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ABSTRACT

This paper reviews the social origins of students' development of self-regulatory skill, with special emphasis on observational learning through peer modeling. A social cognitive perspective on self-regulation is presented. In this view students' academic competence develops initially from social sources of academic skills and subsequently shifts to self-sources in a series of four levels: observational, imitative, self-controlled, and self-regulated. The effects of models on observers depend in part on perceptions of self-efficacy, or personal beliefs about one's capabilities to learn or perform behaviors at designated levels. Research is reviewed on cognitive modeling, coping and mastery models, and self-modeling. Implications for educational practice are discussed. Contains 31 references. (Contains 31 references.)

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**Social Origins of Self-Regulatory Competence:
The Role of Observational Learning Through Peer Modeling**

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Abstract

This paper reviews the social origins of students' development of self-regulatory skill with special emphasis on observational learning through peer modeling. A social cognitive perspective on self-regulation is presented. In this view, students' academic competence develops initially from social sources of academic skill and subsequently shifts to self sources in a series of four levels: observational, imitative, self-controlled, self-regulated. The effects of models on observers depend in part on perceptions of self-efficacy, or personal beliefs about one's capabilities to learn or perform behaviors at designated levels. Research is reviewed on cognitive modeling, coping and mastery models, and self-modeling. Implications for educational practice are discussed.

Social Origins of Self-Regulatory Competence:

The Role of Observational Learning Through Peer Modeling

An essential feature of children's adjustment to school is their development of academically-related self-regulation and motivation. Until recently there has been relatively little detailed information about how socialization influences affect children's self-regulatory development. Since the late 1950s, researchers in the social learning tradition (Bandura & Walters, 1963) have hypothesized that children's exposure to socializing agents, especially models, influences their behavioral and cognitive development (e.g., formation of concepts, attitudes, preferences, standards for self-reward and self-punishment). They found extensive evidence that children readily induce and transfer concepts that underlie modeling sequences (Rosenthal & Zimmerman, 1978; Zimmerman & Rosenthal, 1974).

In recent years, social cognitive theorists shifted their attention to adolescents' internalization of self-regulatory competence and studied how youngsters learn to function independently from socializing agents in an adaptive, generative, and creative manner. Bandura (1986) emphasized the importance of a number of specific self-regulatory processes. Self-regulation refers to processes students use to activate and sustain cognitions, behaviors, and affects, which are oriented toward the attainment of goals (Zimmerman, 1989, 1990). Academic self-regulatory

processes include planning and managing time; attending to and concentrating on instruction; organizing, rehearsing, and coding information strategically; establishing a productive work environment; and using social resources effectively. In addition, self-regulation incorporates such motivational processes as setting performance goals and outcomes; holding positive beliefs about one's capabilities; valuing learning and its anticipated outcomes; and experiencing pride and satisfaction with one's efforts (Schunk & Zimmerman, 1994).

This paper focuses on the social origins of students' development of self-regulatory skill with special emphasis on observational learning through peer modeling. Modeling occurs when observers pattern their behaviors, strategies, thoughts, beliefs, and affects, after those of one of more models (Schunk, 1987). The effects of models on observers depend in part on perceptions of self-efficacy, or personal beliefs about one's capabilities to learn or perform behaviors at designated levels (Bandura, 1986, in press). Recent research has demonstrated the effectiveness of modeling self-regulatory skills on students' academic achievement and associated self-efficacy beliefs (Schunk & Zimmerman, 1994).

Theoretical Background

Development of Self-Regulatory Competence

According to a social cognitive perspective, students' academic competence develops initially from social sources

of academic skill and subsequently shifts to self sources in a series of levels of skill as depicted in Table 1 (Zimmerman & Bonner, in press). At the outset, novice learners acquire learning strategies most rapidly from social modeling, tuition, task structuring, and encouragement (Zimmerman & Rosenthal, 1974). Although many learners can induce the major features of learning strategies from watching a model (observational level of academic skill), most of them will require motoric performance experiences in order for them to fully incorporate the skill into their behavioral repertoire. If the model adopts a teaching role and provides guidance, feedback, and social reinforcement during imitative practice, the observer's motoric accuracy can be improved further. During participant or mastery modeling (Bandura, 1986), the model repeats selected aspects of the strategy and guides enactment based on the learners' imitative accuracy. An imitative level of academic skill is attained when the learner's performance approximates the general form of the model. This does not mean that the observer is exactly copying the model (an effect termed "response mimicry"). More often, the learner emulates only the general pattern or style of the model, such as the type of question a model asks instead of duplicating the model's words (Zimmerman & Rosenthal, 1974).

Insert Table 1 about here

Although the source of learning of a skill is primarily social for the first two levels of academic competence, it shifts to self-influences at more advanced levels. The most apparent manifestation of a third or self-controlled level of academic skill is a learner's ability to use the strategy independently when performing on transfer tasks. Students' use of a learning strategy becomes internalized during this phase, but it remains dependent on representational standards of a model's performance (i.e., covert images and verbal meanings) and the self-reinforcement that stems from matching them (Bandura & Jeffery, 1973).

Socialization agents expect an even higher level of self functioning when students' reach adolescence. A fourth or self-regulated level of academic skill is needed so learners can systematically adapt their learning strategies to changing personal and contextual conditions (Bandura, 1986). At this level of academic competence, the learner can initiate use of strategies, can incorporate adjustments based on contextual features of the applied situation, and is motivated primarily by self-efficacy perceptions of enactive success. The learner chooses when to use a strategy and varies its features self-regulatively, with little or no residual dependence on the model.

In summary, a four level analysis of self-regulatory development extends from acquiring knowledge of learning skills (observation), to using them (imitation), to their

internalization (self-control), and finally to their adaptive use (self-regulation). Although this social cognitive model was initially derived from research on children's socialization processes, it has proven useful in guiding instructional efforts to teach students how to acquire and eventually self-regulate their academic learning.

Social Cognitive Theory of Self-Regulation

Bandura's (1986) social cognitive theory views human functioning in terms of interactions between behaviors, environmental variables, and cognitions and other personal factors. Each of these three classes of variables can influence the other and is in turn influenced by it.

Social cognitive research has identified three major classes of self-regulation: self-observation, self-judgment, and self-reaction (Bandura, 1986; Kanfer & Gaelick, 1986). Self-observation involves deliberate attention to specific aspects of one's behavior (Bandura, 1986). Behaviors can be assessed on such dimensions as quantity, quality, rate, and originality. When self-observation reveals goal progress, it can motivate one to improve (Schunk, in press). Often students with academic problems are surprised to learn that they waste much valuable study time on nonacademic distractions. Such knowledge can motivate students to reform their ways. Self-observation is assisted with self-recording, where instances of behavior are recorded

along with their time, place, and frequency of occurrence (Mace, Belfiore, & Shea, 1989).

Self-observation is closely linked to a second self-regulatory process, self-judgment, which refers to comparing present performance with a standard. Self-judgments are affected by type and importance of standards employed.

Standards may be stated in absolute or normative terms. The standard for an absolute goal is fixed (e.g., write five pages in one hour). Normative standards are based on performances of others and often are acquired by observing models (Bandura, 1986). Social comparison of one's performances with those of others helps one evaluate the appropriateness of behavior. Social comparison becomes more likely when absolute standards are not in effect or are unclear (Schunk, in press).

Self-judgments are also affected by the importance of standards. People make progress judgments for behaviors they value. They may not assess their performance or expend effort to improve their skills in areas where they care little how they perform.

Standards are informative and motivational. Comparing one's performance against standards informs one of progress. Writers who must complete a 30 page chapter in a week know they are ahead of schedule if they complete three pages during the first hour. The awareness that one is making extraordinary progress enhances self-efficacy and sustains motivation (Schunk, in press).

Self-reaction refers to evaluations made of one's performance: good/bad, acceptable/not acceptable, beyond/below expectation. Evaluative reactions involve students' beliefs about their progress. The belief that one is making acceptable goal progress, along with the anticipated satisfaction of goal attainment, enhances self-efficacy and sustains motivation. Negative evaluations will not decrease motivation if students believe they are capable of improving (i.e., by working harder or using more effective strategies) (Schunk, in press). Motivation is not enhanced if students think they lack the ability to succeed and that more effort or better strategy use will not help. Self-reactions can be augmented by tangible rewards, which validate the perception of progress and raise self-efficacy when they are linked to actual accomplishments.

These self-regulatory processes interact with one another. As students observe aspects of their behavior, they judge them against goal standards and react to those judgments. Their evaluations and reactions set the stage for additional observations of the same behaviors or of others. These processes also interact with environmental factors (Zimmerman, 1989). Students who judge their task progress as inadequate may react by requesting teacher assistance. Teachers may teach students a better strategy, which students then use to promote learning. This dynamic interaction of self-regulation processes is one of its central features (Schunk & Zimmerman, 1994).

Modeling Processes

Modeling processes are important components of self-regulation. Modeling can serve different functions: inhibition/disinhibition, response facilitation, observational learning. Inhibition/disinhibition means that observing a model can strengthen or weaken behavioral inhibitions. Response facilitation denotes modeled actions serving as social prompts for observer behavior.

Observational learning through modeling occurs when observers display new behaviors that prior to modeling had no probability of occurrence, even when motivational inducements are offered (Bandura, 1986; Schunk, 1987). To learn observationally, students must attend to a model, code the information for retention, be capable of producing the demonstrated response pattern, and be motivated to perform imitatively (Bandura, 1986). An important form of observational learning occurs through cognitive modeling, which incorporates modeled explanations and demonstrations with verbalizations of the model's thoughts and reasons for performing the actions (Meichenbaum, 1977).

The functional value of behavior--whether modeled behaviors result in success or failure, reward or punishment--exerts strong effects on observer modeling. Modeled behaviors are likely to be performed if they previously led to rewarding outcomes but are unlikely if they resulted in punishment.

Modeling experiences fulfill informational and motivational functions. Vicarious consequences indicate the motivational value of behavior to observers (Bandura, 1986); antecedent actions inform observers about what should be done to attain them. Most social situations are structured so that the appropriateness of behaviors depends on such factors as age, gender, or status. By observing modeled behaviors and their consequences, people formulate expectations about the likely outcomes of actions. Vicarious consequences create outcome expectations about which behaviors will be rewarded and which punished.

Perceived similarity between model and observer is hypothesized to be an important source of information to determine behavioral appropriateness and formulate outcome expectations (Schunk, 1987). The more alike observers are to models, the greater is the probability that similar actions by observers are socially appropriate and will produce comparable results. Model attributes often are predictive of the functional value of behavior. Similarity should be especially influential in situations where observers have little information about functional value. Modeled behaviors on tasks that observers are unfamiliar with or those that are not immediately followed by consequences may be highly susceptible to influence by attribute similarity.

Vicarious consequences also motivate observers. These effects depend in part on self-efficacy. Similarity to

models constitutes an important source of vicarious information for gauging one's efficacy. Observing similar others succeed can raise observers' efficacy and motivate them to try the task based on the assumption that if others can succeed they can as well. Observing similar others experiencing difficulty may lead observers to doubt their own capabilities and undermine their motivation to try the task. Model attributes provide information about what one can do. Similarity is highly influential in situations where individuals have experienced difficulties and hold doubts about performing well.

Self-Efficacy

Self-efficacy is hypothesized to influence choice of tasks, effort expenditure, persistence, and achievement (Bandura, 1986, in press; Schunk, in press; Zimmerman, in press). Compared with students who doubt their learning capabilities, those holding a sense of efficacy for acquiring a skill or performing a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level.

Learners obtain information to appraise their self-efficacy from their performance accomplishments, vicarious (observational) experiences, forms of persuasion, and physiological reactions. Students' own performances offer reliable guides for assessing self-efficacy. Successes raise efficacy and failures lower it. Students socially acquire efficacy information by comparing their

performances with those of others. Similar others offer the best basis for comparison (Schunk, 1987). Students who observe similar peers perform a task are apt to believe that they, too, are capable of accomplishing it. Learners often receive from teachers, parents, coaches, and peers, persuasive information that they are capable of performing a task ("You can do this"). Students also acquire efficacy information from physiological reactions (e.g., sweating, heart rate).

Information derived from these sources does not influence self-efficacy automatically but rather is cognitively appraised (Bandura, 1986, in press). Learners weigh and combine the contributions of many factors including perceptions of ability, task difficulty, amount of effort expended, amount and type of assistance from others, perceived similarity to models, and persuader credibility (Schunk, 1987).

Self-efficacy is important but not the only influence on achievement behavior. High self-efficacy will not produce competent performances when requisite knowledge and skills are lacking. Outcome expectations are influential because students engage in activities they believe will lead to positive outcomes. Similarly, perceived value (importance attached to learning or what use will be made of what one learns) affects behavior because learners show little interest in activities they do not value.

Effective self-regulation depends on a sense of self-efficacy for using skills to achieve mastery (Bandura, 1986, in press; Bouffard-Bouchard, Parent, & Larivee, 1991; Schunk, in press; Zimmerman, 1989). As students work on a task they compare their performances to their goals. Self-evaluations of progress enhance self-efficacy and keep students motivated to improve. Students who feel efficacious about learning or performing well are apt to implement various effective self-regulatory strategies, such as concentrating on the task, using proper procedures, managing time effectively, seeking assistance as necessary, and monitoring performance and adjusting strategies as needed (Zimmerman, 1994).

Although low self-efficacy is detrimental, effective self-regulation does not require that self-efficacy be extremely high. Salomon (1984) found that lower self-efficacy led to greater mental effort and better learning than when efficacy was higher. Assuming that learners feel efficacious about surmounting problems (a very low sense of efficacy is not motivating), holding some doubt about whether one will succeed may mobilize effort and effective use of strategies more than will feeling overly confident.

Research Evidence

In this section we present a limited review of research on the social origins of self-regulatory competence. We focus on observational learning through peer modeling. We

should note that there are other influences that depend less on the social environment; for example, self-instruction, personal goal setting, self-monitoring, self-evaluation, help seeking, and time management. These other sources are discussed elsewhere (Schunk & Zimmerman, in press).

Models are important sources for the initial development of self-regulation: an observational level of skill. By observing models, students acquire knowledge and strategies that they subsequently apply as they work on tasks. Modeled displays also convey to observers that they can succeed if they follow the same sequence of actions. The belief that one knows what to do to perform a task raises self-efficacy, which is increased further as observers work on the task and experience success (Schunk, 1987).

An important means of developing an observational level of competence is through cognitive modeling. Schunk (1981) gave children who had encountered difficulty in mathematics either cognitive modeling or didactic instruction. In the modeling treatment children observed an adult model verbalize division operations while applying them to problems. The didactic treatment consisted of children reviewing instructional pages that portrayed the solution of division problems step-by-step. Both cognitive modeling and didactic instruction led to significant increases in self-efficacy, skill, and persistence, but modeling resulted in significantly higher division skill performance. Results

of a path analysis showed that self-efficacy had an direct effect on both persistence and skill.

Perceived similarity to models in important attributes can raise observers' self-efficacy and motivate them to try the task because they are apt to believe that if others can succeed they can as well (Schunk, 1987). One way to vary similarity is through the use of coping and mastery models. Coping models initially demonstrate the typical behavioral deficiencies and possibly fears of observers but gradually improve their performance and gain self-confidence. These models illustrate how effort and positive thoughts can overcome difficulties. Mastery models demonstrate faultless performance from the outset (Schunk, 1987).

Schunk and Hanson (1985) compared peer mastery and coping models with adult teacher models and no models. Peer mastery models solved subtraction problems correctly and verbalized statements reflecting high self-efficacy and ability, low task difficulty, and positive attitudes. Peer coping models initially made errors and verbalized negative statements, but then verbalized coping statements (e.g., "I need to pay attention to what I'm doing") and eventually verbalized and performed as well as mastery models. Peer models increased self-efficacy and skill better than the teacher model or no model; teacher-model children outperformed no-model students. Although teacher models can teach students self-regulatory skills, students' self-efficacy beliefs for learning may be aided better by

observation of similar peers. In turn, self-efficacy can raise motivation for skill improvement.

Schunk, Hanson, and Cox (1987) found that observing peer coping models enhances children's self-efficacy and skillful performance more than does observing peer mastery models. Unlike the Schunk and Hanson (1985) study, these authors used a task (fractions) with which children had no prior successful performances. Coping models may be more beneficial when students have little task familiarity or have encountered previous learning difficulties. Schunk et al. (1987) also showed that multiple models (coping or mastery) promote outcomes as well as a single coping model and better than a single mastery model.

Models can convey abstract rules and concepts for self-regulation, such as self-evaluative standards. Bandura and Kupers (1964) exposed children to a model demonstrating stringent or lenient standards while playing a bowling game. Children exposed to high-standard models were more likely to reward themselves for high scores and less likely to reward themselves for lower scores compared with subjects assigned to the low-standard condition. Davidson and Smith (1982) had children observe a superior adult, equal peer, or inferior younger child set stringent or lenient standards while performing a pursuit rotor task. Children who observed a lenient model rewarded themselves for lower scores than those who observed a stringent model. Children's self-reward standards were lower than those of

the adult, equal to those of the peer, and higher than those of the younger children. Age similarity may have led children to believe that peer standards were appropriate for them.

Models can provide social evaluative cues, feedback, and assistance to help observers achieve an imitation level of motoric competence as well. France-Kaatrude and Smith (1985) had first and fourth graders perform a pursuit-rotor task and children could compare their performances with a peer of higher, equal, or lower competence. Compared with children offered social comparisons with superior or inferior peers, those allowed to compare with a similarly-performing peer compared more often, demonstrated greater task persistence, and took fewer self-rewards.

Self-modeling, which involves watching one's own performances, is another effective method of developing imitative competence (Dowrick, 1983). Typically one is videotaped while performing a task and subsequently views the tape. Tapes allow for review and are especially informative for tasks one cannot watch while performing. When performances contain errors, commentary from a knowledgeable individual during tape review helps to prevent performers from becoming discouraged. The expert can explain how to execute the behavior better the next time. Tapes can convey to observers that they are becoming more skillful and can continue to make progress, which raises self-efficacy. In support of these points, Schunk and

Hanson (1989) videotaped children solving problems and showed them their tapes. Subsequent self-modeling benefits were obtained as these children displayed higher self-efficacy and motivation than children who had been taped but did not observe their tapes and those who had not been taped.

To fully achieve an imitative level of competence, adults must fade social and instructional supports and encourage students work on tasks on their own. This should be done gradually as students abstract the underlying learning strategy and receive progress feedback.

Implications for Practice

The ideas we have presented suggest many potential implications for educational practice. Teachers should make greater use of models in the classroom by emphasizing the importance of cognitive modeling where models verbalize their thought processes, in addition to the steps they perform, as they work on a task (Zimmerman & Kleefeld, 1977). Coping models can help relieve students' fears and build their confidence by verbalizing coping statements (e.g., "I have to pay better attention") and progress statements ("I'm doing better").

Models are teachers or peers who explain and demonstrate skills and strategies in front of classes, but there are other ways to use models in the classroom. One way is in cooperative groups, in which a small number of students work jointly on a task. Responsibilities are

divided so each group member is responsible for something. Groups typically are set up so that each member must master the skills and the group is not allowed to proceed until such skill mastery occurs. The characteristics of effective groups have been documented (Cohen, 1994). For our purposes it is essential that students serve as models for one another. A good way to do this is for each student to work on some aspect of the task, and then explain it to the other group members after he or she has mastered it. This type of positive peer model teaches skills and raises others' self-efficacy.

Teachers can develop student's self-regulatory skills with models; however, self-regulative mastery requires more than observational learning experience, it involves practicing those components. If teachers can incorporate many of the above procedures into regular classroom instructional exercises, students will have opportunities to develop their self-regulatory skills.

Students need to practice skills at home and in other contexts as well as school environments. Parents and other siblings are important in the development of children's self-regulatory competencies. One way they can have a major impact is by systematic modeling skills they want children to display. When models act one way and verbalize another type of behavior children are more strongly influenced by the modeled behaviors than by the preaching (Bryan & Walbek, 1970). If parents want children to set goals, then parents

should set goals themselves and assist children with goal setting. Parents also can enlist the aid of older siblings to serve as good models from whom children can acquire self-regulatory skills.

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Table 1
 A Social Cognitive Analysis of Primary Influences on
 Students' Self-Regulatory Development

Levels of Development	Social Influences	Self-Influences
Observational	Modeling, Verbal Description	
Imitative	Social Guidance and Feedback	
Self-Controlled		Internal Standards, Self-Reinforcement
Self-Regulated		Self-Regulatory Processes, Self- Efficacy Beliefs