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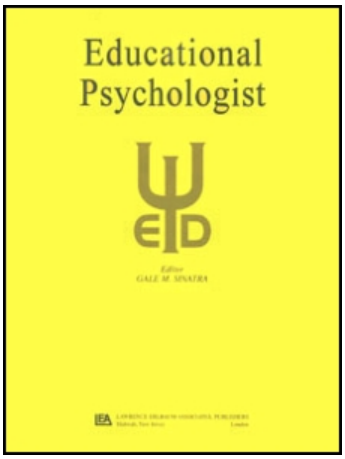

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Self-Regulation Involves More Than Metacognition: A Social Cognitive Perspective

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The issues that Winne found troubling about student failures to self-regulate effectively were considered from a social cognitive perspective. From this viewpoint, self-regulation involves more than metacognitive knowledge and skill, it involves an underlying sense of self-efficacy and personal agency and the motivational and behavioral processes to put these self beliefs into effect. Views of self-regulated learning that do not include this core self-referential system have difficulty explaining human failures to self-regulate, especially when such efforts are known metacognitively to be helpful. To explain students' self-regulation failures as well as their successes in naturalistic settings, educational psychologists need to expand their views of self-regulation beyond metacognitive trait, ability, or stage formulations and begin treating it as a complex interactive process involving social, motivational, and behavioral components. Such a perspective reveals not only the complexity of self-regulation but also the human side of it—the role of our self-doubts, false beliefs, unfortunate self-monitoring, and strategy choice dilemmas.

Winne's provocative essay (1995) raised interesting questions about what effective self-regulated learning (SRL) is and how it can be developed so that it is sustained and transferred. He concluded that SRL blends deliberative and nondeliberative forms of cognitive engagement, that knowledge is a powerful and pervasive determinant of SRL method, and that there are inherent obstacles hampering students' learning to self-regulate. These obstacles include a learner's (a) failing to apply sufficient effort to academic self-regulation, (b) engaging in self-monitoring when it conflicts with acquisition, (c) expecting quick learning epistemically, (d) making inaccurate predictions of learning based on massed practice, and (e) failing to coordinate study tactics as one practices behaviorally. It should be noted that obstacle a deals with insufficient motivation to self-regulate, obstacles c and d involve inaccurate expectations and self-beliefs about learning, and obstacles b and e concern ineffective metacognitive self-monitoring and adjustment of learning methods.

Winne's concern that these aspects of SRL may have been overlooked or are theoretically problematic may be traceable to a metacognitive view of self-regulation. He characterized SRL "as a cognitively inherent aspect of learning" (p. 186) "This fusion of information that is processed and information processing events, performed serially over time, *is* [italics added] self-regulated cognitive engagement" (p. 173). Winne also viewed motivation as a form of knowledge for reaching learning goals that are inherently valued. He portrayed students idealistically as highly rational in their goal setting, cognitive monitoring, and use of learning strategies. Unfortunately, it is one thing to possess metacognitive knowledge and skill but another thing to be able to self-regulate its use in the face of fatigue, stressors, or competing attractions. The aspect of SRL that plays a central role—namely, the capability to mobilize, direct, and sustain one's instructional efforts—has received relatively little attention in metacognitive accounts of academic self-directedness. Although empirical solutions to the specific issues that Winne raised may not be at hand yet, the psychological processes underlying these classes of functioning are being actively studied from other theoretical perspectives on self-regulation, and some interesting findings have been reported (Schunk & Zimmerman, 1994). Many of these alternative models embed rational metacognitive processes within a larger self-system that also includes subjective, behavioral, and social–environmental factors (McCombs, 1989; Schunk, 1991; Zimmerman, 1989).

In contrast to metacognitive models, which emphasize knowledge states and deductive reasoning, personal agency formulations assume that self-beliefs and judgments often are formed intuitively and applied behaviorally in specific contexts. Contextually related self-processes, such as perceived competence and self-efficacy, have been shown to be well suited to explaining motivational issues such as effort, persistence, and task choice (Bandura, in press-b; Pajares & Miller,

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1994; Schunk, 1989; Zimmerman, 1995), even when these beliefs are metacognitively inaccurate (Collins, 1982). From a social cognitive perspective (Schunk, 1989; Zimmerman, 1989), SRL involves more than metacognitive knowledge and skill, it involves a sense of personal agency to regulate other sources of personal influence, such as emotional processes, as well as behavioral and social–environmental sources of influence. The advantage of a more encompassing perspective is that many of the issues Winne raised can be interpreted in light of a broader range of research, such as investigations of self-beliefs, behavioral as well as metacognitive forms of self-monitoring, and the role of social context on human reasoning and functioning.

An initial problem that Winne mentioned concerns the willingness of learners to exert the effort necessary to engage self-regulatory processes. He recommends the need to consider learned industriousness as a suitable construct to explain self-regulatory transfer. In support of this construct, he discussed Eisenberger, Masterman, and McDermitt's (1982) study indicating transfer from solving high difficulty and high variety problems to writing higher quality and longer essays. Unfortunately, the results of the study are difficult to interpret because no direct measures of learned industriousness were reported, such as perceived effort on the tasks. Is writing a longer essay a pure measure of effort or does it involve other factors?

Winne's subsequent interpretation of the Rabinowitz, Freeman, and Cohen (1993) study as also indicative of learned industriousness is not convincing either, despite the inclusion of a measure of perceived effort. In this investigation, no differences were found in self-reported effort when categorizing easy and difficult stimuli during an initial learning phase or during transfer with stimuli of intermediate difficulty. This was surprising because there was direct evidence learners perceived the difficulty of the tasks accurately. Although there was a significant difference in recall of easy versus difficult stimuli on the learning task, a similar difference was not present on the transfer task. These complex results reveal that experimental manipulations of task difficulty, even when accurately perceived by learners, do not necessarily affect effort expenditure, and effort expenditure did not predict recall. Thus, this study provides little indication that learned industriousness is a motive to self-regulate learning. Fortunately, there are other more interpretable bodies of research bearing on the issue of self-perceptions and motivation to self-regulate learning.

For example, there is evidence that perceptions of competence and self- efficacy are predictive of academic motivation and achievement in naturalistic contexts (Lent, Brown, & Hackett, 1994; Meece, Wigfield, & Eccles, 1990; Zimmerman, Bandura, & Martinez-Pons, 1992) as well as student use of a wide variety of SRL practices (Schunk, 1989; Zimmerman, 1995). With regard to writing, Zimmerman and Bandura (1994) showed that self-regulatory efficacy predicted self-efficacy to achieve, setting academic goals and self-evaluative standards as well as final grades during a collegiate course. Although these were not laboratory studies involving separate measures of acquisition and transfer, they did provide descriptive field evidence that a measure of perceived efficacy to write was predictive of not only writing achievement but also of sustained motivation for significant periods of time. It is possible that subjects in Eisenberger et al.'s (1982) learned industriousness study acquired a greater sense of self-efficacy, which would be an interesting question to pursue in future research. The transfer of motivation does not pose a special explanatory problem for theories that can handle self-perceptions as central constructs because changes in perceived competence between learning and transfer tasks can be compared and correlated with subsequent motivation on these tasks. The perceived correspondence between the tasks can be determined for each subject and used to predict the degree of transfer. Finally, there are conceptual advantages for using motivational constructs that have been studied widely in prior SRL research, such as self-efficacy, because their construct validity and linkage to performance outcomes is well established.

A second problem that Winne discussed concerns potential conflicts between metacognitive self-monitoring and cognitive acquisition processes. In Kanfer and Ackerman's (1989) study of monitoring during landing an airplane in a simulator, students who were given specific challenging goals (90th percentile or above) after five learning trials were assumed to have cognitively monitored the task differently from those who were told to "do their best" (p. 13). The results indicated that the subjects given specific challenging goals did perform better, and this was interpreted as indicating that monitoring should be delayed until encoding of declarative knowledge shifts to procedural knowledge. Several points need to be made concerning this interpretation. First, the actual experimental manipulation was goal setting rather than self-monitoring, and metacognitive self-monitoring was not directly measured but instead was inferred. Second, metacognitive self-monitoring is difficult to separate experimentally from the cognitive processes of concentration and attention. Third, metacognitive self- monitoring differs substantially from behavioral self-monitoring in form and timing. In behavioral studies of self-monitoring, a learner often can use natural records of performance accomplishments, such as pages read or questions answered after reading, without requiring active metacognitive monitoring during acquisition. In other cases, students can record their behavioral performances electronically (by audio- or videotape) and need not analyze them until afterward. Under these common behavioral self-monitoring circumstances, learners do not need to balance concentrating on learning with monitoring but rather can separate these two functions sequentially. Thus, the implications of the Kanfer and Ackerman study regarding metacognitive and cognitive conflict during SRL are not clear or inevitable.

In addition, there is reason to question Kanfer and Ackerman's conclusion that metacognitive monitoring during the declarative knowledge stage (first five learning trials) is necessarily detrimental. Schunk and Swartz (1991, 1993)

have shown that students' self-monitoring during the initial practice trials can be helpful if it is directed toward strategic processes instead of learning outcomes. Zimmerman and Bonner (in press) have suggested that self-monitoring changes as one develops self-regulatory competence. They hypothesized that optimal self-monitoring shifts from strategic processes during a preliminary phase in the development of self-regulatory competence (termed *self-control*) to performance outcomes during a final self-regulatory phase. This self-control phase of development seems close in its sequential emergence during learning (but not its form) to what Winne described as the acquisition of declarative knowledge. Thus, there is some agreement that premature focusing on behavioral outcomes can retard routinization of a strategy. However, there are now several studies indicating that self-monitoring of strategic processes can facilitate initial acquisition (Zimmerman & Kitsantas, in press). It is suggested that self-monitoring can be helpful during all phases of learning but that its focus needs to shift depending on the students' phase of self-regulatory development on the task.

A third problem that Winne raised concerns the role of a learner's epistemic orientation toward academic self-regulation. He discussed Schommer's (1990) study of various epistemic orientations among college students enrolled in psychology and physics classes. The results indicated that students with a quick, epistemic orientation significantly overestimated their future scores on a test and in fact did more poorly than other students. Furthermore, a path analysis revealed that students' quick learning orientation correlated negatively with test preparation and performance. These results were interesting because they showed that students' epistemic expectations or beliefs about learning capability directly affected academic motivation and achievement.

Schommer's epistemological taxonomy of beliefs about the control of knowledge acquisition was drawn from Dweck and Leggett's (1988) distinction between fixed entity and incremental beliefs about intelligence and from Schoenfeld's (1983) identification of a subset of students who believed in quick all-or-nothing problem solving. Quick learning and fixed-entity notions both convey an expectation for rapid learning outcomes (either acquisition or failure), whereas an incremental notion implies gradually apparent outcomes. Schommer's findings revealed poorer motivation and achievement by students with a quick learning orientation, however, they did not focus on specific self-regulatory processes stemming from this epistemic orientation. There is experimental research showing induced ability beliefs can affect these processes.

Wood and Bandura (1989) compared the effects of fixed entity and incremental ability beliefs with students in a business school. These graduate students were given either an incremental-learning expectation or a fixed-entity expectation when learning management skills on a complex simulation task. Students with a fixed entity expectation responded to their performance feedback with a diminishing sense of self-efficacy and lower ultimate achievement, whereas students with an incremental expectation reported increased self-efficacy and higher achievement. This study revealed that general expectations about learning can significantly affect personal interpretations of feedback and progress. More importantly, the role of students' ability beliefs were related directly to learning via a widely studied process measure—perceptions of self-efficacy.

A fourth issue Winne raised concerned the role of inaccurate predictions of learning based on massed practice. He discussed a study of feelings of knowing (FOK) from a program of research by Nelson and colleagues. Nelson and Dunlosky (1991) found that learners who developed their FOK from massed learning and immediate testing experiences were more inaccurate than learners who based their FOK on distributed learning and delayed testing. Both over- and underestimation of learning were reported. These findings of inaccurate FOK are interesting not only because of their negative metacognitive implications but also because of their motivational implications. Salomon (1984) found that children accurately estimated their self-efficacy when learning from print media but overestimated their efficacy when learning from television. Of course, recreational uses of television seldom involve demanding tests of content mastery, and thus the children's prior experience with the medium would be misleading. The youngsters' overestimations of the efficacy of televised instruction led them to exert less mental effort and to achieve less than children who learned from printed sources. Clearly, self-efficacy beliefs depend on the validity of prior learning and testing experiences. However, overestimation of the probability of learning success can also motivate learners to persist in the face of obstacles. Bandura (in press-b) discussed numerous instances when excessive self-efficacy has been shown to have considerable functional value. Many famous writers had to endure years of rejection before their works were accepted by publishers (White, 1982). Without a strong sense self-efficacy, they would have become discouraged after a few rejection letters and given up, thereby depriving society of their enlightening works. The same dogged persistence is essential for many other professionals, including athletes, artists, scientists, and entrepreneurs. Objective probabilities regarding one's chances of success often cannot be determined in naturalistic settings, and overestimation of competence in these circumstances may be essential to long-term success. Thus, optimistic self-beliefs can motivate efforts that, over the course of time, can lead to success.

A final issue that Winne raised concerns the difficulty involved in a novice learner's development of a strategic plan for shifting tactics when studying in naturalistic settings. Often this critical issue has been overlooked in research and discussions of study strategies. Winne, like several other theorists (e.g., Weinstein & Mayer, 1986), made a distinction between learning strategies and tactics, with strategies referring to plans for shifting task-specific tactics during learning episodes. More often, theorists classify all systematic learning methods as strategies regardless of their level of task

specificity. Whatever the preferred label, study strategies or tactics typically are presented as universally applicable, without much consideration for contextual limitations that govern each one's effectiveness. In fact, study strategies and tactics work well with only certain tasks under specific conditions, and learners confronting unfamiliar tasks must figure out which strategy or tactic is most useful with that particular task. To accomplish this, novice learners need more than metacognitive skill in monitoring strategy outcomes and making alternative choices, they need specific information about the contextual conditions (i.e., conditional knowledge) and a strong sense of self-regulatory efficacy to sustain motivation in the face of extended periods of ambiguous or unfavorable feedback.

Winne adopted Carver and Scheier's (1990) closed-feedback loop model of self-regulation to explain self-monitoring findings of a study by Morgan (1985). This complex control theory model, which utilizes a metacognitive hierarchy of reference values, applies a learning strategy iteratively until self-monitoring indicates a specific reference value is reached. Self-regulatory control is then shifted to a new reference value. Morgan found that self-monitoring of time use during studying increased college students' study time but did not improve their course examination results. In contrast, self-monitoring the attainment of course objectives did improve students' final examination scores. Winne offered a complex interpretation of Morgan's results using Carver and Scheier's model, however, a much simpler account of self-monitoring is also possible (Zimmerman, Greenberg, & Weinstein, 1994). Behaviorists (Sultzer & Mayer, 1972) have argued that in order for feedback to be effective, it should focus directly on the specific outcome response. Study time was not the ultimate outcome sought in the Morgan study but rather was an interim process. When the students in the Morgan study self-monitored behavioral attainment of ultimate course objectives directly, they improved their course grades significantly.

Closed-feedback loop models of SRL have been criticized recently because of fundamental limitations in explaining proactive as well as reactive control of learning (e.g., Locke, 1991, 1994). For example, Bandura (1991, in press-a) pointed out that positive feedback discrepancies can not only confirm attainment of previously set goals in a closed control-loop sense but can also strengthen learners' sense of self-efficacy, which in turn may lead them proactively to set new challenging referential goals for themselves. These emergent changes in student goal setting from feedback outcomes are mediated directly by beliefs in self-efficacy (Zimmerman & Bandura, 1994; Zimmerman, Bandura, & Martinez-Pons, 1992). In addition, the feedback loop model has been criticized for saying relatively little about how people personally react to negative discrepancies. Some students develop better strategies and redouble their efforts to meet their internal standard, others lower their standard and become resigned to humbler aspirations, and still others self-defensively retain or even raise their standard but their motivation is undermined by growing despondency (Bandura, in press-a). To understand these individual differences in response to personal feedback, it is essential to know how it affects their sense of self-efficacy because these self-beliefs, in turn, regulate a variety of self-regulatory processes that influence performance, cognition, motivation, choice, and affect (e.g., anxiety and despondency).

Winne's thoughtful article raised important issues regarding the role of motivation, self-beliefs, self-monitoring, and strategic adaption during SRL. His questions and insights revealed not only the complexity of self-regulation but also the human side of it—the role of our self-doubts, false beliefs, unfortunate self-monitoring, and strategy choice dilemmas. Most importantly, his discussion revealed that self-regulation is not a generalized human trait, ability, or cognitive stage of development, but rather a complex interactive process involving not only metacognitive components but also motivational and behavioral components. Like other forms of human functioning, SRL is affected profoundly by variations in social–contextual variables, such as task features and setting conditions. Clearly there are many times and places when Winne's mythical student Pat will not choose to self-regulate studying despite its known advantages. To understand these limitations in self-regulated functioning, educational psychologists must direct their attention beyond metacognitive knowledge and skill to other issues, especially students' underlying sense of self-efficacy and personal agency.

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