SOCIAL-SELF INTERACTION AND ACHIEVEMENT BEHAVIOR

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Abstract:
This article describes a dynamic model of achievement in which social influences are internalized and used self-regulatively by learners. The conceptual focus is social cognitive theory with emphasis on triadic reciprocality and phases of self-regulatory development. Social (instructional) factors, self (personal) influences, and achievement outcomes (behaviors) reciprocally interact during learning; the direction and strength of reciprocal influence will vary due to level of skill acquisition and phase of self-regulatory development. Research is summarized on social modeling, self-verbalization, and goals with progress feedback; each involves social transmittal of skills and strategies and a means for learner internalization. The social cognitive perspective is contrasted with other theoretical views that highlight the role of the social environment in learning. This article concludes with suggestions for future research.

Article:
The critical influence of the social environment on learning is well established in theory and research, but this conception of unidimensional influence provides an incomplete picture of the relation between the social environment and achievement behavior. Although it is true that many influences on achievement beliefs and behaviors originate in the social environment, these influences are not passively received but rather are transformed by learners into personal self-regulatory influences. With increased skill acquisition, this unidimensional social-to-self transformation process becomes a bidirectional interactive process as learners alter and adjust their social environments to further enhance their achievement.

The key element in this social-to-self transformation is learners' internalization of information acquired from the social environment. By internalization I mean under the learner's self-regulatory control. This contrasts with noninternalized social information that is under the control of others in the learner's social environment. Internalized information is mentally represented visually as images and verbally as meanings, rules, instructions, and so forth. Although learning can occur without internalization (e.g., when teachers tell students what to do), it is imperative for long-term skill improvement and transfer beyond the initial learning setting. The net result of such internalization is a set of personal or self influences that learners employ self-regulatively to sustain motivation and learning.

In this article, I present a coherent theoretical picture of this social-self interactive process in which social influences are internalized and used self-regulatively by learners. I summarize empirical evidence from various lines of research that support the efficacy of social-self interaction as a positive influence on achievement behaviors. Some related theoretical views that also stress internalization of socially transmitted information are described and contrasted with this social cognitive perspective. I conclude by suggesting future research directions.

THEORETICAL BACKGROUND
My conceptual focus is social cognitive theory. A model of social-self interaction in achievement settings is presented. First, however, the notions of triadic reciprocality (Bandura, 1986) and phases of self-regulatory

development (Schunk & Zimmerman, 1997; Zimmerman & Bonner, in press), on which the model is based, are discussed.

Triadic Reciprocality

According to Bandura (1986), human functioning comprises a series of reciprocal interactions between behavioral, environmental, and personal variables (e.g., cognitions and affects). A key personal variable is self-efficacy, or perceived capabilities for learning or performing tasks at designated levels. Self-efficacy can influence such achievement behaviors as choice of tasks, effort, persistence, and performance. Compared with learners who doubt their capabilities, efficacious students are more likely to engage in tasks, expend effort, persist to overcome difficulties, and perform at higher levels (Bandura, 1997; Pajares, 1996; Schunk, 1996; Zimmerman, 1995). Behaviors also influence personal variables. As students work on tasks they mentally note their progress, which conveys to them that they are capable of learning and raising their self-efficacy.

The reciprocal influence between environments and behaviors can be seen when teachers introduce an unusual topic or novel event (environmental variable), to which students direct their attention (behavior). Behaviors can affect the environment. Thus, if students act puzzled by a teacher's explanation (behavior), then the teacher may reteach the material (environmental variable).

Personal variables and environments also affect one another. When students with high self-efficacy try to complete an academic task in a distracting environment they may increase their concentration (personal variable) to make the environment less distracting. This type of personal influence has been described as volitional control (Corno & Kanfer, 1993) and as proximal resource allocation (Kanfer & Ackerman, 1989). The influence of environmental variables on personal variables is seen when a teacher gives students verbal feedback (environmental variable) such as, "You're really improving," which raises their self-efficacy (personal variable).

Phases of Self-Regulatory Development

Zimmerman and his colleagues formulated a social cognitive model of the development of self-regulatory competence (Schunk & Zimmerman, 1996, 1997; Zimmerman, 2000; Zimmerman & Bonner, in press). As shown in Table 1, the model predicts that academic competence develops initially from social sources and subsequently shifts to self-sources in a series of levels. Although there may be some overlap, the first two levels (observational and emulative) rely primarily on social factors, whereas by the second two levels (self-controlled, self-regulated) the source of influence has shifted to the learner.

TABLE 1
Social Cognitive Model of the Development of
Self-Regulatory Competence

Level of Development	Social Influences	Self Influences
Observational	Models Verbal description	
Emulative	Social guidance Feedback	
Self-controlled		Internal standards Self-reinforcement
Self-regulated		Self-regulatory processes Self-efficacy beliefs

Novice learners acquire rudimentary skills and strategies from social modeling, teaching, task structuring, and encouragement. At this observational level, students learn the major features of strategies but cannot necessarily perform them. As Bandura and others have shown, what is learned vicariously is not necessarily performed, or if performed, may be done so incompletely (Bandura, 1977; Rosenthal & Bandura, 1978; Schunk, 1987). Learners require practice with feedback to begin to develop the skills. At this level, information is not internalized.

An emulative level is attained when the learner's performance approximates the general form of the model's. The learner is not copying the actions of the model but rather emulates the model's general pattern or style. The

major difference between the first two levels is that observational learning involves acquisition only at an observational level whereas at the emulative level the learner actually can perform the skill or strategy. The learning is not internalized because the learner requires external assistance--such as a modeled demonstration-- to perform the skill or strategy.

These two sources of skill learning are primarily social because students require exposure to real or symbolic models for observational and emulative learning. Internalization has begun, but this process increases with the shift to the third and fourth sources that reside primarily within the learner.

The hallmark of the third, or self-controlled level, is the capability of learners to use the skill or strategy independently when performing related tasks. During this phase the skill or strategy becomes internalized, although the learner's internal representation is patterned after the model's performance (i.e., covert images and verbal meanings). Learners have not yet developed an independent representation or begun to internally modify the performance based on what they believe will be most effective.

A higher level of functioning is needed to perform effectively in complex situations. The final self-regulated level allows learners to adapt their skills and strategies systematically as personal and contextual conditions change. At this level, learners can initiate use of skills and strategies, incorporate adjustments based on features of the situation, and maintain their motivation through personal goals and a sense of self-efficacy for attaining them.

In summary, learning begins with observational acquisition of knowledge about a skill or strategy, and proceeds through its emulative use, internalized self-control, and self-regulated adaptation. Triadic reciprocality is evident throughout the phases. Social factors in the environment influence behaviors and personal factors, which in turn affect the social environment. In the early stages of learning, teachers who observe problems in learners' performances of skills offer correction, learners who do not fully comprehend how to perform a skill or strategy at the emulative level may ask teachers for assistance, and learners' performances affect their self-efficacy. At more advanced levels, learners mentally and overtly practice skills and seek out teachers, coaches, and tutors, to help them refine their skills (Zimmerman, 1998).

This latter example also shows that social influences do not disappear with advancing skill acquisition. Although self-controlled and self-regulated learners use social sources less frequently, they nonetheless continue to rely on them (Zimmerman, 2000). Zimmerman (1998) offered several examples of the self-regulated use of social sources by persons in academic, athletic, and artistic domains. In short, self-regulation does not mean social independence.

This is not a stage model and learners may not necessarily progress in this fashion. Students without access to relevant models may nonetheless learn on their own. For example, one may learn to play a musical instrument by ear or develop a unique but successful method for solving mathematical word problems. Despite the frequent success of self-teaching, it fails to garner the potential benefits of the social environment on learning. Additionally, unless learners possess good self-regulatory skills, failing to use the social environment may severely limit their overall skill levels.

Social-Self Interaction in Achievement Settings
A model incorporating the preceding ideas is portrayed in Figure 1. This model includes Bandura's (1986) triadic reciprocality variables as shown in the figure. Social factors can affect many personal variables, such as learners' goals, self-efficacy, outcome expectations (beliefs about the consequences of one's actions), attributions (perceived causes of outcomes), self-evaluations of learning progress, and self-regulatory processes. In turn, personal factors can affect social environments, as when learners decide they need additional teaching on a skill and seek out a qualified instructor.

Social Influences	Achievement Outcomes
(Environmental Variables)	(Behaviors)
Models	Goal Progress
Instruction	Motivation
Feedback	Learning

Self-Influences

(Personal Variables)

Goals

Self-Efficacy

Outcome Expectations

Attributions

Progress Self-Evaluations
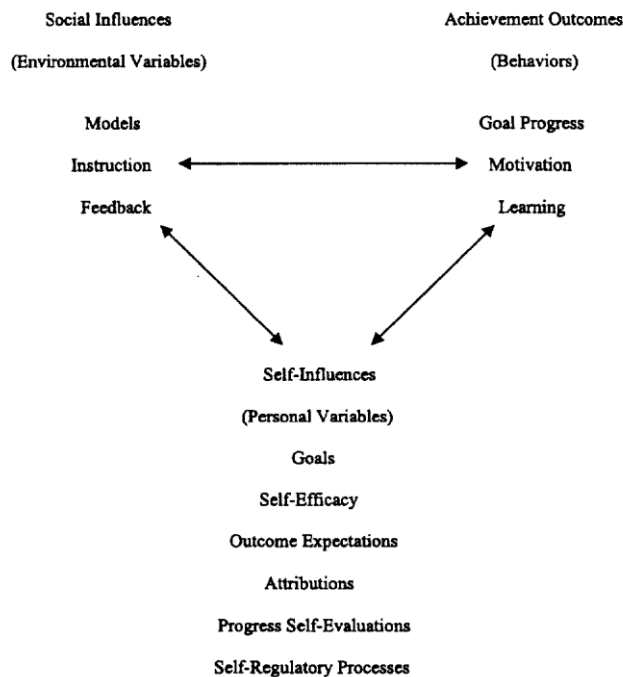
Self-Regulatory Processes

FIGURE 1   Social-self interaction in achievement settings.

Achievement outcomes such as goal progress, motivational behaviors (choice of activities, effort, persistence), and learning are affected by social and self influences. In turn, learner behaviors influence these factors. Thus, as students work on tasks they evaluate their learning progress. Positive perceptions of progress substantiate their self-efficacy for learning, which in turn sustains motivation and learning. As teachers observe students' progress they model corrective instruction based on students' demonstrated skills.

This is not a cognition-only model (Pintrich & Schrauben, 1992) because it incorporates several motivational elements. The model is reciprocally interactive, although the directions of influence will change as a function of such factors as level of skill acquisition and degree of learner self-regulation. Social factors predominate in the early stages of learning because learners take in much information from the social environment. As learners internalize skills and strategies they adapt them in unique ways. Learners increasingly structure their social environments to make them more conducive to skill improvement.

RESEARCH EVIDENCE
To support this model, evidence is presented from three lines of research: social modeling, self-verbalization, and goals with progress feedback. Each of these areas involves the social transmittal of skills and strategies to learners. This review is limited and is intended only to be illustrative. Other potentially relevant work (e.g., attribution retraining and guided teaching or facilitation) is discussed elsewhere (Schunk, 1998; Schunk & Zimmerman, 1996, 1997). I have selected research studies that include a means whereby learners could internalize what they were learning, the assessment of achievement outcomes, and opportunities for self-regulation during learning.

Social Modeling
There is extensive research literature on observational learning through modeling (Bandura, 1986; Rosenthal & Zimmerman, 1978; Schunk, 1987). To learn observationally, students must attend to a model, mentally code the information for retention, be capable of producing the modeled action, and be motivated to do so.

Social modeling is informative and motivating. Models convey the functional value of behavior, or whether it results in success, failure, reward, punishment, and the like. Modeled behaviors that lead to rewarding outcomes are more likely to be performed than behaviors that result in punishment (Bandura, 1977). Models also motivate observers. By observing modeled behaviors and their consequences, people formulate outcome expectations

about the likely outcomes of actions. Observers are likely to act in ways they believe will result in positive outcomes.

The effects of modeled consequences on observers depend partly on self-efficacy. Observing others succeed can raise observers' self-efficacy and motivate them because they may believe that if others can succeed they can as well. When models experience difficulty, observers may doubt their capabilities and may not be motivated to attempt the task.

Perceived similarity between model and observer is an important source of information and motivation (Schunk, 1987). In general, the more alike observers are to models, the greater the probability that similar actions by observers are socially appropriate and will produce comparable results (Zimmerman & Koussa, 1975). Similarity also is a cue used in appraising self-efficacy. Observing similar others succeed raises self-efficacy; observing similar others have difficulty can lower it.

Modeling studies provide evidence on how information conveyed socially can be internalized by students and used self-regulatively to produce greater learning. Although models are important sources for the initial observational phase of skill acquisition, they are useful for learners with varying levels of skills. In addition to their benefits on learning, models convey that observers can succeed if they follow the same sequence. Students who believe they know how to perform a skill or strategy feel more efficacious and motivated to succeed (Schunk, 1987).

In an early study I found benefits of cognitive modeling on children's mathematical skill learning (Schunk, 1981). Cognitive modeling incorporates modeled explanations and demonstrations with verbalizations of the model's thoughts and reasons for performing the actions (Meichenbaum, 1977). Children who had difficulty learning mathematics received either cognitive modeling or didactic instruction on long division, followed by guided and self-directed practice opportunities, over sessions. The adult cognitive model verbalized division solution steps while applying them to problems. The didactic treatment consisted of children reviewing written step-by-step problem solutions. Both treatments enhanced self-efficacy, persistence, and achievement, but modeling led to higher achievement and more accurate correspondence between self-efficacy and actual performance. Results of a path analysis (Figure 2) showed that instructional treatment exerted direct effects on achievement and self-efficacy, that the effect of treatment on persistence operated indirectly through self-efficacy, that self-efficacy directly affected achievement and persistence, and that persistence had a direct effect on achievement.
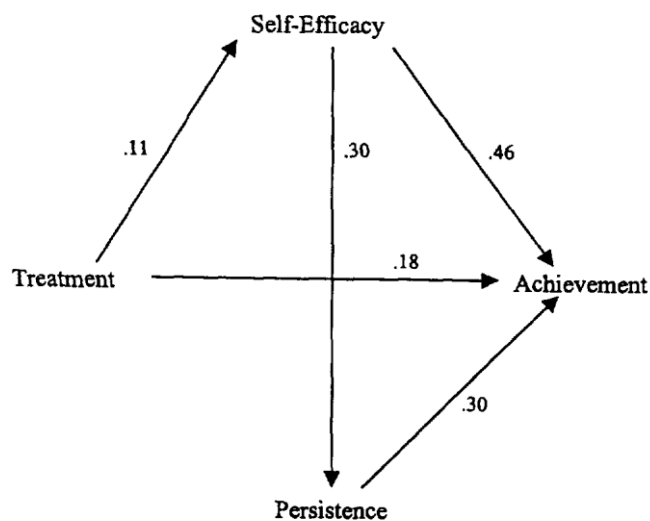

FIGURE 2   Path model of children's mathematical achievement with beta weights.

My colleagues and I have conducted research comparing mastery with coping models (Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987). Given the importance of perceived similarity, one way to enhance similarity is with coping models, who initially demonstrate problems learning but gradually improve and gain confidence. They illustrate how effort and positive thoughts can overcome difficulties. In addition to the modeled skills and strategies, observers learn and internalize these motivational beliefs and actions. Coping models contrast with mastery models, who demonstrate competent performance throughout the modeled sequence. In early stages of learning, many students may perceive themselves more similar in competence to coping models.

Schunk and Hanson (1985) compared peer mastery and coping models with adult models and no models. Mastery models solved subtraction problems correctly and verbalized statements reflecting high efficacy and ability, low task difficulty, and positive attitudes. Coping models initially made errors and verbalized negative statements, but then verbalized coping statements and eventually verbalized and performed as well as mastery models. After observing peer mastery or coping, adult mastery, or no models, children received instruction and self-directed practice over sessions. Peer mastery and coping models increased self-efficacy and achievement better than adult or no models; adult-model children outperformed no-model children.

The lack of differences between the coping and mastery model conditions may have arisen because children previously had experienced success with subtraction. Any type of peer model would have raised efficacy, and children may not have internalized coping strategies and progress beliefs. A follow-up study (Schunk, Hanson, & Cox, 1987) further explored mastery-coping differences and found that observing peer coping models enhanced children's self-efficacy and achievement more than did observing peer mastery models. Unlike the Schunk and Hanson (1985) study, this project used fractions--a task that children previously had not been successful at. Coping models may be more beneficial when students have little task familiarity or have had previous learning difficulties. Schunk et al. (1987) also found that multiple peer coping or mastery models promoted outcomes as well as a single coping model and better than a single mastery model. With multiple models, learners are apt to perceive themselves as similar to at least one model.

Another form of modeling is self-modeling, or cognitive and behavioral change brought about by observing one's own performances (Dowrick, 1983). Participants are videotaped while performing a task and subsequently view their tapes. Tapes allow for review and are especially informative for tasks one cannot watch while performing (e.g., motor skills or social interactions). Tapes socially convey to observers that they are becoming more skillful and will continue to make progress by employing effective strategies. The perception of progress raises self-efficacy and motivation, and can lead to greater self-regulated achievement.

In support of these points, Schunk and Hanson (1989) videotaped children solving mathematical problems and showed them their tapes, after which children engaged in self-directed practice. Subsequent self-modeling benefits were obtained as these children displayed higher self-efficacy, motivation, and self-regulated strategy use than children who had been taped but did not observe their tapes and children who had not been taped.

Self-Verbalization
A second type of social influence that can be internalized is modeled verbalization of actions, rules, strategies, and problem-solving operations. Research shows that verbalization of rules and strategies, when coupled with modeled actions, leads to better learning and achievement than does modeling alone (Rosenthal & Zimmerman, 1978).

Verbalization can be employed by models during the observation and emulation learning phases. As learners internalize verbalizations, they can generate them to guide their actions during the self-controlled and self-regulated phases. Verbalization has several benefits for learning and motivation. It helps students focus and maintain their attention on rules and strategies, which promotes their encoding and retention. Verbalization is a form of rehearsal, the effects of which on learning are well established. It also can create in students a sense of personal control when students believe they can use a strategy that will aid their learning. This belief can raise self-efficacy and maintain motivation for learning (Schunk, 1998).

Despite these benefits, verbalization constitutes an added task and may interfere with encoding for some learners (Schunk, 1998). If students concentrate too much on verbalizing, they may not attend properly to the content of the verbalizations and learning may suffer. Verbalization seems especially beneficial for learners who normally do not organize, rehearse, or closely attend to strategies and operations needed for success (Denney & Turner, 1979). Their achievement may suffer further from self-doubts about their capabilities. Students with a good grasp of cognitive operations and who typically self-monitor their performances may benefit less from verbalization.

Schunk (1982) identified elementary school children who could not solve long division problems and demonstrated low mathematical achievement. Children received modeled instruction and self-directed practice solving problems. Adult cognitive models verbalized strategy descriptors (e.g., "multiply," "check") at appropriate places. During self-directed practice, some children overtly verbalized the strategy descriptors, others constructed their own verbalizations (e.g., "How many times does 7 go into 22?"), children in a third group overtly verbalized strategies and self-constructions, and children in a fourth group did not verbalize.

Self-constructed verbalizations yielded the highest motivation during self-directed practice and posttest achievement. Children who verbalized explicit strategies and self-constructions demonstrated the highest self-efficacy. Analysis of children's self-constructed verbalizations showed that typically they included the strategies and were oriented toward effective problem solving.

Schunk and Cox (1986) examined the role of verbalization during learning of subtraction problem solution strategies. Participants were children with learning disabilities. While solving problems, continuous-verbalization students verbalized aloud their problem-solving operations, discontinued-verbalization children verbalized aloud during the first half of the instructional program but stopped verbalizing aloud during the second half, and no-verbalization children did not verbalize aloud.

Continuous verbalization led to the highest self-efficacy and achievement. When instructed to discontinue verbalizing aloud, discontinued-verbalization students may not have continued to use the verbal mediators to regulate their academic performances. For verbal mediators to become internalized, students may need to be taught to fade overt verbalizations to a covert level. Such fading is an integral component of self-instructional training (Meichenbaum, 1977; Meichenbaum & Asarnow, 1979).

Goals With Progress Feedback
Research investigating goals and progress feedback provides further evidence on how social information can be incorporated into a self-regulatory system to promote motivation and achievement. Extensive research literature attests to the effectiveness of goals in raising achievement outcomes (Bandura, 1988; Locke & Latham, 1990). Research also shows that goals that are specific, close at hand, and moderately challenging, enhance achievement beliefs and behaviors better than do goals that are general, temporally distant, and overly easy or difficult (Schunk, 1990).

As learners pursue goals it is necessary that they believe they are making progress toward goal attainment. When tasks have clear criteria to assess performance, learners can gauge progress on their own. Under these conditions, self-evaluation of progress is effective in sustaining learners' self-efficacy and motivation and can enhance self-regulated learning (Schunk, 1996; Schunk & Ertmer, 1999). On many tasks it is difficult to determine goal progress, especially when standards of progress are not clear and progress is slow (e.g., reading comprehension, composing text). Social feedback indicating progress can substantiate self-efficacy and motivation. As learners become more skillful, they become better at self-evaluating progress.

Schunk and Swartz (1993a, 1993b) tested the idea that providing learners with goals and progress feedback positively affects achievement outcomes and self-regulation beyond the learning setting. Children received paragraph-writing instruction and self-directed practice opportunities over sessions. An adult modeled a five-step writing strategy (e.g., choose a topic to write about, pick the main idea). After observing the model,

children received guided practice on applying the strategy to compose different types of paragraphs (e.g., descriptive, narrative, and informative), after which they practiced the strategy application on their own. Children were assigned to one of four experimental conditions. Process-goal children received instructions at the start of each session that emphasized learning to use the strategy to write paragraphs. Product-goal students were informed that their goal was to write paragraphs; general-goal children were advised to do their best. Half of the children assigned to the process-goal condition periodically received verbal progress feedback from the model that linked strategy use with improved performance (e.g., "You're doing well because you applied the steps in order"). Schunk and Swartz (1993a, 1993b) felt that children would have difficulty self-evaluating progress in composing paragraphs but that the progress feedback would raise self-efficacy and motivation. In contrast, assessing progress toward a product goal of writing paragraphs seemed straightforward, so feedback was not provided to these children.

The process-goal plus feedback condition was the most effective and some benefits were obtained from the process goal alone. Process-goal plus feedback students outperformed product-goal and general-goal students on self-efficacy, writing achievement, and strategy use while writing paragraphs. Gains were maintained after 6 weeks; children effectively self-regulated their composing strategies with types of paragraphs on which they had received no instruction.

Related evidence comes from research by Zimmerman and Kitsantas (1996), who compared the effects of process goals during self-directed learning to those of product goals without external feedback. High school girls received dart-throwing instruction. They were taught a strategy and engaged in self-directed practice. Some girls set a process goal of concentrating on strategy execution as they practiced, whereas others set a product (outcome) goal of trying to get many points. Compared with girls given a product goal, girls given a process goal demonstrated greater achievement, self-efficacy, self-evaluative reactions (satisfaction), and intrinsic interest in dart throwing.

These results suggest that in the initial stages of skill acquisition as strategies are being internalized, process goals enhance achievement better than product goals. Zimmerman and Kitsantas (1997) tested the hypothesis that product goals may better enhance performance once an internalized self-controlled level of skill is attained. They found that after students had internalized the dart-throwing strategy and could perform it flawlessly, product goals were more effective in raising achievement, self-efficacy, self-evaluative reactions, and intrinsic interest.

RELATED VIEWS

Collectively, this research supports the hypothesis that social factors influence learners' achievement beliefs and outcomes and when social information is internalized learners employ it self-regulatively to promote achievement. Although social cognitive theory is my conceptual focus, there are other theories that highlight the importance of the social environment on learning, motivation, and self-regulation. Three related perspectives are Harter's effectance motivation theory, Deci's self-determination theory, and Vygotsky's sociocultural theory. Hatter's (1978,1981) theory of effectance or mastery motivation postulates that socializing agents reinforce children for mastery attempts and that children gradually internalize a self-reward system and mastery goals. This system allows children to reinforce themselves for mastery attempts. Children acquire mastery goals through social modeling, and internalization becomes more complete with development.

In their self-determination theory of intrinsic motivation, Deci and his colleagues (Deci & Ryan, 1991; Ryan, Connell, & Deci, 1985) emphasized that an important aspect of development is the internalization of social values and mores. Internalization proceeds along a continuum. At the lowest external regulation level, people perform a task based on expected extrinsic contingencies (e.g., to obtain rewards or avoid punishments). The next level--introjected regulation--involves contingently applied self-approval or disapproval. At the third level (identified regulation), people engage in an activity because it is personally important. Finally, at the integrated regulation level people perform a behavior because of its importance to their sense of self.

Vygotsky's (1962) sociocultural theory postulates that socially-mediated activity is an important influence on thought. The social environment, coupled with personal factors, produces learning. The social environment influences cognition through its "tools"; namely, cultural objects and language, and social institutions. Cognitive change results from using cultural tools in social interactions and from internalizing and mentally transforming those interactions. Language---especially private (covert) speech--is a critical component and is used to self-regulate one's thoughts and actions. Language helps to develop thought by organizing behavior. Although these views stress social influences on learning and internalization as a key to effective self-regulation, they characterize self-regulation as a stage of development or as a general mechanism that operates across domains. Social cognitive theory differs in its emphasis on situational self-regulation. Self-regulation is highly context dependent; people are not generally self-regulated or non-self-regulated. Some generalization of self-regulatory strategies (e.g., goal setting) likely occurs across domains, but learners are not expected to display self-regulated actions equally in all domains.

Compared with these other views, this social cognitive formulation also differs in how internalization occurs. Although this conceptualization of internalization shares with Vygotsky's (1962) theory the emphasis on cognitive and metacognitive mediation (Karpov & Haywood, 1998), one difference is that Vygotsky placed greater emphasis on the role of private speech (Tudge & Winterhoff, 1993). This certainly is one means of internalization, but with developmental evidence showing a low incidence of private speech among children (Zimmerman, 1993), it cannot be the only one. Internalization also can be based on visual images, verbal meanings, and nonverbalized rules and strategies.

Furthermore, relative to the other views, this social cognitive model places greater emphasis on internalization occurring through reciprocal interactions among personal, environmental, and behavioral variables. Although social influence is important, it is not the only influence. And, social influence is not confined to the early stages of learning. It can occur at all phases of learning; even self-regulated learners require social assistance. In short, the social cognitive perspective highlights various influences that operate within specific domains and which learners can incorporate into their self-regulatory systems.

FUTURE DIRECTIONS

There are many promising areas of future research. Research should explore other means of social influence on achievement beliefs and behaviors and how effectively these means are internalized by learners and used for self-regulated skill refinement. For example, there are many forms of feedback: instructional, corrective, attributional, performance, progress, and social comparative. How these types of feedback are internalized and employed self-regulatively by learners should be studied in greater depth.

Researchers should also study less direct forms of social information. The research I have described provided rather direct information through modeled demonstrations and verbalizations, assistance with goal setting, and provision of explicit feedback on progress. Not all social information is this direct. Two research examples of alternative environmental influence are Butler's (1998) strategic content learning model, which stresses coconstructed self-regulated learning strategies, and Winne and Stockley's (1998) bootstrapping model of self-regulated learning in a technological environment.

Future research should explore, in depth, the process whereby social influences become internalized by students and how this process is facilitated. For example, information-processing research has shown that practice--a form of rehearsal--serves to instate information in memory and link it to related information. Research should explore whether multiple links facilitate subsequent self-regulated use of skills and strategies.

Research is needed to explore how systematic variations in socially-transmitted motivational factors impact their internalization and self-regulation. Motivation plays a critical role in converting socially-derived information into self-regulatory influences. Key motivational processes are perceived value, self-efficacy, outcome expectations, attributions, goals, and self-evaluations of progress (Schunk, 1990; Wigfield, 1994). Social factors that impact these should help to develop skills and assist learners in internalizing factors that can

be used self-regulatively. I have shown how coping models, verbalization of achievement strategies and beliefs, and goals with progress feedback exert beneficial effects on motivation, but clearly more work is needed.

Finally, I recommend exploring how instruction can be adapted to facilitate internalization of social information and its self-regulated application by learners. One avenue is through self-directed mastery. This procedure is an integral component of Bandura' s (1977,1986) participant modeling procedure, in which models initially explain and demonstrate actions, after which learners perform the actions with the models' assistance. Gradually the aids are withdrawn until finally learners practice skills independently. This procedure provides for internalized self-regulatory control and builds self-efficacy and motivation as students understand that they are able to perform competently on their own (Schunk, 1998).

Self-monitoring offers another means of facilitating internalization. Self-monitoring refers to deliberate attention to aspects of one's behaviors, and is aided by recording at the time of their occurrence, rate, and so forth (Mace, Belfiore, & Shea, 1989; Zimmerman, Bonner, & Kovach, 1996). Self-monitoring has been used effectively in study skills learning (Lan, 1998; Schunk, 1983; Zimmerman et al., 1996).

A third means is providing learners with periods of self-reflection during or after learning. Research shows that self-evaluation of learning capabilities or progress during periods of self-reflection is effective in raising self-efficacy, motivation, and learning (Schunk, 1996; Schunk & Ertmer, 1999). Self-reflective periods also can be structured such that learners can think about the strategies they are learning and to decide how to use them most effectively.

CONCLUSION

I have discussed the importance of providing learners with information via social means that they internalize and use self-regulatively to enhance achievement outcomes. I am encouraged by the attention given by researchers and practitioners to the topics of skill acquisition and self-regulation, and I know that our understanding of these processes will continue to grow. The better we understand the multiple mechanisms involved in learning, the better we can prepare students to learn in and beyond the classroom.

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