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AUTHOR	Schunk, Dale H.
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ABSTRACT

The theory of self-efficacy (beliefs concerning one's capabilities to learn or perform behaviors at designated levels), has developed since A. Bandura's work (1977) and continues to be applied to a variety of educational settings and grade levels. This paper addresses various issues pertaining to self-efficacy in settings involving academic learning and performance. The paper begins with a discussion of self-efficacy theory as discussed by Bandura and Schunk. Measurement issues are discussed in terms of reliability and validity of self-efficacy measures. Empirical evidence is reviewed in several areas to help distinguish the operation of self-efficacy during learning from its role in performance settings: self-efficacy for learning; self-efficacy for performing learned behaviors; self-efficacy and motivation/self-regulation; and self-efficacy and goal orientations. Finally, the accuracy of self-appraisal with regard to self-efficacy is discussed. contains 34 references. (DR/Author)

Self-Efficacy for Learning and Performance

Dale H. Schunk

School of Education

Purdue University

Presented at the annual meeting of the American Educational Research Association, New York, April 1996. Correspondence should be addressed to: Dale H. Schunk, 1446 LAEB Room 5108, Purdue University, West Lafayette, IN 47907-1446

Abstract

In this paper I discuss several conceptual and methodological issues pertaining to self-efficacy and I compare self-efficacy operation in learning settings with that in contexts involving performance of previously-learned behaviors. Self-efficacy theory and principles are reviewed, along with assessment procedures and methodological issues addressing reliability and validity. Empirical evidence then is presented in several areas that help distinguish the operation of self-efficacy during learning from its role in performance settings: self-efficacy for learning, self-efficacy for performing learned behaviors, self-efficacy and motivation/self-regulation, self-efficacy and goal orientations. The paper concludes with consideration of the issue of accuracy of self-appraisal to include suggestions for future research.

Self-Efficacy for Learning and Performance

This paper addresses various issues pertaining to self-efficacy in settings involving academic learning and performance. Self-efficacy refers to beliefs concerning one's capabilities to learn or perform behaviors at designated levels (Bandura, 1986). Since Bandura's (1977) original article, self-efficacy theory has broadened considerably and has been applied in educational settings with different grade levels (e.g., elementary, secondary, postsecondary), content domains (reading, writing, mathematics), and student ability levels (average, gifted, remedial).

Despite this increased interest in self-efficacy theory, there exists confusion over such issues as when and how individuals judge self-efficacy, whether it operates uniformly across domains, and what are acceptable ways to assess it. In addition, some original hypotheses of self-efficacy theory need revision when applied to settings involving learning. Bandura's early research investigated behaviors that snake phobics knew how to perform but did not because of such factors as anxiety, negative outcome expectations ("If I get near the snake, it will bite me"), and low self-efficacy. Some school activities involve performance of learned behaviors, but much time is spent acquiring knowledge, skills, and strategies.

In this paper I distinguish between self-efficacy operation in settings involving learning and those requiring performance of previously learned behaviors. In the next section I review self-efficacy theory, after which I discuss the assessment of self-efficacy and measurement issues. I then present empirical evidence relevant to self-efficacy operation in learning contexts, and how research findings differ in performance contexts. I conclude by discussing the issue of accuracy of self-appraisal to include suggestions for future research.

Self-Efficacy Theory

Bandura (1977, 1986) hypothesized that self-efficacy affects choice of activities, effort, and persistence. Students who hold a low sense of self-efficacy for accomplishing a task may avoid it; those who believe they are capable should participate more readily. Especially when they encounter difficulties, students who believe that they can perform well ought to work harder and persist longer than those who doubt their capabilities.

Students acquire information to appraise self-efficacy from their performances, vicarious (observational) experiences, forms of persuasion, and physiological reactions. Students' own performances offer reliable guides for assessing their self-efficacy. Successes raise self-efficacy and failures lower it, but once a strong sense of efficacy is developed a failure may not have much impact (Bandura, 1986).

Learners also acquire self-efficacy information from knowledge of others through observations of models and social comparisons. Similar others offer the best basis for comparison. Students who observe similar peers perform a task are apt to feel more efficacious because they believe that they, too, are capable of accomplishing it (Schunk, 1989). Information acquired from vicarious sources typically has a weaker effect on self-efficacy than performance-based information; the former effect can be negated by subsequent performance difficulties.

Students often receive persuasive information from teachers and parents that they are capable of learning or performing a task (e.g., "You can do this"). Positive feedback enhances self-efficacy, but this increase will be temporary if subsequent efforts turn out poorly. Students also acquire efficacy information from physiological reactions (e.g., heart rate, sweating). Symptoms signaling anxiety might be interpreted to mean that one lacks skills.

Information acquired from these sources does not automatically influence self-efficacy; rather, it is cognitively appraised (Bandura, 1986). In appraising efficacy, learners weigh and combine such factors as perceptions of their ability, difficulty of the task, effort expended, external assistance received, number and pattern of successes and failure, perceived similarity to models, and persuader credibility (Schunk, 1989).

Self-efficacy is not the only influence on achievement behavior; also important are ability, knowledge, skill, outcome expectations, and perceived value of learning or other outcomes. High self-efficacy will not produce competent performances when requisite ability, knowledge, or skill is lacking. A sense of self-efficacy for learning is beneficial because it motivates individuals to improve their competence. Outcome expectations, or beliefs concerning the probable outcomes of actions, are important because students engage in activities that they believe will result in positive outcomes. Although outcome expectations and self-efficacy often are related (e.g., efficacious learners expect, and usually receive, positive outcomes for their actions), there is no automatic relation between them. Students may expect positive outcomes if they perform well on a test but may doubt their capabilities to attain a high score. Value of learning or outcomes refers to the perceived importance of learning or attaining designated outcomes. Perceived value affects behavior because students are motivated to learn important material and attain satisfying outcomes.

The hypothesized operation of self-efficacy during academic skill learning has been described by Schunk (1989, 1995). At the start of a learning activity students differ in their self-efficacy for acquiring knowledge and skills as a result of prior experiences, social supports, and such personal qualities as abilities and attitudes. As they engage in activities their self-efficacy is affected by personal influences (e.g., goal setting, information processing) and by situational factors (e.g., rewards, feedback). These factors serve as cues from which they derive information on how well they are performing. Motivation and self-efficacy are enhanced when students perceive they are making progress toward their goals and becoming more competent. Lack of success or slow progress will not necessarily lower self-efficacy and motivation if students believe they can perform better by adjusting their approach (e.g., expend more effort, use better strategies) (Schunk, 1989).

Assessment of Self-Efficacy

In Bandura's early studies with snake phobics (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977), subjects completed an efficacy assessment and were given a behavioral avoidance test comprising increasingly more threatening interactions with a boa constrictor. The hierarchy included such tasks as looking at the snake in a cage from a distance, placing a bare hand in the cage, holding the snake with bare hands, and tolerating the snake in one's lap.

For the efficacy assessment, subjects designated those tasks they believed they could perform. For each task designated, they rated the strength of their certainty on a scale ranging from high uncertainty (10) to complete certitude (100). Subjects also judged efficacy for coping successfully with an unfamiliar snake to assess generalization of self-efficacy.

In much of the discussion that follows I refer to my research on self-efficacy, although other researchers have employed similar procedures. The anxiety hierarchies developed by Bandura and colleagues are useful in therapeutic contexts but modifications are needed for academic settings. I have conducted self-efficacy research in mathematics (long division, subtraction, fractions) and literacy (writing paragraphs, reading comprehension, listening comprehension). Within the domain, tasks were selected and ordered in difficulty. For example, addition of fractions problems can be ordered based on the number of terms to be added, whether one must find a lowest common denominator, the size of the lowest common denominator, and whether the answer must be reduced. Reading comprehension questions can be ordered based on the length and vocabulary level of the reading passage and the type of skill required by the question (e.g., identifying main ideas, comprehending details). Sample self-efficacy measures are shown in Table 1.

Insert Table 1 about here

I also altered the efficacy judgment procedure. In Bandura's research with phobics, subjects were presented with descriptions of tasks and judged their certainty of performing each task. With cognitive skills, different tasks may tap the same skill. Thus, the problems **53 - 27** and **64 - 36** tap the skill of regrouping once in two-column problems. For each efficacy judgment, students are presented with sample problems, questions, or tasks, for a brief time (e.g., 5 seconds) that is long enough to assess difficulty but too short to mentally perform the operations. Subjects judge their certainty for correctly solving problems, answering questions, performing paragraph-writing tasks, and so forth, of that type (i.e., comparable in difficulty, length, and format). They do not judge whether they can solve any particular problem, perform a specific paragraph-writing task, or answer a given question. Students make only one efficacy judgment for each type of task portrayed. Early pilot work showed that children found Bandura's two-step efficacy judgment procedure confusing.

This type of assessment addresses efficacy for performing activities. It is possible to measure self-efficacy for learning (improvement). Participants judge their capabilities for learning to solve types of problems, write types of paragraphs, or answer types of questions, rather than their certainty for being able to successfully perform those tasks. Self-efficacy for learning is highly relevant to schooling and is hypothesized to be an important process involved in motivation and learning (Schunk, 1989). In assessing learning capabilities, students may take into account such factors as what they will need to learn, what knowledge and skills are prerequisites for the new learning, how well they remember the prerequisite information, how easily they have learned similar skills in the past, how well they can attend to the instruction and rehearse material to be learned, how much time they will have to learn, and how skillfully they can monitor their level of learning. Students who feel more efficacious about learning ought to engage in such activities as attending to instruction, rehearsing material to be learned, and monitoring level of understanding. In turn, as students perceive their progress in acquiring skills and knowledge, their self-efficacy and motivation for further learning are enhanced.

Measurement Issues

Reliability

Reliabilities of the self-efficacy measures have been determined in various ways. In some studies, internal consistency coefficients have been computed. These generally have been high (range = .62 - .94) (Pajares & Kranzler, 1995; Pajares & Miller, 1994, 1995; Schunk & Swartz, 1993; Shell, Colvin, & Bruning, 1995; Shell, Murphy, & Bruning, 1989).

Test-retest reliability coefficients have been determined by administering the self-efficacy test to students not participating in the actual study on two occasions separated by several days to preclude item recall. Some sample reliability coefficients are as follows: division of whole numbers, r = .85 (Schunk & Gunn, 1986); subtraction of whole numbers, r = .82 (Bandura & Schunk, 1981); addition and subtraction of fractions, r = .79 (Schunk, Hanson, & Cox, 1987); reading comprehension of main ideas, r = .82 (Schunk & Rice, 1993); writing of paragraphs, r = .92 (Schunk & Swartz, 1993). These correlations support the idea that self-efficacy tests employed in research are reliable.

An issue relevant to reliability is Kirsch's (1980; Kirsch & Wickless, 1983) contention that self-efficacy tests may produce artificially high reliabilities because they constitute Guttman scales. A Guttman scale satisfies these criteria: (a) Items are ordered in level of difficulty; (b) Each item can be scored as a pass or fail; (c) The first failure implies that the respondent passed all preceding items and failed all subsequent ones. The number of items that the respondent passes determines the pattern of responses, so if a respondent passes 10 items on a 15-item test then the respondent passed the first 10 items. Use of a test-retest reliability procedure with Guttman scales is inappropriate because it produces unnaturally high coefficients.

Self-efficacy tests often satisfy the first two criteria but not the third. Items typically are ordered in terms of objective difficulty. In some studies a point is established that separates high from low efficacy judgments (Bandura & Schunk, 1981; Pajares & Miller, 1994; Schunk, 1981). The third criterion assumes a perfectly ordered task hierarchy. Although tasks are ordered based on objective difficulty, students often do not perceive them the same way. It is not uncommon for respondents to judge themselves more capable of performing a task higher on the anxiety hierarchy (e.g., tolerating a snake in their laps) than performing a task lower on the hierarchy (e.g., holding it in front of their faces), because the latter task places the reptile closer to the face.

With cognitive skills, disparities between objective difficulty and students' efficacv judgments occur because they may not fully understand what skills are required to accomplish the task. For example, many children who lack subtraction with regrouping skills judge self-efficacy higher for solving problems of the type **9003 - 6571** than for solving problems of the type **968243 - 657121**. They base their judgment on the belief that one simply subtracts the smaller number from the larger one in each column. Thus, the former appears easier because it has fewer columns, although it actually is much more difficult. In short, evidence does not fully support the idea that self-efficacy tests constitute Guttman scales.

<u>Validity</u>

Types of validity are content, criterion (predictive), and construct. With respect to <u>content validity</u>, self-efficacy tests often are developed in conjunction with an instructional program that students receive or a curriculum unit. I typically base 50 - 70 percent of the efficacy items on material in the program/unit. The remaining items are slightly more complex and are included to assess generalization. In subtraction, for example, students might receive instruction on regrouping in two columns, and some self-efficacy judgments require regrouping in three columns.

<u>Criterion validity</u> of self-efficacy can be determined by relating it to students' achievement behaviors. Pretest self-efficacy typically shows poor prediction since it usually is low and skills are absent or poorly developed. More variability--and therefore better prediction--is found in measures of self-efficacy for learning, which relates positively to subsequent success during instruction, and with posttest self-efficacy, which correlates positively with posttest skill (Schunk, 1989, 1995). This issue is discussed further in the Empirical Evidence section.

<u>Construct validity</u> has been assessed in various ways. We would expect that self-efficacy would relate to factors assumed to influence it. Thus, <u>attributions</u> (perceived causes of outcomes) are hypothesized to be important influences on self-efficacy (Schunk, 1989). Higher self-efficacy should be associated with greater emphasis on ability and effort as causes of success and with lower judgments of task difficulty. This pattern of significant correlations has been obtained (Schunk, 1981; Schunk & Cox, 1986). Consistent with prediction, we also have found that as skills develop, the correlation between self-efficacy and ability attributions increases (Schunk & Gunn, 1986).

Given that self-efficacy typically is assessed within domains, we should expect that it would correlate higher with other domain-related measures than with measures of general cognitive functioning. Schunk (1981) found significant and positive correlations between students' self-efficacy for solving long-division problems and their attitudes toward division. Self-efficacy also correlated positively with observers' ratings of students' persistence solving arithmetic problems and their effort expenditure. Conversely, a nonsignificant correlation was obtained between self-efficacy and students' <u>locus of control</u>, or the extent that they took personal responsibility for their academic successes and failures. The latter is a general measure that presumably operates in many academic domains. The correlations between self-efficacy and standardized measures of mathematical competence--also more generic in nature--were nonsignificant. Pajares and Kranzler (1995) found that mathematics self-efficacy correlated more strongly with mathematics performance than did general mental ability.

Empirical Evidence

In this section I present empirical evidence relevant to self-efficacy operation in learning settings. I focus on academic learning, although the points are equally pertinent to other types of learning (e.g., motor skills) (Schunk, 1995). Rather than covering a wide range of issues, I discuss a subset that distinguishes the operation of self-efficacy during learning and its relation to other variables from its role in situations involving performance of previously learned skills. Collectively, these points suggest revisions to self-efficacy theory.

Self-Efficacy for Learning

Bandura's original writings (Bandura, 1977; Bandura & Adams, 1977; Bandura et al., 1977) made no mention of self-efficacy for learning; rather, self-efficacy referred to performance of behaviors. In academic settings, however, students often possess little or no skill, so self-efficacy for performing behaviors is a meaningless index because it is at or near zero. Conversely, students differ in self-efficacy for learning, which is affected by their perceptions of learning progress as they engage in the task (Schunk, 1989, 1995).

Self-efficacy for learning is assessed prior to students' receiving instruction. They judge their capabilities for learning to perform the skills necessary to accomplish the task (e.g., writing clear topic sentences, correctly solving problems). In a study by Schunk and Hanson (1985), children who had experienced difficulties learning subtraction with regrouping skills observed videotapes portraying one or more peer (student) models learning to solve problems, after which they judged self-efficacy for learning. This measure was related to subsequent problem solving by children during independent practice time during lessons (a measure of motivation). In this study and in a follow-up (Schunk et al., 1987), self-efficacy for learning was significantly and positively correlated with motivation. More rapid problem solving was not attained at the expense of accuracy; similar results were obtained using the proportion of problems that students solved correctly. Self-efficacy for learning also related positively and significantly to posttest self-efficacy and skill.

Self-Efficacy for Performing Learned Behaviors

I stated earlier that the prediction of pretest self-efficacy typically is inadequate because students lack skill and judge efficacy low. When skill is lacking, no amount of self-efficacy will produce a competent performance. This is often the case in settings involving learning. In contrast, when skills are established, self-efficacy refers to perceived capabilities to perform learned actions. Self-efficacy may vary not as a function of actual skill but rather due to perceived capabilities to overcome obstacles, cope with anxiety, and so forth.

In learning settings, there is greater variability in posttest measures (self-efficacy, skill) that are assessed following instruction. The relation of these measures has been determined in various content domains: mathematical long division, subtraction with regrouping, addition and subtraction of fractions, listening and reading comprehension, paragraph writing. Correlations have ranged from r = .27 - .84.

Multiple regression has been used to determine the percentage of variability in skillful performance accounted for by self-efficacy (Schunk, 1981, 1982; Schunk & Gunn, 1986). In these analyses, self-efficacy has accounted for a significant increment in the variability of posttest skill (R^2 values range from .17 - .24). Schunk (1981) used path analysis to test how well a causal model of achievement reproduced the original correlation matrix comprising instructional treatment, along with posttest self-efficacy, persistence, and skill. The most parsimonious model that reproduced the data showed that treatment exerted both a direct effect on skill as well as an indirect effect through persistence and self-efficacy, the effect of treatment on persistence operated indirectly through self-efficacy, and self-efficacy influenced skill and persistence.

Bandura's (1977, 1986) contention that higher self-efficacy leads to greater persistence must be modified when applied to learning settings. We have explored the relation between posttest self-efficacy and persistence (time spent working on academic tasks). Studies have yielded mixed results: $r = .30$ (Schunk, 1981); $r = -.29$ (Schunk & Hanson, 1985); $r = -.30$ (Schunk, 1983a). Schunk (1983b) found a nonsignificant correlation close to zero.

The relation of self-efficacy to persistence in learning settings may depend on many factors. Many students persist on tasks not because of self-efficacy but because the teacher keeps them working. Self-efficacy is a poor predictor when students do not have the choice to work on tasks. Persistence also depends on levels of task difficulty and skill development. When mathematical skills and self-efficacy are low, students may spend some time on problems but not solve them. Alternatively, they may give up readily. As skills and self-efficacy develop, students may spend an increased amount of time solving problems, but eventually they spend less time on problems but solve more of them correctly. Persistence may bear the best relation to self-efficacy when the task is sufficiently difficult such that students with lower self-efficacy will quit whereas those who feel more efficacious will persevere for varying time periods because they believe they can master it.

In similar fashion, choice of activities may not be a useful outcome of self-efficacy when activities have previously been learned. In school, many students do not have the choice to work on activities; rather, teachers tell them what to do. Choice is meaningful only when students can make choices (e.g., during free time).

Self-Efficacy and Motivation/Self-Regulation

Self-efficacy should influence student motivation and self-regulatory efforts during learning. In models of motivation and self-regulation (Schunk, 1989;

Zimmerman, 1989), self-efficacy bears a reciprocal relation to these outcomes. This is consistent with Bandura's (1986) triadic reciprocality concept wherein behaviors, personal and environmental factors, interact with and affect one another. Initial self-efficacy for learning depends on prior experiences, personal attributes (e.g., abilities, skills), and environmental/social supports. As students work on a task they derive cues that signal how well they are learning and that they use to appraise their efficacy for continued learning. These cues include performance outcomes and patterns of successes and failures, feedback, rewards, observations of models, credibility of persuaders, and bodily symptoms. Self-efficacy for learning sustains motivation and leads students to use effective self-regulatory strategies.

Unlike performance contexts, where skills remain unchanged or undergo gradual refinement (Ericsson, Krampe, & Tesch-Romer, 1993) but self-efficacy may develop due to use of effective task and coping strategies, both skills and self-efficacy are changing when learning takes place. It is imperative that learning task conditions convey clear information to students concerning their progress, which builds self-efficacy. The perception of little progress will not necessarily diminish self-efficacy if students believe they can perform better by using a different strategy (Schunk, 1995).

Research substantiates the critical role of task factors. For example, close-at-hand proximal goals lead to higher self-efficacy, motivation, and skillful performance, compared with temporally distant goals (Bandura & Schunk, 1981). Proximal goals are hypothesized to convey clearer information to students concerning their learning progress. Ability attributional feedback given for rapid or early learning enhances self-efficacy and skillful performance more than does effort feedback (Schunk, 1984). The perception of lower initial effort required to learn can lead students to believe they are capable of further learning. For difficult tasks, high initial effort is facilitative, but as skills develop students should expend less effort to perform well. Other research shows that observing peer models acquire skills raises self-efficacy for learning more than does observing a teacher model (Schunk & Hanson, 1985). Students are apt to believe that if peers can learn, they can as well. Skillful performance by a competent adult teacher does not guarantee that students will learn. Although proximal goals, attributional feedback, and peer models, also are useful in performance contexts, they play a critical role in building self-efficacy for learning.

Self-Efficacy and Goal Orientations

An important new area of motivation research involves exploring relations among goal (motivational) orientations and achievement outcomes. Goal orientations are dispositional qualities of persons that reflect their goals and beliefs about factors influencing success (Ames, 1992). Of particular interest are task and ego orientations. A task orientation refers to the goal of learning or improving one's skills (Nicholls, 1983). Task-oriented persons equate learning with skill, believe that effort promotes skill acquisition, and are likely to compare their present with their past performance to determine progress. An ego orientation refers to the goal of performing better than others and looking competent. Ego-oriented students feel that learning indicates one's competence, believe that effort can raise performance only to the level set by ability, and often socially compare their performances with those of others to determine relative standing.

Research supports the point that self-efficacy relates to motivational orientations. Meece, Blumenfeld, and Hoyle (1988) showed that students with task-mastery goals report more active cognitive engagement with material to be learned and that perceived competence (a measure analogous to self-efficacy) relates positively to motivation and task-mastery goals. Schunk and Swartz (1993) found that providing children with a process goal of learning to use a strategy and feedback on their progress increases task orientation and decreases ego orientation, and that self-efficacy correlates positively with task orientation and negatively with ego orientation.

Schunk (in press) conducted two studies investigating how goals and self-evaluation affect motivation and achievement outcomes. Children received instruction and practice on fractions over sessions and either a (learning) goal of learning how to solve problems or a (performance) goal of merely solving them. In both studies learning goals led to higher task orientation and lower ego orientation than did performance goals, self-evaluation with either goal raised task orientation and lowered ego orientation, and self-efficacy correlated positively with task orientation and negatively with ego orientation.

The effects of goal orientations may differ in learning and performance contexts (Elliott & Dweck, 1988). A task orientation helps students focus on what is required to learn the task and on how well they are making progress in learning, whereas an ego orientation might lead them to focus more on how well they are doing relative to others (Schunk, 1995). The latter type of social comparisons might enhance performance when skills are well established, but the preceding research shows that a task orientation is useful in learning settings. When learning is involved, self-efficacy might relate positively to task orientation and negatively to ego orientation; however, in performance contexts type of orientation might relate less systematically to self-efficacy. When students already know what to do they could be highly motivated by rewards and social comparisons.

These predictions might depend on how students viewed their ability. Wood and Bandura (1989) had adults engage in a managerial decision-making task and told them that decision-making ability was fixed (reflected their basic cognitive capabilities) or incremental (developed through practice). These ability conceptions often are associated with ego and task orientations, respectively (Dweck & Leggett, 1988; Nicholls, 1983). Incremental subjects maintained high self-efficacy, set challenging goals, applied rules efficiently, and performed better; entity subjects showed a decline in self-efficacy. Elliott and Dweck (1988) showed that children given a learning goal chose challenging tasks and persisted in applying effective strategies, regardless of whether they viewed their ability as high or low. Children given a performance goal who perceived ability as high used effective task strategies; those who perceived ability as low were less likely to use these strategies. Additional research can clarify the relation of self-efficacy to goal orientations in learning and performance settings.

Accuracy of Self-Appraisal

A final area in which self-efficacy theory may need modification involves the issue of the accuracy with which self-efficacy predicts subsequent performance. In Bandura's early snake phobic research (Bandura & Adams, 1977; Bandura et al., 1977), subjects judged whether they could perform tasks and then were given the opportunity to perform them. Efficacy judgments were related to performance at the level of individual tasks. This research yielded very high percentages of agreement between efficacy and actual behavior (range = 84 - 92 percent).

In two studies conducted as students were acquiring arithmetic skills (Bandura & Schunk, 1981; Schunk, 1981), the correspondence between self-efficacy and skill was determined at the level of individual tasks. Each posttest efficacy judgment was compared with the subsequent accuracy score on the problem of comparable form and difficulty. Correspondence was defined as students judging themselves capable/incapable of solving that type of problem on the efficacy test (judgment higher/lower than the scale midpoint) and then solving/not solving the comparable problem on the skill test. Percentages of agreement ranged from 51 - 85 percent. Pajares and Miller (1994) found that few students accurately assessed efficacy for the entire skill test; most students displayed some overconfidence.

The fact that self-efficacy does not correspond as well to behavior in learning settings than it does in performance contexts highlights a critical difference. In performance settings, students are aware that they possess the skill to perform the behaviors. Actual performance depends more on nonskill factors such as self-efficacy, motivation, anxiety, and perceived incentives.

In contrast, it is easier to misjudge self-efficacy in learning settings. Students often do not fully understand the complexity of operations involved. Fraction problems such as 1/2 + 1/4 look deceptively easy to the uninitiated, who might add numerators and denominators (2/6). Perceived low task difficulty leads to overconfidence. Another point is that in school most children come to expect that they will succeed on tasks since they believe that teachers will not give them work they cannot accomplish. They may be reluctant to judge efficacy low if they believe that they will be given tasks they can perform successfully. There also is the possibility that students judge efficacy high in learning settings because they do not want to appear incapable of learning or performing well (analogous to the ego orientation). There are ways to minimize this evaluative concern in research (e.g., have students make judgments privately, do not show their work to others, explain that they are not expected to know how to do all the work, answer honestly), but some misjudgment still is possible.

Future research can examine differences in accuracy of self-appraisal across different types of contexts. Accuracy is desired because gross misjudgments in either direction negatively affect performance and motivation. Students who overestimate what they can do are apt to become discouraged through frequent failures; those who underestimate their capabilities may not attempt tasks and thereby preclude skill development. At the same time, mild overestimation of capabilities--especially those involving learning--can be facilitative and help motivate efforts to learn (Bandura, 1986). In this regard, self-efficacy for learning may be a good predictor of actual learning since it taps students' beliefs about their learning capabilities, which can influence academic motivation and learning.

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Table 1

Sample Self-Efficacy Items

Scale

10	20	30	40	50	60	70	80	90	100
Not Sure			Maybe			Pretty Sure		Really Sure	

Reading Comprehension

Sample Passage and Question

The gorilla's life is not always quiet. Sometimes the father gorilla does a very strange thing. In a way it is a kind of dance. First he makes a soft hooting noise. Then he picks a leaf and holds it in his lips. He stands up high on his back legs. He hoots faster. He throws leaves in the air. He hits his great chest so hard the noise can be heard far away. He kicks one leg in the air. He runs sideways. He rips leaves and branches off trees. Then, to end it all, he hits the ground with his mighty hand.

What is this passage mostly about?

Paragraph Writing

Sample Item - Descriptive Paragraph

Students are told that there are five major tasks we do when we write paragraphs: think of ideas about the topic, decide on the main idea, plan the paragraph, write the topic sentence, write the other sentences. They are given examples of these. They then are informed about a descriptive paragraph (i.e., paragraph that describes or tells about someone or something), and are read a sample paragraph. To assess efficacy they are asked to think about a type of descriptive paragraph (e.g., what they see when they look out the front door of where they live). They then judge efficacy for performing the five tasks for a descriptive paragraph. This procedure is repeated for the other types of paragraphs assessed (e.g., informative, narrative story, narrative description).

Fraction Problems

<u>Sample Items</u>

3/7 + 3/7 = ?	1/4 + 1/4 = ?
5/6 + 4/6 = ?	3/4 + 2/4 = ?
5/8 + 1/5 = ?	1/7 + 5/6 = ?
1/2 + 1/2 + 2/8 = ?	2/6 + 5/18 + 1/12 = ?
5/6 - 4/6 = ?	4/5 - 1/5 = ?
7/12 - 2/6 = ?	7/8 - 2/4 = ?