathian, 1991). For example, Nicholls (1984) suggested that young children tend to view effort and ability as complementary; with age and schooling, they come to view them as contradictory (and see Nicholls & Miller, 1984a, 1984b). A better understanding of the development of academic self-efficacy beliefs, familial and schooling influences, and developmental factors that contribute to changes in self-efficacy will require longitudinal investigations that assess self-efficacy with allegiance to the theoretical guidelines earlier discussed. More information is also required about how students at various ages, academic levels, or grades use the diverse sources of efficacy information in developing self-efficacy beliefs. Because children judge their capabilities partly by comparing their performances with those of others, future studies should also explore the influence of peers on the development of self efficacy beliefs as well as the social comparative information that students find most useful in creating and developing these beliefs.

Distinguishing the Role of Self-efficacy as a Function of Race and Ethnicity

Graham's (1994) summary of the literature on the expectancy beliefs of African American students revealed that these students "maintain undaunted optimism and positive self-regard even in the face of achievement failure" (p. 103). Similar findings have been reported with Hispanic American samples (Lay & Wakstein, 1985; Stevenson, Chen, & Uttal, 1990). These findings have resulted primarily from studies of generalized, domain-specific self-concept of ability. When perceptions of competence are assessed as item-specific self-efficacy judgments, results can differ. Pajares and Kranzler (1995a, 1995b) reported that the mathematics self-efficacy of African American students was lower than that of White peers, and Pajares and Johnson (1996) found that the writing self-efficacy of Hispanic high school students was lower than that of non-Hispanic White students. In each case, despite differences in self-efficacy, minority students reported positive math self-concepts. It may be that beliefs at differing levels of specificity perform different functions for minority students (see Edelin & Paris, 1995). Graham acknowledged that self-efficacy is an important factor in the study of motivation but noted that it has been too sparsely examined in either race homogeneous or race heterogeneous studies. Self-efficacy beliefs assessed at differing levels of specificity might help explain the relationship between perceptions of competence and academic achievement, how these perceptions are related to other motivation factors, and whether the origins of these beliefs differ for minority children and across socioeconomic levels.

Clarifying the Influence of Social and Cultural Contexts on Self-Efficacy Beliefs

Bandura (1986) observed that there are a number of conditions under which self-efficacy beliefs do not perform their influential, predictive, or mediational role in human functioning. In prejudicially structured systems (p. 393), for example, students may find that no amount of skillful effort will bring about desired outcomes. In such cases,

students may possess the necessary skill and high self-efficacy required to achieve, but they may choose not to because they lack the necessary incentives. Self-efficacy will also have no bearing on performance if schools lack the effective teachers, necessary equipment, or resources required to aid students in the adequate performance of academic tasks. Bandura suggested that, when social constraints and inadequate resources impede academic performances, self efficacy may exceed actual performance because it is not so much a matter that students do not know what to do but rather that they are unable to do what they know. This observation may be insightful in light of findings regarding self-beliefs of minority students in some contexts. There is need to explore the role that schools play as social systems for developing and cultivating self-efficacy beliefs as well as the roles that the various incentives and disincentives such systems create play in the development of students' self-efficacy (and see Bandura, 1995).

Teacher efficacy may also have little bearing on teacher performance if schools lack the necessary equipment or resources required to aid students in the adequate performance of academic tasks or if teachers find themselves beleaguered day in and day out by practices, policies, or students they cannot control. In such situations, a sense of coping inefficacy has been linked to burnout in teachers (Chwalisz, Altmaier, & Russell, 1992). Research should be aimed at clarifying the role that schools play as social systems for developing and cultivating student and teacher efficacy beliefs, as well as the roles that the various incentives and disincentives such systems create play in the development of these beliefs.

As the world shrinks, attempting to understand to what degree the effects of self-efficacy are universal across cultures seems more critical than ever. Cross-cultural research will help clarify how efficacy beliefs are created and develop as a result of different cultural practices, as well as how these differing cultural practices influence children's efficacy beliefs about their schooling. Although there is already some evidence to suggest that self-efficacy beliefs have some similar effects across cultures (see Bandura, 1995), the link between culture and belief has yet to be made empirically. Moreover, the relationship between cultural differences and the effects of the cultural practices of institutions such as the family, the community, and the workplace on children's self-efficacy beliefs has yet to be determined (Oettingen, 1995).

Investigating Collective Efficacy

Bandura (1986) provided a valuable insight when he observed that confidence is both a personal and a social construct, that collective systems such as classrooms, teams of teachers, schools, and school districts develop a sense of collective efficacy -- a group's shared belief in its capability to attain their goals and accomplish desired tasks. Students, teachers, and school administrators operate collectively as well as individually. As a result, schools develop collective beliefs about the capability of their students to learn, of their teachers to teach and otherwise enhance the lives of their students, and of their administrators and policymakers to create environments conducive to those tasks.

Schools with a strong sense of collective efficacy exercise empowering and vitalizing influences on their constituents, and these effects are palpable and in evidence -- visitors speak of the schools' "atmosphere" or "climate" and describe them as "can-do" or effective schools (see Purkey & Smith, 1983). Bandura (1993) reported that collective efficacy mediated the influence of students' socioeconomic status, prior academic achievement, and teachers' longevity on the academic achievement of students in various middle schools. There is also evidence to suggest that the collective efficacy of teachers is related to personal teaching efficacy and satisfaction with the school administration (Fuller & Izu, 1986).

The extensive data gathering typically required in studies in which schools are the unit of analysis have prevented researchers from engaging in studies of collective efficacy, but the need and the challenge are there to tap greater insights from this potentially critical construct. For example, what role does a student's or teacher's own sense of efficacy play in the creation of a school's collective efficacy, and vice-versa? What role does the collective efficacy in place at a school play in the creation and development of novice teachers' and new students' entering sense of efficacy? Can collective efficacy undermine/enhance students' and teachers' sense of efficacy? Is collective efficacy "catching?"

Making the Connection from Research to Practice

Self-efficacy researchers have made noteworthy contributions to the understanding of self-regulatory practices and academic motivation, but the connection from theory and findings to practice has been slow. Classroom teachers and policy makers may well be impressed by the force of research findings arguing that self-efficacy beliefs are important determinants of performance and mediators of other variables, but they are apt to be more interested in useful educational implications, sensible intervention strategies, and practical ways to alter self-efficacy beliefs when they are inaccurate and debilitating to children (or teachers, or administrators).

Some self-efficacy researchers have suggested that teachers would be well served by paying as much attention to students' perceptions of competence as to actual competence, for it is the perceptions that may more accurately predict students' motivation and future academic choices (Hackett & Betz, 1989). Assessing students' self-efficacy can provide teachers with important insights. As earlier noted, researchers have demonstrated that self-efficacy beliefs strongly influence the choice of majors and career decisions of college students. Others have made the link to academic attitudes or self-regulatory strategies. Recall that, in some cases, unrealistically low self-efficacy perceptions, not lack of capability or skill, can be responsible for avoidance of courses and careers (Hackett & Betz, 1989). In such cases, in addition to skill improvement, researchers must acquaint schools with ways to identify these inaccurate judgments and must aid in designing and implementing appropriate interventions to alter them. School and teaching practices that foster both competence and the necessary accompanying confidence should be identified, as well as practices that "convert instructional experiences into education in inefficacy" (Bandura, 1997, p. 5-12). In a related vein, investigations of teacher efficacy

and the influence such self-beliefs have on teacher practices and student outcomes will help explain how teachers' beliefs influence students' beliefs and achievement.

There are cautions that should be taken as regards the nature and focus of interventions to increase self-efficacy. As is presently the case with self-esteem, there is the danger that self-efficacy may soon also come in a kit. Bandura's (1986) emphasis that mastery experience is the most influential source of self-efficacy information has important implications for the self-enhancement model of academic achievement earlier discussed. Self-enhancement proponents emphasize educational efforts that focus on improving students' self-beliefs in order to improve achievement. Social cognitive theorists focus on the important task of raising competence <u>and</u> confidence through authentic mastery experiences. Decades earlier, Erik Erikson (1959/1980) put it this way:

Children cannot be fooled by empty praise and condescending encouragement. They may have to accept artificial bolstering of their self-esteem in lieu of something better, but what I call their accruing ego identity gains real strength only from wholehearted and consistent recognition of real accomplishment, that is, achievement that has meaning in their culture. (p. 95)

<u>Encouraging Intertheoretical Crosstalk and Collaboration</u>

In some fashion, perceptions of capability play a prominent role in most theories of motivation. As earlier discussed, self-concept theorists point out that these percepts of self-worth include judgments of confidence. Consequently, self-efficacy is considered an important component of an individual's self-concept. The literature on self-schemas and possible selves provides a concept of self with four dimensions, one of which, the <u>efficacy</u> dimension, is characterized by individuals' beliefs about their potentialities (Garcia & Pintrich, 1994; Markus, 1977). According to attribution theory, the causal attributions that individuals make about the success or failure of their actions are related to their performance expectancies (Weiner, 1986). According to expectancy-value theory, motivation is primarily a result of individuals' beliefs about the likely outcomes of their actions and of the incentive value they place on those outcomes (Atkinson, 1957; McClelland, 1985; Rotter, 1982). Individuals will be motivated to engage in tasks when they value the outcome expected; they will be less predisposed to perform tasks whose outcomes they do not value. Expectancy-value theorists agree that judgments of competence play an interactive role with valued outcomes in determining the tasks in which individuals will engage (Eccles, 1983; Wigfield & Eccles, 1992). And goal theorists concur that self-perceptions of competence are important predictors of goals and outcomes, particularly for ability goals (Ames, 1992; Nicholls, 1984; Urdan & Maehr, 1995). Within the constructs that form the centerpieces of these theories, judgments of capability generally perform the functions that Bandura (1986) hypothesized.

Clearly, knowledge, competence, and various forms of self-knowledge and self-belief act in concert to provide adequate explanations of behavior (Bandura, 1986; Pintrich & Schunk, 1995). Such explanations cannot be had without considering the role that each may play in human decision-making and functioning in a given context. This rich and

often complex interplay may create situations in which neither self-efficacy nor any other single motivational construct may exercise a defining influence on nor be especially predictive of behavior (Schunk, 1991). Moreover, human functioning is such that discordances between beliefs and between belief and action are not only possible but likely. As James (1885/1975) observed, we often find that "the greatest enemy of any one of our truths may be the rest of our truths" (p. 43). Some students may be highly confident of their academic ability, but situations can occur under which it is doubtful they will behave in concert with their efficacy beliefs. Conversely, low self-efficacy may be overcome by valued and desired outcomes, potential rewards, or competing self-beliefs.

Self-efficacy beliefs themselves operate in concert with other sociocognitive factors, such as outcome expectations or goals, in the regulation of human behavior. But Bandura (1984) has argued that, because individuals' beliefs of personal competence "touch, at least to some extent, most everything they do" (p. 251) and because self-efficacy beliefs mediate to a great extent the effect of other determinants of behavior, when these determinants are controlled, self-efficacy judgments should prove excellent predictors of choice and direction of behavior. Human behavior is multiply determined, however, and its understanding and explanation require an appreciation of the interplay among the determinants that act as common mechanisms of personal agency. Commonality of mechanism, Bandura cautioned, should not be confused with exclusivity of mechanism. Hence, as self-beliefs and other constructs vie for predictive supremacy of academic outcomes, one need not fear that perceived self efficacy will "usurp the lion's share of the variance in human conduct" (p. 252). It serves no research agenda to engage in a duel of self-beliefs when deeper understandings of human behavior may be better had by exploring how, why, and under what conditions certain self-perceptions are especially useful and predictive.

If motivation theorists are to develop more complete understandings of the sources of this variance, it will be necessary for researchers with differing theoretical allegiances to engage in greater intertheoretical crosstalk and investigative collaboration using research designs and statistical models that incorporate the various constructs operationalized and used in a manner consistent with the construct's theoretical home. For example, self-concept researchers incorporating self-efficacy beliefs into studies of self-concept might ensure that these self-perceptions of capability are assessed at an appropriate level of specificity and correspond with the performance variables under investigation. Results would then be more easily comparable to those of self-efficacy investigations and help inform the tenets of each theory. For their part, self-efficacy researchers would take the same methodological precautions when assessing and using motivation constructs from other theoretical homes. In studies requiring the use of self-report instruments, researchers might conceptualize and assess a construct by using instruments consistent with those created by researchers from the construct's theoretical home, in addition to alternative conceptualizations or definitions, so as to shed light on the role of the differing conceptualizations. This is not to suggest that researchers should be engaging in cafeteria theorizing. Rather, it is to argue that good manners and the pursuit of scholarship requires that researchers be attentive to the ways and means of competing

theoretical orientations. The purpose of intertheoretical crosstalk ought not be to cafeteria theorize but to identify the contexts in which certain motivation constructs may be better predictors of human functioning as well as the unique role that each construct plays in the general development of self-regulatory skills. The result would be a clearer and deeper understanding of the nature of the interplay among the differing self-beliefs, other motivation constructs, self-regulatory processes, and academic performances.

If I may be permitted to come full circle, this chapter began with the observation that the time is propitious to assess the direction that self-efficacy research in academic contexts has taken since its inception two decades ago. It seems both warranted and prudent to conclude that research findings over these past 20 years have strengthened Bandura's (1986) claim that self-efficacy beliefs play an influential role in human agency. The clear implication that emerges from this conclusion is that researchers and school practitioners should look to students' self-beliefs about their academic capabilities, for they are important components of motivation, self-regulation, and academic achievement. Findings from this line of inquiry should continue to provide a powerful contribution to educational practice, policy, and theory.

<h2 align="center">References</h2>

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Footnote

Some researchers have argued that self-concept and self-esteem are distinct constructs, with self-concept performing a descriptive function and self-esteem an evaluative one (Beane, Lipka, & St. Bonaventure, 1980; Blyth & Traeger, 1983; Coopersmith & Feldman, 1974; and see Wigfield & Karpathian). Shavelson, Hubner, and Stanton (1976) and Shavelson and Bolus (1982), however, concluded that the two are not empirically separable and that self-concept may be thought of as having seven distinct features: It is organized, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable. This multidimensional nature of self-concept permits an understanding of self-esteem as one of the dimensions of self-concept. For this reason, self-concept and self-esteem are often used interchangeably in self-concept literature and nearly always as regards mathematics (i.e., math self-concept). Return to manuscript

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Self-Efficacy page