



## Complex Relation Between Metacognition and Cognition

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### ABSTRACT

*The issue whether cognition and metacognition can be disentangled is not merely an academic one. In fact, metacognition draws on cognition. If metacognition is conceived as (knowledge of) a set of self-instructions for regulating task performance, then cognition is the vehicle of those self-instructions. These cognitive activities in turn are subject to metacognition, for instance, to ongoing monitoring and evaluation processes. This circular process of metacognitive and cognitive activities makes it hard to disentangle them in the assessment of metacognition. So this paper tries to understand the complex relation between cognition and metacognition. Here presenter tried to explain the complex relation between cognition and metacognition conceptually, strategically and strategic instructionally. In the end it could be concluded that the study of metacognition provides insight about the cognitive processes involved in learning and what differentiates successful students from their less successful peers.*

**Keywords : Relation, Metacognition, Cognition**

### Introduction

Most conceptualizations of metacognition have in common that they take the perspective of "higher-order cognition about cognition." There is a higher-order agent overlooking and governing the cognitive system, while simultaneously being part of it. This is the classical homunculus problem or Comte's paradox: One cannot split one's self in two, of whom one thinks whilst the other observes him thinking. The issue whether cognition and metacognition can be disentangled is not merely an academic one. In fact, metacognition draws on cognition. It is very hard to have adequate metacognitive knowledge of one's competencies in a domain without substantial (cognitive) domain-specific knowledge, such as knowledge about relevant concepts and theories in a domain, about intrinsic difficulties of a domain, and about what is irrelevant (Pressley & Gaskins, 2006). In terms of metacognitive skills, one cannot engage in planning without carrying out cognitive activities, such as generating problem-solving steps and sequencing those steps. Similarly, one cannot check one's outcome of a calculation without comparing the outcome with an estimation of it, or recalculating the outcome in another way.

### Cognition Vs. Metacognition

If metacognition is conceived as (knowledge of) a set of self-instructions for regulating task performance, then cognition is the vehicle of those self-instructions. These cognitive activities in turn are subject to metacognition, for instance, to ongoing monitoring and evaluation processes. This circular process of metacognitive and cognitive activities makes it hard to disentangle them in the assessment of metacognition. Occasionally, metacognition can be observed in students' verbalized self-instructions, such as "this is difficult for me, let's do it step-by-step" or "wait, I don't know what this word means." Metacognition, however, is not always explicitly heard or seen during task performance. Instead, it has often to be inferred from certain cognitive activities. For instance, doing things step-by-step may be indicative of planned behavior, although self-instructions for planning are not explicitly verbalized. Future research has to differentiate far more precisely between explicitly verbalized metacognitive knowledge and self-instructions, cognitive activities that are indicative of metacognition, and purely cognitive activity.

Despite their intertwined relation with cognitive processes, metacognitive skills cannot be equated with intellectual ability (Sternberg, 1998). There is ample evidence that metacognitive skills, although moderately correlated to intelligence, contribute to learning performance on top of intellectual ability. On the average intellectual ability uniquely accounts for 10 percent of variance in learning, metacognitive skills uniquely account for 17 percent of variance in learning, whereas both predictors share another 20 percent of variance in learning for students of different ages and background, for different types of tasks, and for different domains (Veenman, Wilhelm & Beishuizen, 2004; Veenman & Spaans, 2005). The implication is that an adequate level of metacognition may compensate for students' cognitive limitations.

### Cognitive vs. Metacognitive Strategies

Most definitions of metacognition include both knowledge and strategy components; however, there are a number of problems associated with using such definitions. One major issue involves separating what is cognitive from what is metacognitive. What is the difference between a cognitive and a metacognitive strategy?

Can declarative knowledge be metacognitive in nature? For example, is the knowledge that you have difficulty understanding principles from bio-chemistry cognitive or metacognitive knowledge? Flavell himself acknowledges that metacognitive knowledge may not be different from cognitive knowledge (Flavell, 1979). The distinction lies in how the information is used.

Recall that metacognition is referred to as "thinking about thinking" and involves overseeing whether a cognitive goal has been met. This should be the defining criterion for determining what is metacognitive. Cognitive strategies are used to help an individual achieve a particular goal (e.g., understanding a text) while metacognitive strategies are used to ensure that the goal has been reached (e.g., quizzing oneself to evaluate one's understanding of that text). Metacognitive experiences usually precede or follow a cognitive activity. They often occur when cognitions fail, such as the recognition that one did not understand what one just read. Such an impasse is believed to activate metacognitive processes as the learner attempts to rectify the situation (Roberts & Erdos, 1993).

Metacognitive and cognitive strategies may overlap in that the same strategy, such as questioning, could be regarded as either a cognitive or a metacognitive strategy depending on what the purpose for using that strategy may be. For example, you may use a self-questioning strategy while reading as a means of obtaining knowledge (cognitive), or as a way of monitoring what you have read (metacognitive). Because cognitive and metacognitive strategies are closely intertwined and dependent upon each other, any attempt to examine one without acknowledging the other would not provide an adequate picture.

Knowledge is considered to be metacognitive if it is actively used in a strategic manner to ensure that a goal is met. For example, a student may use knowledge in planning how to approach a math exam: "I know that I (person variable) have difficulty with word problems (task variable), so I will answer the computational problems first and save the word problems for last (strategy variable)." Simply possessing knowledge about one's cognitive strengths or weaknesses and the nature of the task without actively utilizing this information to oversee learning is not metacognitive.

#### Metacognition and Cognitive Strategy Instruction

Although most individuals of normal intelligence engage in metacognitive regulation when confronted with an effortful cognitive task, some are more metacognitive than others. Those with greater metacognitive abilities tend to be more successful in their cognitive endeavors. The good news is that individuals can learn how to better regulate their cognitive activities. Most often, metacognitive instruction occurs within Cognitive Strategy Instruction programs.

Cognitive Strategy Instruction (CSI) is an instructional approach which emphasizes the development of thinking skills

and processes as a means to enhance learning. The objective of CSI is to enable all students to become more strategic, self-reliant, flexible, and productive in their learning endeavors (Scheid, 1993). CSI is based on the assumption that there are identifiable cognitive strategies, previously believed to be utilized by only the best and the brightest students, which can be taught to most students (Halpern, 1996). Use of these strategies have been associated with successful learning (Borkowski, Carr, & Pressley, 1987; Garner, 1990).

Metacognition enables students to benefit from instruction (Carr, Kurtz, Schneider, Turner & Borkowski, 1989; Van Zile-Tamsen, 1996) and influences the use and maintenance of cognitive strategies. While there are several approaches to metacognitive instruction, the most effective involve providing the learner with both knowledge of cognitive processes and strategies (to be used as metacognitive knowledge), and experience or practice in using both cognitive and metacognitive strategies and evaluating the outcomes of their efforts (develops metacognitive regulation). Simply providing knowledge without experience or vice versa does not seem to be sufficient for the development of metacognitive control (Livingston, 1996).

#### Conclusion

The study of metacognition has provided educational psychologists with insight about the cognitive processes involved in learning and what differentiates successful students from their less successful peers. It also holds several implications for instructional interventions, such as teaching students how to be more aware of their learning processes and products as well as how to regulate those processes for more effective learning.

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