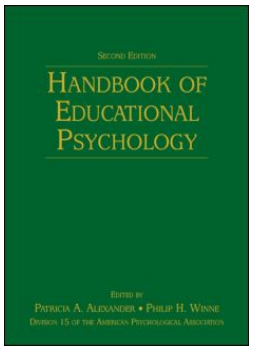

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COMPETENCE AND CONTROL BELIEFS: DISTINGUISHING THE MEANS AND ENDS

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With the paradigm shift from behaviorism to cognitive information processing that occurred between the late 1950s and mid-1960s, psychologists began to take into account individuals' cognitions to explain behavior rather than focusing only on environmental variables and events. One manifestation of this shift was an emphasis on *self-beliefs*, or beliefs people have about their thoughts, feelings, and actions, and those of others. In particular, educational psychologists have explored how self-beliefs are formulated, how they change with development and experience, and how they influence outcomes such as learning, motivation, self-regulation, and achievement.

This chapter examines two types of self-beliefs in educational contexts—competence and control—with special focus on their role in motivation and achievement. The following section defines and distinguishes competence and control beliefs and presents a model for classifying theories according to their treatment of these constructs. The next section provides a historical background on competence and control beliefs and describes some early perspectives that stressed their influence on behavior. Five theories then are examined that postulate a key role for competence and/or control beliefs in motivation and achievement: achievement motivation theory, attribution theory, social cognitive theory, goal theory, and self-determination theory. The relevance of these beliefs to the related processes of self-regulation, metacognition, and volition is discussed. The chapter concludes with recommendations for future research and implications for educational practice.

DEFINITIONS AND DISTINCTIONS

There is debate among educational researchers about the precise nature of competence and control beliefs, and the boundaries between the two are not always clearly demarcated. In this chapter *competence beliefs* are defined as students' perceptions about their means, processes, and capabilities to accomplish certain tasks. These beliefs are self-evaluative because learners must weigh their knowledge, skills, and strategies, against the demands of the task to determine perceptions of competence. Competence beliefs are reflected in the following statements: "I am very sure that I can solve these math problems," "I am certain that I can learn the material in this section of the book," and "I know that I can high jump over that bar."

Control beliefs are students' perceptions about the likelihood of accomplishing desired ends or outcomes under certain conditions. Control beliefs refer to the outcomes of actions, not to the actions themselves. Simply feeling competent does not guarantee the perception of control, because the conditions to learn or perform often are unfavorable. Control beliefs are reflected in

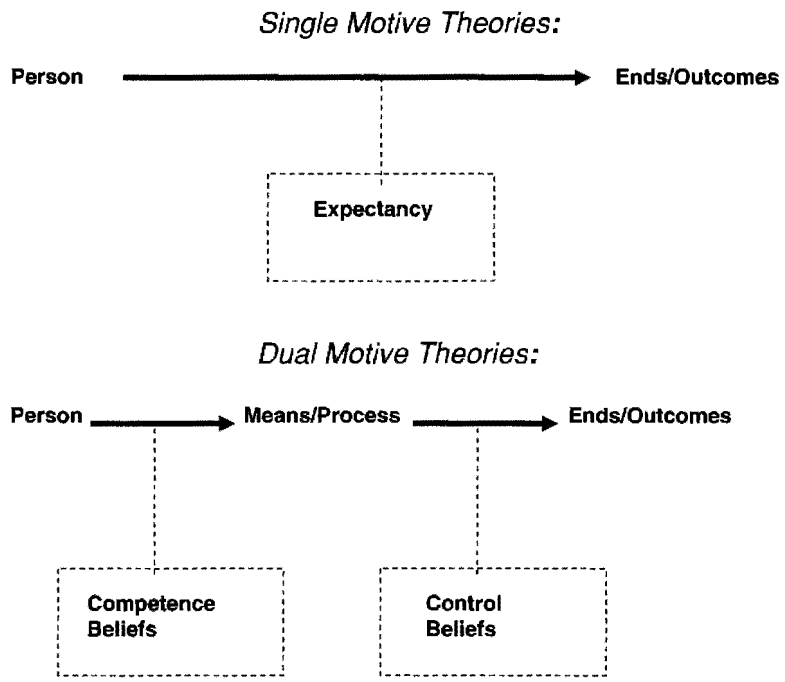

FIGURE 16.1. Model for distinguishing competence and control beliefs in psychological theories.

statements such as: "If I study the material diligently I know I can perform well on the test," "I know that I will have enough time to solve these problems," and "If I try my best I know that I can run a fast time."

Both competence and control beliefs are types of *expectancies,* or perceptions about future events. Competence beliefs are expectancies about one's capabilities to learn or perform actions; control beliefs are expectancies about the consequences of actions.

Older theories of motivation and achievement typically did not distinguish competence from control beliefs and included only one type of expectancy. This expectancy construct may have reflected primarily competence beliefs or primarily control beliefs or some of both. In contrast, contemporary theories often distinguish these two types of beliefs. The educational implication of this distinction is that a perceived lack of competence should be addressed differently than a perceived lack of control. Students who lack perceived competence may require educational interventions that help them develop skills, whereas those with low perceived control may need opportunities to use the skills they possess to accomplish desired ends.

This theoretical distinction is portrayed in Fig. 16.1 and is patterned after the process-outcome distinction model of self-regulation proposed by Zimmerman and Schunk (2004). Single motive theories postulate that expectancy beliefs mediate the relation between the person and the outcome, but they do not differentiate these beliefs. In contrast, dual motive theories postulate separate competence and control beliefs. Competence beliefs come into play when students select means and processes to use to learn or perform actions. Control beliefs are important in helping to link those actions with desired outcomes.

Contextual factors are seen as key influences on students' control beliefs. Theories that give strong emphasis to these factors also predict that although competence and control beliefs often are consistent, they need not be. Thus, students who feel competent about learning generally expect positive outcomes for their efforts. Learners who feel competent in mathematics expect to perform well in courses and receive high grades. Students who feel competent about learning might not expect positive outcomes if they perceived little control over outcomes, such as classes in which the teachers give good grades to the students they like regardless of how well the students perform. Under the latter conditions, motivation and learning suffer.

HISTORICAL BACKGROUND

Understanding how competence and control beliefs were treated in earlier theories helps to clarify the processes

portrayed in Fig. 16.1 and illuminates the evolution from single to dual motive theories. This section does not cover historical theories in depth because these are not the focus of this chapter. Readers who desire more historical background—especially on how earlier theories treated self-beliefs—are referred to other sources (Pajares, 2003; Pajares & Schunk, 2002; Zimmerman & Schunk, 2003).

Competence and control beliefs enjoyed no position of prominence until the paradigm shift (mentioned earlier) occurred because behaviorism was dominant in psychology. The basic tenet of behaviorism was that for psychology to be a meaningful discipline it had to emphasize what other scientific disciplines did—observable events, such as behavior. Self-perceptions and other internal (mental) states could play no meaningful role. Although behaviorists did not deny the existence of mental states (they did, after all, have to think about their theories and experiments), they believed that mental states added nothing to explanations of behavior. Rather, one looked to the conditions in the environment (see also Perry, Turner, & Meyer, Chapter 15 of this volume).

The remainder of this section describes three theoretical perspectives that challenged the assumptions of behaviorism and included competence or control beliefs as influences on behavior: humanistic theories, locus of control, and self-concept.

Humanistic Theories

Humanistic theories discuss individuals' capabilities and potentialities as they make choices and seek control over their lives. Unlike behaviorism, which attempted to reduce behavior to discrete acts, humanistic theories are holistic and contend that to understand why people act as they do requires understanding their behaviors, thoughts, and feelings. The notions of competence and control are central to these views.

Although there were several participants in the humanistic movement, two of the most influential were Carl Rogers and Abraham Maslow. Rogers (1963) believed that life represented an ongoing process of growth and achieving wholeness, and that this *actualizing tendency* was an innate fundamental human motive. Rogers described the actualizing tendency as "a tendency toward fulfillment, toward actualization, toward the maintenance and enhancement of the organism" (Rogers, 1963, p. 6).

According to Rogers, people's perceptions about themselves played the critical roles in their development and adjustment. The development of self-awareness produced a need for *positive regard,* or feelings such as respect, liking, warmth, sympathy, and acceptance. People also have the need for *positive self-regard,* or positive regard that derives from personal experiences. The actualizing tendency develops when people accept all of their experiences, and their self-perceptions are consistent with the feedback they receive from others.

Maslow (1954) promulgated a theory postulating that people are motivated by needs that are hierarchically organized. Basic needs (e.g., survival, safety) must be satisfied before higher order needs (e.g., belonging, esteem) can be fulfilled. The ultimate goal—although few people ever may attain it—is the final level of *self-actualization,* defined as the developing of one's full potential as evidenced by self-fulfillment and contentment.

For Maslow, as with Rogers, a general sense of self was the central construct of the human personality. One's perceptions of oneself—including competence beliefs—and desire to influence control over the fulfillment of needs were primary motivators of behavior. Humanistic ideas are useful for a general understanding of human behavior and for counseling, but the generality of their central constructs (actualizing tendency, control of need satisfaction) limits empirical investigations that could specify their role in an overall theory of human functioning.

Locus of Control

Rotter (1966) advanced a social learning theory that included *locus of control*—a motivational construct that refers to generalized control over outcomes. People differ in where they believe this control lies. Individuals may believe that outcomes occur independently of how they act (external control) or that outcomes are highly contingent on their actions (internal control).

Rotter (1966) assumed that generalized perceptions of control could affect outcomes across domains; however, other investigators have noted that locus of control can vary depending on the situation (Phares, 1976). Regardless of whether locus of control is generalized or situationally specific, its educational importance stems from its motivational effects. Students who believe they can control outcomes are more likely to choose to engage in those situations, expend effort, and persist. Those who believe that their behaviors have little impact on outcomes would not be expected to demonstrate the same level of motivation because they will believe that factors outside of their control will be primarily responsible for success or failure.

Locus of control is a type of *outcome expectation,* or belief about the anticipated outcomes of actions. Although research supported the operation and effects of locus of control (Rotter, 1966), general constructs often do not predict behaviors in specific situations (Bandura, 1986). Further, as a type of outcome expectation, locus

of control alone is insufficient to predict achievement behavior. Students with a strong sense of internal control who believe that they can write an excellent essay may nevertheless not put forth the effort if they believe that no matter how good their work is the instructor will not reward it. Conversely, students who believe that the instructor will reward them may not work hard if they doubt their capability to put forth the requisite effort. Clearly other types of beliefs are needed to adequately explain achievement behavior.

Self-Concept

Although not a theory as such, self-concept is germane to the topic of competence and control beliefs. Self-concept has been defined in various ways, but it typically is construed as a general construct that reflects one's collective self-perceptions formed through experiences with the environment and interpretations of those experiences and influenced by interactions with significant other persons (Shavelson & Bolus, 1982). Researchers exploring the structure of self-concept have identified its critical features: organized, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable (Marsh & Shavelson, 1985).

The hierarchical feature refers to the notion that one's self-perceptions in specific situations give rise to more general self-concepts. These general self-concepts contribute to a global self-concept. With respect to academics, self-perceptions in specific domains lead to self-concepts in various subject areas such as mathematics and science. These in turn contribute to an academic self-concept.

Much research has explored the relation of self-concept to learning and achievement. Wylie (1979) reviewed self-concept research and obtained a correlation of $r = +0.30$ between global self-concept and academic achievement. This moderate relation suggests that other factors are important. Hansford and Hattie (1982) analyzed several studies and found positive, negative, and no correlation between self-concept and achievement.

More specific measures of self-concept typically bear a stronger relation to achievement (Pajares & Schunk, 2001, 2002). Wylie (1979) found limited evidence for stronger associations between self-concepts of ability and achievement than between overall self-concept and achievement.

Competence beliefs are inherent in the definition and measurement of self-concept, but self-concept typically does not address control beliefs. Another issue is that as self-concept becomes defined more specifically, it resembles other constructs discussed in this chapter (e.g., self-efficacy). Although self-concept is an active research area, it does not provide the type of unified treatment of competence and control beliefs needed to understand their operation in educational contexts.

CONTEMPORARY PERSPECTIVES ON COMPETENCE AND CONTROL BELIEFS

This section discusses five contemporary psychological theories that assign a prominent role to competence and/or control beliefs: achievement motivation theory, attribution theory, social cognitive theory, goal theory, and self-determination theory. Their treatment of competence and control beliefs and some key research findings are described. Table 16.1 summarizes each theory's major points regarding these beliefs.

Achievement Motivation Theory

Classical theory. *Achievement motivation*, or the desire to display competence in activities (Elliot & Church, 1997), has been the subject of scientific study for many years (see also Anderman & Wolters, Chapter 17 of this volume; Perry et al., Chapter 15 of this volume). Murray (1938) included the achievement motive among the psychological needs that affected personality development. Motivation resulted from the desire to satisfy needs. Murray (1936) also devised the *Thematic Apperception Test (TAT)*, a projective technique comprising a series of ambiguous pictures shown to participants who then made up stories or answered a set of questions. McClelland, Atkinson, Clark, and Lowell (1953) adapted the TAT to assess the achievement motive.

A breakthrough in the study of achievement motivation was *expectancy-value theory*, developed by Atkinson and his colleagues (Atkinson, 1957; Atkinson & Feather, 1966; Atkinson & Raynor, 1974). Atkinson drew on work by Lewin and others on the *level of aspiration* or goal that people set in a task (Lewin, Dembo, Festinger, & Sears, 1944). Their research showed that successes raised level of aspiration and that failures lowered it. People generally felt more successful when they met the goals they had set for themselves than when they attained objective standards. Level of aspiration is a type of competence belief that is affected by individual and group experiences.

In Atkinson's theory, achievement behavior was a function of one's (a) expectancy of attaining a given outcome contingent on performing certain behaviors, and (b) value that one placed on that outcome. Motivation resulted from the belief that a valued outcome was attainable.

TABLE 16.1. Psychological Theories Emphasizing Competence and Control Beliefs

Theories	Competence Beliefs	Control Beliefs
Achievement motivation theory	Atkinson's theory did not address competence beliefs, but Eccles and Wigfield's theory states that task-specific judgments of ability or competence influence one's expectancies for success.	Atkinson's construct of expectancy is a form of control belief because it reflects the idea that certain actions lead to successful outcomes.
Attribution theory	Competence beliefs are not addressed directly in this theory, but attributions can give rise to perceptions of competence or incompetence that have motivational effects.	Attribution theory emphasizes the role of control beliefs in motivating students to persist in their efforts to learn and perform academically. Students perceive optimal control when outcomes are attributed to internal, stable, and controllable causes.
Social cognitive theory	The key competence belief in Bandura's theory is self-efficacy, which refers to expectancies about one's capabilities to learn or perform at designated levels. The attainment of self-efficacy is a key source of academic motivation.	Outcome expectancy is a control variable because it reflects personal confidence that certain outcomes will result from given actions. Both outcome and self-efficacy expectancies are necessary to be optimally motivated.
Goal orientation theory	A mastery or learning goal orientation focuses one's attention on processes and strategies that can improve one's competence.	Performance goals focus on controlling one's success and failure experiences via selective exposure to socially competitive events.
Self-determination theory	The need for competence refers to a generalized need to master one's environment.	The need for autonomy refers to one's desire to experience a sense of control, agency, or autonomy in environmental interactions (i.e., an internal locus of causality).

Achievement behavior represented a conflict between approach (*hope for success*) and avoidance (*fear of failure*). The conflict resulted because any achievement action could result in success or failure. Individuals gauge the probability of success and failure. *Resultant achievement motivation*—expressed mathematically—was the tendency to approach an achievement goal decreased by the tendency to avoid failure. Thus, having a high hope for success did not automatically lead to achievement behavior because the strength of the motive to avoid failure also had to be taken into account. Achievement behavior was strongest when a high hope for success was combined with a low fear of failure.

The theory predicts that students high in resultant achievement motivation will select tasks of intermediate difficulty, or those they believe are attainable and whose outcomes are valued. Difficult tasks—for which success is unlikely—are apt to be avoided, as are easy tasks whose accomplishment holds little value. Conversely, students low in resultant achievement motivation should be more likely to select either easy or difficult tasks. The former require little effort, whereas the latter—because they are virtually unattainable—provide one with reasons for not expending effort because effort is unlikely to produce success.

Research on Atkinson's theory has yielded mixed results (Cooper, 1983; Ray, 1982). The prediction that high achievement motivation leads to a preference for tasks of intermediate difficulty is problematic. Kuhl and Blankenship (1979), for example, found that with repeated task success, students tended to choose more difficult tasks; this outcome did not vary as a function of the individual's motive to attain success or motive to avoid failure. It also seems likely that task success builds perceived competence, which leads people to select tasks of greater difficulty. Atkinson's theory did not address competence beliefs and likely overestimated the importance of the achievement motive.

Research also has addressed the development of the achievement motive. Rosen and D'Andrade (1959) studied parents' interactions with their sons. Parents of boys with high achievement motivation interacted more with them, gave more rewards and punishments, and held higher expectations for them, compared with parents of boys with low achievement motivation. It is difficult, however, to isolate parental behaviors that help develop children's achievement motivation because parents display many behaviors with their children.

As shown in Table 16.1, Atkinson's expectancy for attaining a given outcome as a result of performing certain actions is a type of control belief because it reflects the idea that certain actions lead to given outcomes. The theory does not directly address the issue of perceived competence. Another issue with this theory is that a global achievement motive rarely manifests itself uniformly across different achievement domains. Because the achievement motive varies with the domain—perhaps partly because of differences in control

beliefs—how well a general trait predicts behavior in specific situations is questionable. Contemporary views of achievement motivation have addressed these issues.

Contemporary Theory. Researchers have built on the original expectancy-value theoretical foundation by incorporating constructs to give the theory better explanatory power. The theory of Eccles and Wigfield (Eccles, 1983, 1993; Wigfield, 1994; Wigfield & Eccles, 2000; see also Chapters 15 and 17 of this volume), which is complex and has many predictors of achievement behavior, postulates that two important influences are expectancy and task value. Unlike Atkinson's theory, this theory does not highlight a general motive to achieve.

The *expectancy* construct refers to the issue of whether one can accomplish the task (Pintrich & Schunk, 2002). The expectancy variable is actually a type of expectancy for success: for example, students' beliefs about how well they will do on a future test.

The *value* component addresses the question, "Why should I do this task?" (Pintrich & Schunk, 2002). "Value" is multifaceted and includes attainment value (importance of doing well on a task), intrinsic value (interest and enjoyment experienced while performing the task), utility value (perceived usefulness of the task in terms of future goals), and cost belief (perceived negatives of doing the task in terms of what cannot be done instead).

Individuals' judgments of ability or competence influence their expectancies for success. Ability judgments are domain specific self-beliefs and pertain to the subject area or task at hand. There are other cognitive and affective variables in the theory, but there is no specific control variable. Perceptions of control may be assumed (i.e., expectancies for given outcomes) but they are not made explicit.

Research on this model has yielded a great deal of support for the predicted effects of variables and relations among them. Studies have employed both cross-sectional and longitudinal designs that assess beliefs and achievement of students at different developmental levels. Higher expectancies for success have been shown to relate positively to task choice, persistence, and achievement (Eccles, 1983; Wigfield, 1994). Expectancies and task-specific self-concepts (perceptions of ability or competence) are mediators between environmental events and achievement actions. Values have been shown to be positively related to achievement, although when both expectancies and values are used as predictors expectancies are typically stronger (Pintrich & Schunk, 2002). In contrast, values—especially attainment, intrinsic, and utility value beliefs—are excellent predictors of intentions to take courses and enrollment in them. Values seem more important for achievement choices, whereas expectancies bear a stronger relation to achievement.

There also has been considerable research on the development of children's achievement beliefs and values (Wigfield & Eccles, 2002). Children have reported a decrease in self-perceptions of competence as they move into adolescence, with the sharpest decline occurring when they make the transition from elementary to middle or junior high school. In addition, elementary children (third and fourth graders) displayed low levels of congruence between their self-perceptions of competence and more-objective measures (e.g., teacher grades), whereas middle/high school children (eighth and ninth graders) reported higher levels of congruence in these measures. Both of these findings may be due to high self-perceptions of competence reported by students in the early elementary grades. These younger students' overestimates may in turn be due to their tendency to use an absolute standard to judge their academic competence instead of the social comparative standard, which is used by older students (Blumenfeld, Pintrich, & Hamilton, 1987).

Regarding developmental changes in children's task values, Wigfield and Eccles (1992) found that children in the early elementary school grades do not distinguish reliably among three key forms of task values—interest, utility, and importance—but can do so by the time they reach the fifth grade. Paralleling developmental changes in competence ratings, children's value ratings for interest, importance, and utility of school subjects generally decrease with age, especially during the transition from elementary to middle or junior high school. This decline in academic values may be due to students' efforts to protect their self-esteem. For example, if students perceive themselves as declining in mathematical competence, they would not experience a corresponding decline in self-esteem if mathematics were devalued.

The achievement motivation theory advanced by Eccles and Wigfield includes different types of competence beliefs (Table 16.1). There is a question about how well they are empirically differentiated and whether in making judgments they are clearly differentiated in students' minds (Pintrich & Schunk, 2002). The notion of control does not appear as a separate variable. More research clearly is needed on the variables specified in the theory, especially on the causal ordering of expectancies and values. For example, do higher expectancies for success lead students to value tasks more, does value develop first and then as students experience success they gain expectancies for success, or do values and expectancies influence one another?

Attribution Theory

Attributions are perceived causes of outcomes. Attribution theory explains how people perceive the causes of

their actions and those of others (Weiner, 1985). The assumption is that people are motivated to seek information to form attributions. In turn, attributions have motivational consequences. The process of assigning attributions is governed by principles. Attribution researchers have sought to determine those principles and have investigated how people's attributions (and therefore their achievement behaviors) can be changed.

Rotter's (1966) *locus of control* (discussed earlier) incorporates attributional concepts. Another historical influence on contemporary attribution was Heider's *naive analysis of action*. Heider (1958) examined what ordinary people believe are the causes of events in their lives (*naive* means that the average person is unaware of the objective influences). According to Heider, people attribute causes to internal (effective personal force) or external (effective environmental force) factors. The personal force comprises two factors: power (abilities) and motivation (trying). Together power and environment constitute the *can* factor, which when combined with the *try* factor is used to explain outcomes. One's power is relative to the environment, because the environment may aid or restrict what one can accomplish. Assuming that ability is sufficient to overcome environmental forces, then trying (effort) influences outcomes.

Heider's framework was general and provided few testable hypotheses. Other researchers have drawn from his work and formulated more explicit theories. Weiner's attribution theory is described next.

Attribution Theory of Achievement. A series of studies by Weiner and his colleagues provided the basis for an attributional theory of achievement (Weiner, 1979, 1985; Weiner et al., 1971; see also Chapter 17 of this volume). These investigators postulated that achievement successes and failures are largely attributed to such general factors as ability, effort, task difficulty/ease, and luck. There are other attributions (e.g., illness, physical appearance), but these four are common in achievement contexts.

Drawing on the work by Rotter and Heider, Weiner et al. (1971) classified causes along two dimensions: locus (internal/external to the person), and stability(relatively stable/unstable over time). Ability is internal and relatively stable; effort is internal and unstable; task difficulty/ease is external and relatively stable; luck is external and unstable. Weiner (1979) added a third dimension of controllability (controllable/uncontrollable by the person) to create a $2 \times 2 \times 2$ classification. Effort is a controllable factor, whereas task difficulty is uncontrollable. Immediate effort is internal and unstable, but there also may be a general effort factor (typical effort) that is more stable. Although this classification has proven to be useful in research, how attributions are classified (and therefore their consequences) may vary across individuals and cultures. Thus, "help from others" presumably is controllable, but some students may believe that they can exert little control over the help they receive—perhaps because they have unresponsive teachers.

In forming attributions people use situational cues. Cues for ability attributions are the ease, speed, or frequency of success; cues for effort attributions are physical or mental exertion; cues for task difficulty/ease are social norms (how others do) and task features; and cues for luck are randomness of outcomes and lack of relation of outcomes to effort.

Attributions are important because they have motivational consequences. The stability dimension is postulated to influence expectancy of success. Assuming that task conditions remain stable, attributions of success to stable causes should lead to higher expectations of future success than attributions to unstable causes. The locus dimension is hypothesized to influence affective responses. People experience greater pride/shame after succeeding/failing when outcomes are attributed to internal/external causes. Controllability has diverse effects. Feelings of control promote choice of academic tasks, effort, and persistence. Students who believe they have little control over academic outcomes have low expectations for success and motivation to succeed.

Attributional researchers have examined the process whereby individuals form attributions and attributional consequences (Pintrich & Schunk, 2002). In general this research has provided support for the theory and its predictions, although there are further issues to be addressed such as whether there are two distinct types of effort and whether external factors can be controlled.

Another type of research is attributional change, in which researchers attempt to improve students' motivation by altering their attributions for success and failure. For example, some students attribute difficulty in learning to low ability. This is dysfunctional for motivation because it can lead to lack of trying and skill improvement. Change programs that stress the value of effort try to alter students' attributions of low ability to insufficient effort.

Dweck (1975) compared children who always succeeded on tasks with those who occasionally failed and were given feedback stressing effort (need to work harder). On a subsequent test where all children were given insolvable problems, the attribution retraining children showed less performance impairment than those who always had succeeded. Research shows that dysfunctional attributions can be altered and that stressing effort can lead to improved performance (Pintrich & Schunk, 2002).

Developmental research shows that young children do not have clearly differentiated conceptions of ability and effort, but that these begin to differentiate by the

later elementary years (Nicholls, 1983). After that, children may value ability more than effort, which presents a paradox because teachers tend to emphasize effort. The credibility of effort feedback also is critical. Effort feedback on easy tasks can signal that the person providing the feedback doubts the student's ability to learn. Thus, effort feedback seems most credible in the early stages of learning when students must expend effort to succeed. As students develop competencies, switching to ability feedback can have better motivational effects (Schunk, 1984).

Attribution theory emphasizes the role of control beliefs in motivating students to persist in their efforts to learn and perform well academically. From this theoretical perspective, students perceive optimal control when outcomes are attributed to internal, stable, and controllable causes. Competence beliefs, on the other hand, are not addressed directly, but attributions can give rise to perceptions of competence or incompetence that have motivational effects.

Social Cognitive Theory

Social cognitive theory counts various perspectives as its predecessors including the social learning theories of Miller and Dollard (1941) and Rotter (1954). Beginning in the 1960s, Bandura and his colleagues conducted a series of research studies on observational learning (Bandura & Walters, 1963). This work set the stage for Bandura's (1986) social cognitive theory of human behavior. Competence perceptions and control beliefs are integral components of the theory.

Bandura (1986) discussed human behavior within a framework of *triadic reciprocality*, or reciprocal interactions among behaviors, environmental variables, and personal factors (e.g., cognitions). Thus, one's actions can change the environment and affect how one thinks about oneself; the environment can affect what we do and think; and how we think can affect what we do and how we view the environment.

In this model of reciprocal causation, people are both producers and receivers of environmental influence. Self-referential processes allow people to go beyond immediate environmental stimuli and exert a large measure of control over their lives through planning, organizing, and self-regulation (Zimmerman, 2000).

The central variable representing competence beliefs is *self-efficacy*, defined as people's beliefs about their capabilities to learn or perform actions at designated levels (Bandura, 1997). In gauging self-efficacy, people assess their skills and capabilities to translate those skills into actions. Self-efficacy is a key to promoting a sense of *agency* in individuals that they can influence their lives (Bandura, 1997, 2001; see also Chapter 15 of this volume).

Self-efficacy is contrasted with another social-cognitive variable—*outcome expectations*, or beliefs about the expected consequences of actions. Outcome expectations are types of control beliefs. Self-efficacy and outcome expectations often are related; for example, self-efficacious students expect to perform well and receive positive outcomes for their efforts (e.g., high grades). But there is no automatic connection between self-efficacy and outcome expectations. Students may expect positive outcomes if they perform well on a test (e.g., teacher praise, A grade), but may doubt their capabilities to study diligently enough to perform well.

Self-efficacy is primarily a domain-specific construct. It is contrasted with self-concept (discussed earlier), or one's collective self-perceptions (Pajares & Schunk, 2002). Although self-efficacy is influenced by one's abilities, it is not synonymous in meaning with them. Research shows that students of different ability levels differ in their self-efficacy (Collins, 1982).

Self-efficacy has diverse effects in achievement settings (Bandura, 1997; Pajares, 1996; Schunk, 1995). Self-efficacy can influence choice of activities. Students with low self-efficacy for learning may avoid tasks, whereas those who feel efficacious should participate more eagerly. Self-efficacy also affects effort expenditure, persistence, and learning. Students who feel efficacious about learning generally expend more effort and persist longer than those who doubt their capabilities, especially when they encounter difficulty. In turn, these behaviors promote learning.

People acquire information to gauge their self-efficacy in a given domain from various sources: actual performances, vicarious experiences (e.g., social models), persuasive information, and physiological symptoms (e.g., sweating, heart rate) (Bandura, 1997). Information acquired from these sources does not automatically influence self-efficacy but rather is cognitively appraised. Self-efficacy appraisal is an inferential process in which individuals weigh and combine the contributions of personal, behavioral, and environmental factors. Persons consider factors such as perceptions of their ability, effort expended, task difficulty, teacher assistance, and number and pattern of successes and failures (Bandura, 1997; Schunk, 1995).

Research on developmental changes in academic self-efficacy has revealed a complex pattern of outcomes. Shell, Colvin, and Bruning (1995) studied self-efficacy for reading and writing *tasks* (e.g., writing a letter to a friend) and self-efficacy for reading and writing *skills* (e.g., use the correct part of speech in your writing). They found a developmental increase in self-efficacy for reading and

writing tasks across fourth, seventh, and tenth graders, but not in self-efficacy for reading or writing skills. Zimmerman and Martinez-Pons (1990) studied students' self-efficacy beliefs for solving specific mathematical problems or defining specific words across fifth, eighth, and eleventh graders and found significant developmental increases in self-efficacy on both tasks. Both studies revealed increases in self-efficacy to manage specific academic tasks as students' progress through the grades.

Recently Pajares, Valiante, and Cheong (in press) studied self-efficacy beliefs using items that also focused on writing skills, such as "write a strong paragraph that has a good topic sentence or main idea," with students from the fourth through eleventh grades. These researchers found that these self-efficacy beliefs declined as students moved from elementary to middle school but then remained stable through high school. Thus, although self-efficacy for completing specific academic tasks may increase developmentally, self-efficacy for academic skills may decline during elementary school but stabilize during middle and high school. It is possible that students' completion of specific tasks, such as writing to a friend or what one did on summer vacation, are judged in terms of absolute standards of success or failure, whereas academic skills, which are emphasized by teachers, are evaluated using peer comparison standards.

Research has shown that self-efficacy is a key variable predicting learning, motivation, and achievement, and that self-efficacy is a stronger and more consistent predictor of motivation and performance than are general constructs (e.g., self-concept) (Pajares, 1996; Schunk, 1995; Schunk & Pajares, 2004). Research also shows that educational interventions can enhance self-efficacy, motivation, and achievement. Positive effects on self-efficacy have been obtained by teaching students to set proximal goals and assess progress, providing them with opportunities to evaluate their progress in learning, giving them feedback linking their successes to effort and ability, having them work on progress goals that involve skill acquisition, having them self-monitor and record their progress, and linking rewards to the level of their performance (Schunk, 1995; Schunk & Ertmer, 2000).

Social cognitive theory addresses the notion of personal agency over important aspects of one's life, which involves perceptions of competence and control. Both positive self-efficacy and outcome expectations are necessary to optimally motivate: Students with a strong sense of agency expect to perform well and receive positive outcomes for their efforts (e.g., praise). A sense of agency also depends on one's *self-regulatory skill*, or the processes whereby students activate and sustain behaviors, cognitions, and affects, which are systematically oriented toward the attainment of learning goals (Zimmerman, 2000). Individuals can gain greater self-regulatory competence by developing effective learning strategies, practicing time management, arranging an environment conducive to learning, setting goals and assessing progress, maintaining a sense of self-efficacy for learning, and rewarding themselves for progress (Zimmerman, 2000). The literature on self-regulation underscores its relevance to developing the belief that one can control many important events in one's life (self-regulation is discussed later in this chapter).

Goal Theory

Goal theory postulates that important relations exist among individuals' goals, goal orientations, expectations, attributions, conceptions of ability, social and self-comparisons, and achievement behaviors (Linnenbrink & Pintrich, 2002; Pintrich, 2000). Goal theory incorporates many constructs shown to be important for motivation and learning, and it attempts to relate them in systematic fashion. The theory addresses a wide array of variables in explaining achievement behavior, some of which do not directly involve goals. This is a key difference between goal theory and goal-setting theory (Locke & Latham, 1990), which is more concerned with how goals are established and altered and with the roles of their properties (e.g., specificity, difficulty, proximity).

A key construct in goal theory is *goal orientation*—the purpose and focus of an individual's engagement in achievement activities or the reasons for engaging in academic tasks (Anderman, Austin, & Johnson, 2002; Pintrich, 2000; see also Chapter 17 of this volume). Goal orientation also bears directly on perceptions of competence and control beliefs, as discussed later. A central feature of goal theory is its emphasis on how different types of goal orientations can influence achievement actions.

One distinction is between mastery and performance goals (Dweck, 1999, 2002; see also Chapter 15 of this volume). A *mastery goal* reflects a focus on the acquisition of knowledge, skill, and competence, relative to one's prior performance; a *performance goal* involves a focus on striving to demonstrate competence by outperforming others (Elliot & Harackiewicz, 1996; Pintrich, 2000). Other types of goals that are conceptually similar to mastery goals are learning, task-involved, and task-focused goals; those similar to performance goals include ego-involved and ability-focused goals.

Goal orientations are distinguished because they are hypothesized to have different effects on achievement behaviors. Although there is ongoing debate about the benefits of different goal orientations, most researchers stress the desirability of mastery goals (Dweck, 1999; Pintrich,

2000). A mastery goal orientation focuses students' attention on processes and strategies that help them acquire skills and improve their competencies. The task focus presumably motivates behavior and directs and sustains attention on task features critical for learning. Students who pursue a mastery goal are apt to feel self-efficacious for attaining it and be motivated to engage in activities that assist their learning (e.g., expend effort, persist, handle distractions). Self-efficacy is substantiated as they work on the task and note their progress. The perception of progress sustains motivation and furthers skill acquisition (Schunk, 1995).

In contrast, because a performance goal orientation focuses attention on outperforming others, it does not highlight the importance of the processes and strategies needed to learn or raise self-efficacy for learning. Students may not compare their present and past performances to determine progress. Performance goals typically lead to social comparisons with others to determine progress, which can result in low perceptions of competence among students who do not perform as well as their peers. Lower perceived competence can reduce motivation for learning. Thus, performance goals focus on controlling success and failure experiences via selective exposure to socially competitive events.

Pintrich and others (Elliot, 1999; Linnenbrink & Pintrich, 2002; Pintrich, 2000, 2003) adopted a multiple-goals perspective on motivation. They crossed this mastery-performance dimension with an approach-avoid dimension according to whether students were attempting to approach or avoid the goals. Mastery-approach goals involve working on tasks to develop skills; mastery-avoid goals might involve avoiding the possibility of not meeting high standards; performance-approach goals entail a focus on outperforming others; and performance-avoid goals entail a concern with avoiding the demonstration of low ability. In any given context it is possible to hold more than one goal simultaneously. Thus, students may desire to improve their skills (mastery-approach) and outperform others to earn high grades (performance-approach).

Several investigators have suggested that goal orientation is closely related to one's theory about the nature of intelligence or ability (Dweck, 1999; Dweck & Leggett, 1988; Nicholls, 1983). Dweck proposed two theories of intelligence. Students who hold an *entity theory* believe that intelligence is relatively fixed and stable over time. Effort can help one to reach one's limit but not able to push one far beyond it. Difficulties are obstacles that can lower self-efficacy, lead to use of ineffective strategies, and cause one to quit or work halfheartedly.

In contrast, students who hold an *incremental theory* roughly equate intelligence with learning. They believe that ability can increase over time with learning and effort. If there is an upper limit on ability it is very high and should not prevent one from working harder to improve. Difficulties are challenges and can raise self-efficacy if students mobilize effort, persist, and use effective strategies.

Although there are exceptions, students holding an incremental theory of intelligence are likely to believe that learning will raise their ability and to adopt mastery goals. Students holding an entity theory may not adopt mastery goals because they believe that learning cannot raise ability much, if at all (i.e., they believe that they do not control their ability).

Research evidence offers good support for many of the predictions of goal theory (Pintrich, 2000). Students with a mastery goal orientation demonstrate better cognitive monitoring and use of learning strategies. Mastery-approach goals also relate positively to use of better (deeper) cognitive processing strategies during learning and to many motivational variables such as high self-efficacy and positive attributions. Students who adopt mastery-approach goals are able to maintain self-efficacy and perceptions of competence, even when confronted with difficult tasks (Dweck & Leggett, 1988).

To date there is little research on mastery-avoid goals, an area clearly in need of exploration. Research also is needed on how mastery goals affect perceptions of control. Support for the idea that mastery goals relate positively to perceptions of control is mainly indirect. Students who adopt mastery goals are more likely to monitor their cognition, seek ways to become aware of their learning, check their level of understanding, and use various learning strategies including those that promote learning at a deeper (rather than superficial) level (Pintrich, 2000). These and other effective learning techniques should promote control beliefs about outcomes, but research is needed.

Existing research presents mixed evidence on the relation of performance goals to motivation and self-regulated learning. Wolters, Yu, and Pintrich (1996) found that adolescents' performance-approach goals related positively to self-efficacy and use of cognitive and self-regulatory strategies; however, Kaplan and Midgley (1997) obtained no correlation between adolescents' performance-approach goals and adaptive learning strategies. Wolters (2004) showed that performance-approach goals did not relate to use of cognitive strategies. Middleton and Midgley (1997) found no relation between either performance-approach or performance-avoid goals and cognitive self-regulation. Given these conflicting findings, researchers should continue to explore the conditions under which performance-approach goals relate to achievement outcomes. Research also is needed on performance-avoid goals.

There is little developmental research on changes in goal orientations (Eccles, Wigfield, & Schiefele, 1998). Dweck's (1999) theory predicts an increase in performance goals with development, given an increasing emphasis on entity theories. Also, as children progress in school classrooms become more norm-referenced and competitive, especially with the transition from elementary to middle school or junior high. This change in contextual conditions further strengthens the prevalence of performance goals. The general decline with development in children's competence beliefs mirrors this change in goal orientation (Eccles et al., 1998).

Goal theory postulates key relations among goal orientations, theories of intelligence, perceptions of competence, and achievement outcomes. Pintrich (2000) showed how goal orientations are central components of self-regulated learning. In general, since a mastery orientation focuses on learning, students holding this goal orientation should feel a sense of control over outcomes because they adopt their strategies to help them learn and gauge their progress, which sustains motivation. Students holding a performance goal, conversely, should experience a lower sense of control over learning because their focus is outperforming others. Thus, goal theory includes both competence (e.g., self-efficacy) and control beliefs and distinguishes their effects.

Self-Determination Theory

Deci, Ryan, and colleagues developed a self-determination model of intrinsic motivation (Deci, 1980; Grolnick, Gurland, Jacob, & Decourcey, 2002; Ryan, Connell, & Deci, 1985). *Self-determination* is the process of using one's capacity to choose how to satisfy one's needs (Deci, 1980). Self-determination requires that people decide how to act on their environment.

Earlier writings by other investigators capture many of self-determination theory's central ideas. For example, de Charms (1968) discussed *personal causation*, or an individual's initiation of behavior intended to alter the environment. People strive to be causal agents and are motivated to produce changes in their environment. He distinguished origins from pawns. *Origins* are people who perceive their behaviors to be self-determined; *pawns* are those who believe their behaviors are determined by causes beyond their control. Personal causation training programs seek to engender in students a greater sense of responsibility for their actions, and thus help them become more like origins than pawns (Alderman, 1999).

Also relevant is White's (1959) *effectance motivation*, or the inner need to deal effectively with the environment. This motive is undifferentiated in infants and young children and is seen in actions such as grasping and crawling. With development the motive becomes specialized and may be seen in achievement behaviors in given school subjects.

Harter (1978) developed a model of *mastery motivation*. Whereas effectance motivation focused on success, Harter also took failure into account. Harter's model described the process whereby children internalize mastery goals and develop a self-reward system. Harter also stressed the role of socializing agents who reinforce independent mastery attempts and help children develop a sense of control and perceived competence. When socializing agents do not reinforce or openly discourage independent mastery attempts, children develop a sense of dependency, which does not facilitate perceptions of control or competence.

Self-determination theory postulates that there are three basic innate psychological needs: competence, autonomy, and relatedness. The need for competence is akin to White's (1959) general need for mastering the environment. The need for autonomy refers to the desire to experience a sense of control, agency, or autonomy in environmental interactions (i.e., an internal locus of causality). The need for relatedness (or belongingness) denotes the desire to belong to a group or groups.

Self-determination theory emphasizes the internalization of social values. Society contains many extrinsic rewards and controls that may not fit with children's desire for self-determination but which lead to desired behaviors. With development these external motivators can become part of an internalized self-regulatory system.

The self-determination view puts great emphasis on *intrinsic motivation*, or "the human need to be competent and self-determining in relation to the environment" (Deci, 1980, p. 27). Intrinsic motivation is the desire to do things for their own sake; it is distinguished from *extrinsic motivation*, or the motivation to engage in actions that lead to desired results (see also Chapter 15 of this volume). Intrinsic motivation leads people to seek and master challenges, which satisfies their needs to be competent and self-determining (Pintrich & Schunk, 2002). Intrinsic motivation decreases when people cannot be self-determining: that is, when they are not free to make choices or take responsibility for their actions. Intrinsic motivation suffers when people believe their actions are extrinsically determined, such as when they perceive their actions as means to an end (e.g., to a desired reward).

The theory postulates that intrinsic motivation is an innate human need and originates in infants as an undifferentiated need for competence and self-determination. With development the need differentiates into specific areas (e.g., academics, sports) and interactions with the environment influence its direction.

Intrinsic and extrinsic motivation may be thought of as two ends of a continuum. In the middle are behaviors that originally were extrinsically motivated but have become internalized and now are self-determined. Thus, students may want to avoid some academic activities but work on them to obtain rewards and avoid punishment. As skills develop and students believe they are becoming more competent, they perceive a sense of control and self-determination over learning. The activities become more intrinsically motivating.

Self-determination theory distinguishes competence from control beliefs. Skinner, Wellborn, and Connell (1990) identified three types of beliefs that contribute to perceived control. *Capacity beliefs* refer to beliefs about perceived capabilities with respect to ability, effort, other persons, and luck. *Strategy beliefs* are perceptions about factors that influence success in school and how what one does influences outcomes. *Control beliefs* are expectations about one's likelihood of doing well without regard to specific means.

Research has explored the relation of self-determination to intrinsic motivation (Ryan, 1993). Studies have shown that choice affects intrinsic motivation and that when persons believe they have control over their environments, they perform higher and tolerate aversive stimuli better.

Research also has explored the relations among intrinsic motivation and environmental conditions. When individuals are offered rewards for performance and view the rewards as controlling their behaviors, their intrinsic motivation for the task suffers. Other factors shown to be detrimental for intrinsic motivation are threats, deadlines, surveillance, and evaluations. Unfortunately, these factors occur commonly in schooling.

Intrinsic motivation can be enhanced by providing students with feedback indicating that they are becoming more competent and that they are developing skills. Allowing students more choices of activities also can raise intrinsic motivation. Although points in the theory need greater specification (e.g., influences on and consequences of the need to be self-determining), the literature supports many predictions of self-determination theory, especially that perceptions of competence and control are essential for intrinsic motivation.

RELEVANCE TO OTHER PROCESSES

The preceding discussion focuses on the roles of competence and control beliefs in achievement behaviors such as motivation and learning. Perceptions of competence and control also are relevant to other achievement processes. This section discusses their roles in self-regulation, metacognition, and volition.

Self-regulation

Self-regulation is a critical process in many theories of learning and achievement (Zimmerman, 2000). Self-regulation originally was studied in therapeutic contexts as a means of helping persons control dysfunctional behaviors. In recent years self-regulation has been increasingly applied to academic contexts to improve students' motivation and learning.

Various theories of self-regulation include competence judgments and control beliefs as key variables (Zimmerman & Schunk, 2001). According to Zimmerman (2000, 2001), self-regulation comprises forethought, performance/volitional control, and self-reflection phases. Self-efficacy is a key competence belief that is linked to self-regulatory control processes, such as goal setting and strategy selection. During forethought that precedes actual performance, learners assess their self-efficacy for learning. During the performance/volitional control phase, they monitor their performance and adjust strategies as needed; self-efficacy helps keep them focused and motivated. During periods of self-reflection, learners evaluate their goal progress, make causal attributions of personal control regarding that progress, and adjust their perceptions of self-efficacy accordingly. Perceived control involves not only self-efficacy beliefs but also judgments of personal effectiveness of one's self-regulatory processes. Pintrich's (2000) model of self-regulation also includes phases (forethought, planning, and activation; monitoring; control; reaction and reflection) and postulates that self-efficacy is critical throughout. Effective self-regulation requires that learners believe they can exert control over contextual factors and their cognitions, motivational processes, and behaviors.

Competence and control beliefs are integral to many theories of self-regulation, but the latter is broad in scope and includes many other processes. Most models of self-regulation include use of strategies (cognitive, motivational, behavioral), time management, self-observation and self-evaluation, environmental structuring, help seeking, and goal setting. Although perceived competence and control are important, they will not produce effective self-regulation in the absence of other self-regulatory processes.

Metacognition

Metacognition refers to the deliberate conscious control of cognitive activity (Flavell, 1985). Metacognition requires that one understands what skills, strategies, and resources are required to complete a task, as well as how and when to use those skills and strategies.

Metacognition is influenced by variables associated with learners, tasks, and strategies. Level of development is a key learner variable; with development, children are better able to understand task demands and are more cognizant of their capabilities for accomplishing them (Alexander, Carr, & Schwanenflugel, 1995). Features of the task affect learners' beliefs about what skills and strategies are required; for example, a lengthy passage with difficult words signals a different type of comprehension strategy than does a short passage with easy words. Learners' skills and knowledge of strategies and beliefs about which are useful in a given situation also affect what skills and strategies they actually employ.

As with self-regulation, competence and control beliefs come into play during metacognitive activities, but metacognition includes other processes. Learners who feel more self-efficacious about learning generally do so because they believe that they possess the skills and strategies needed to learn. Likewise, the belief that one can exercise control over one's cognitive activity is critical, but simply possessing that belief will not produce effective metacognition without the requisite knowledge, skills, and strategies.

Volition

Volition has interested psychologists for a long time. James (1890) believed that volition was the process of translating intentions into actions and had its greatest effect when different intentions competed for action. Volition executed actions by activating mental representations of them, which served as behavioral guides. Current thinking views volition as the process that mediates the relation between goals and actions and implements actions to attain goals (Corno, 1993; Kuhl, 1984). Volition helps to protect goals from being altered or discarded by applying self-regulatory activities to direct them.

Unlike theories of self-regulation that include activities that occur before, during, and after tasks, volition separates predecisional activities (e.g., goal setting, assessment of task demands) from postdecisional ones (e.g., application of strategies to attain goals). Volition comprises a set of psychological control processes that protect one's concentration and direct effort in the face of obstacles and distractions (Corno, 1993).

Competence and control beliefs are germane to volition, because to exert volitional control students must believe that they can control their focus and activities and feel competent about doing so. More research is needed in this area, because volitional researchers have focused on types of strategies to use for volitional control rather than the roles of perceived competence and control in the process (Corno, 1993, 1994; Kuhl, 1984). It seems clear, however, that like self-regulation and metacognition, volition includes a set of skills and strategies that extend beyond competence and control beliefs.

FUTURE RESEARCH AND IMPLICATIONS FOR PRACTICE

Theory and research evidence support the idea that competence and control beliefs are important achievement constructs and contribute in critical ways to learners' motivation and learning. This section suggests future research directions and discusses some implications for educational practice.

Future Research Directions

Competence and control beliefs offer many possibilities for research. Some areas that deserve further research attention are described next.

Construct Refinement and Differentiation. The preceding theories address competence or control beliefs or both. Theories that include both (e.g., social cognitive, self-determination) distinguish them, while noting that these beliefs often are related. Bandura (1997), for example, differentiates outcome expectations (control beliefs) from self-efficacy (competence beliefs) but explains how they commonly relate to one another. Efficacious people experience a greater sense of personal control over situations; people with lower self-efficacy typically believe they have less control.

It is possible, of course, to feel competent without feeling in control or vice versa. Some students, for example, may feel highly competent about learning mathematics but believe they have little control over their grades because of the teachers' capricious grading practices. Yet because the two constructs often are related, this raises the issue that they share common variance with one or more other factors (e.g., ability).

More research is needed on the structure of these constructs to include the conditions under which they show the greatest relation. Developmental research also can address the issue of whether control is a basic human need (as postulated by self-determination theory) or rather a characteristic that develops in conjunction with one's goals and societal norms. Cross-cultural research suggests that individual competence and the emphasis on personal ability are stronger in Western cultures (Fletcher & Ward, 1988; McInerney, Hinkley, Dowson, & Van Etten, 1998). Cross-cultural research should address the issue of the generality of perceived control and the cultural influences on it.

Importance of Competence and Control Beliefs. A general theme in this chapter is that competence and control beliefs make key contributions to the prediction of achievement beyond the effects of other variables. At the same time, one might question whether these beliefs really are important in school. Students typically have little control over classroom activities, teaching, assignments, and assessments. Most activities in K-12 schooling are regulated by teachers and curricula. Given the current emphasis on state and national assessments (with the rewards and sanctions that accompany them), one might ask whether it makes any difference if students feel competent or in control, so long as they can pass and ideally score high on standardized tests. Feelings of competence and control may become more important with fewer external constraints in place: for example, when students are out of school and pursuing careers.

Although research has shown motivational benefits of competence and control beliefs (Pintrich, 2000; Schunk, 1995), further research is needed to investigate the desirability of different types of beliefs. For example, are some types of competence beliefs "better" than others? What serves adolescents better in high school—competence and control beliefs for school achievement or for social interactions? It is tempting to say the former, but a case can be made that students with higher perceived social competence and control are happier, less anxious, and more motivated to perform well in school to maintain their social standing among their peers. A related research issue concerns the desirability of individual versus collective competence and control beliefs. Since much success in life after school depends on collective competence and control, researchers might address how these beliefs develop and relate to school success relative to individual beliefs.

Another issue involves the assumption that higher competence and control beliefs are desirable. We might ask whether there are conditions under which lower competence and control beliefs are more functional. Intuitively it seems important to recognize situations where one lacks competence and control. These can signal that one needs to develop skills, or perhaps abandon the situation (e.g., drop a college major when one lacks the perceived competence and control for learning and being successful). Research is needed on the conditions in which lower competence and control beliefs are more desirable than are higher beliefs.

Differentiating Activities. There is a clear need for classroom research investigating how teachers can best differentiate instruction and activities to address the various levels of ability and achievement that typically are represented in their classrooms. Even in more homogenous classrooms (e.g., honors classes) different levels of student ability and achievement will be represented. Given this diversity, how can teachers address the competence and control beliefs of the lower achievers, who may well experience lower perceptions of competence and control than others?

Conversely, the *big fish—little pond effect* postulates that students compare their abilities with those of their peers and use this social comparative information in gauging their academic self-concept (Marsh & Craven, 2002). Thus, higher achievers may actually form lower academic self-concepts when grouped with other high achievers than when most of their peers are of lower ability. This raises the research question of how teachers can strengthen the competence and control beliefs of students in honors and advanced placement classes.

It would be valuable for investigators to conduct classroom-based studies that mapped students' competence and control beliefs onto prevailing classroom norms and followed these over time to determine how students' beliefs changed as a function of changes in classroom conditions. For example, it is not unusual for high school students to be in some honors or advanced placement classes and some regular or college preparatory classes. Are students' competence and control beliefs differentiated according to class placement? Do learners feel more efficacious and in control in the regular classes than in the honors classes, or do their competence and control beliefs depend on the subject matter and other contextual factors (e.g., instructional format)? Research will help to clarify how changing conditions affect students' beliefs.

Generality/Specificity. Another important research issue concerns specificity versus generality. Domain-specific measures of competence and control beliefs predict achievement behaviors better than general measures, but we might ask to what extent competence and control beliefs developed in one context generalize to others.

Although older students often display some consistency in competence beliefs across different subject areas (Bong, 1997), we should expect less generality between school subject areas (e.g., history to math) and between teachers (e.g., one teacher who allows choices to another who generally does not) than between different levels of the same subject area (e.g., algebra 1 to algebra 2) and among similar content covered in different courses (e.g., reading comprehension in English and history). Generality might be improved when students perceive the value, or different uses for the learning. Thus, learning strategies such as organizing, outlining, and rehearsing are apt to aid learning across many domains. Students who

believe they are skillful in these activities should hold higher perceptions of competence and control for learning than students who feel less confident about using strategies effectively. More research also is needed on interventions designed to promote transfer of skills and strategies.

Diverse Student Populations. There is a need to test the influence of competence and control beliefs with diverse student populations. Much of the extant research has been conducted using predominantly White Americans. The rapidly changing demographics of many schools—especially the influx of Hispanic and Asian-American students—has resulted in changed school cultures. It is important to determine whether competence and control beliefs are central to motivation and learning for diverse populations.

Although the theories covered in this chapter postulate that competence and control are universally important, there may be differences in how they can be developed in students from different ethnic backgrounds. Some cultures value individual achievement, whereas others stress group achievement. For theoretical clarification, as well as for instructional planning, it is important to determine how competence and control beliefs can be enhanced in all students.

Instructional Technology. The rapid advent of instructional technology offers new instructional possibilities that did not exist even a few years ago. Teachers and students today have available such technologies as the Internet, Web-based learning, two-way videoconferencing, video streaming, DVDs, e-mail, chat rooms, and instant messaging.

It seems important to investigate how competence and control beliefs for learning from technology can be developed. Some students who feel competent about writing a term paper using print resources may feel less confident about using Web-based resources. They may perceive that they have less control over the process and outcome. But instructional technology also may help build students' competence and control beliefs. Students who use the Internet to complete class projects may experience a sense of control over academic learning as they navigate sites, devise effective search strategies, and decide which information to retain and which to discard.

As with other forms of learning, teachers may need to teach students how to use technology for learning: for example, by teaching Internet search and navigation skills. Such research would be relevant to the issue of transfer of competence and control beliefs to different instructional formats.

Implications for Practice

A central idea is that the development of skills, knowledge, and strategies is critical, but students also must believe that they have become more competent. Thus, most theories stress the perception of progress as central to developing competence beliefs.

There are various ways to convey progress to students. Theories that include goals as a motivational mechanism postulate that evaluating progress toward goals helps students form perceptions of competence. If a learner's goal is to develop skill (rather than to outperform others) then the student should be able to perceive progress by comparing present with prior performance. Other ways of conveying progress are through teacher feedback (e.g., "You've gotten so much better at this"), having students monitor their performances and periodically assess their progress, and giving periodic review exercises that allow students to witness how much they have learned.

Competence beliefs also can be enhanced by exposing students to social models. Although different models can teach skills, the literature suggests that perceived similarity to models is critical to building perceptions of competence (Schunk, 1995). Students who observe similar peers succeed are apt to believe that they can as well. This vicarious increase needs to be substantiated by subsequent performance success. Persuasive feedback (e.g., "You can do this") also needs performance substantiation for the enhanced perception of competence to endure.

Perceptions of competence can be increased through good curricular structuring. Ideally skill development will be sequenced such that later learning builds on prior learning. Thus, many students take a course in algebra followed by a course in geometry. If the geometry curriculum is properly structured, it will include activities that require algebraic operations, and the curriculum should include sections showing the integration with algebra. As students use their algebraic skills in geometry, their perceptions of competence in algebra are further strengthened.

Control beliefs may seem somewhat harder to address, given that in school students often have little control over the curriculum, assignments, grouping, grading, and the like. How can educators help students develop the belief that they can assess and overcome conditions that can thwart successful performance even when students perceive themselves as competent? This may require a type of instruction not often provided in schools—teaching metacognitive awareness and self-regulatory strategies. Some teachers believe that their job is to impart knowledge but not teach students how to learn. Greater success may be attained when school administrators take the lead and meet with teachers within and across departments

to structure learner activities that help to foster the belief that successful actions will lead to positive outcomes.

Another way to build control beliefs is to show students how learning certain skills and strategies can help them in multiple ways. While teaching students a reading comprehension strategy, it is useful to show how the strategy can be used with different types of reading, such as newspapers, magazines, books, and Internet sources. In mathematics, the study of ratios and proportions can be linked to scale drawings; students can determine the proportions and make the drawings.

Control beliefs can be engendered when teachers build in some unplanned class periods. Students can be allowed to lead discussions on topics relevant to the subject area and can be given opportunities to ask teachers to review topics that they are having difficulty understanding. During group projects, students can be responsible for planning the project and setting their work schedules. The key is not to have a lock-step curriculum or rigid structure for every class period.

Classroom contextual factors affect student motivation (Pintrich, 2000, 2003; see also Chapter 15 of this volume). A motivational scheme for classifying these factors is *TARGET*—task, authority, recognition, grouping, evaluation, time (Ames, 1992; Epstein, 1989). The *task* dimension involves the design of learning activities and assignments. *Authority* refers to whether students can display leadership and develop control over learning activities. *Recognition* involves the formal and informal use of praise, rewards, and incentives. The *grouping* dimension addresses student groupings for instruction and activities. *Evaluation* involves methods for monitoring and assessing student learning and for providing feedback. *Time* comprises time allotted for completing work, pace of instruction, and appropriateness of workload. Teachers who address these dimensions can help build students' competence and control beliefs: for example, by recognizing individual student progress, teaching students organizational and time management strategies, and giving students some choices in assignments.

CONCLUSION

Competence and control beliefs have been of interest in educational psychology for many years. Competence beliefs will not motivate unless students also perceive themselves in control of the learning context. Many contemporary theories distinguish these two types of self-beliefs, and research has substantiated that these beliefs are predictive of diverse outcomes such as learning, motivation, self-regulation, metacognition, and volition. Future research will further clarify their operation and suggest effective ways to develop these beliefs in students. This pedagogical goal is important because positive perceptions of competence and control are essential for learners to maximize their talents for succeeding in a changing world.

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