METACOGNITION: THEORY OR CHAPTER HEADING?

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ABSTRACT: The four articles in this series are analyzed within the framework of Pintrich's classification system for metacognition, consisting of knowledge states, judgments and monitoring skills, and control processes. This scheme is used to locate the strengths and/or limitations of each article. A developmentally-based model is proposed to help integrate the conceptually diverse components of metacognition; to extend it to additional domains, such as motivation; and to argue for more longitudinal, interactive research in this field.

Since the four articles in this issue address different phenomena, use varied methodologies, and, by and large, ignore connections with alternative perspectives, they can be viewed—for the most part—as nonoverlapping segments of a broad-based chapter, perhaps a text, on metacognition. In this sense, they represent mini-theoretical stances on what may eventually constitute a more comprehensive model. Given the diversity in the four reviews, it is fair to conclude, at least at this stage of research and theory development, that it is premature to argue for metacognition's unified character, especially given the limited empirical base for several of its constituent parts. Nevertheless, the thrust of my remarks are directed in the opposite direction—that is, toward the long-range empirical and applied potential of metacognition as a unified theory.

In this commentary, I propose a classification system that attempts to encompass the four metacognitive perspectives presented in this volume; identify their major contributions either within, or outside of, that framework; propose an alternative model that hopefully provides greater theoretical integration and cohesiveness; and suggest research directions that address the possibility of conceptual linkages that might interrelate seemingly isolated, narrowly-defined metacognitive components.

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AN ANALYTIC FRAMEWORK

Pintrich, Wolters, and Baxter (in press) have provided a useful framework for classifying a variety of metacognitive phenomena. At the core, they distinguish three interrelated aspects of metacognition: knowledge, judgments and monitoring, and self-regulation. As first described by Flavell (1979), *metacognitive knowledge* refers to knowledge about cognition and is similar in structure and function to other kinds of knowledge in long-term memory . This knowledge is usually about person, task, and strategy variables and their interactions. The major research issue has been whether there are causal relationships between various forms of metacognitive knowledge and subsequent performance, especially the transfer of newly learned skills (Borkowski, Milstead, & Hale 1989).

Metacognitive judgments and *monitoring* reflect ongoing activities or processes that learners engage in while performing a task. Pintrich and colleagues cite ease of learning judgments, feelings of knowing, comprehension monitoring, and confidence judgments as major subcategories. Each activity has a rather long and solid history of predicting performance on a wide variety of learning and memory tasks. Their interrelationships and developmental antecedents, however, have been largely underexplored.

Self-regulation represents the highest level of metacognitive activity. Changing cognitive skills and strategies in response to new or changing task demands is my own favorite operational definition of self-regulation (Butterfield & Belmont 1977). Other labels used to describe orderly changes in cognitive processes and skills are self-control and executive functioning (Borkowski & Burke 1996). Examples of regulatory activities include planning, strategy selection and use, and resource allocation (Pintrich et al. in press). Pintrich et al. (in press) have accurately pointed out that regulatory processes are often dependent upon monitoring activities, with extant theories differing on the extent of their overlap (Schunk & Zimmerman 1994). I view monitoring as a critical component in self-regulation (Borkowski & Burke 1996).

USING PINTRICH'S FRAMEWORK TO LOCATE METACOGNITIVE RESEARCH

When the four articles in this issue are viewed from the perspective of Pintrich's classification system, each state or process can be located in terms of its fit within, or outside of, the metacognitive categories of knowledge, judgments and monitoring, and regulation. The "goodness of fits" range from Bartsch and Estes' work