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Revisiting **Flavell's** Metacognition Theory for Metacognitive Responsiveness

Flavell'in Üstbiliş Kuramının Üstbilişsel Duyarlılık Açısından Yeniden **Gözden Geçirilmesi**

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ABSTRACT: Flavell's theory of metacognition was innovative at the time for its promising practicality. However, research findings that report inconsistencies in metacognitive trainings' outcomes and insufficiencies of translating the theory into mainstream classrooms have accumulated since then. In this sense, there may be a need to revisit metacognition theory for its practicality and credentiality. From a phenomenological perspective, this paper first describes the fundamental tenant of theory; thinking, and whether metacognition theory recognizes the nature of thinking. To manage thinking, it should be stimulated first. In other words, a sensitivity towards a stimulus that is metacognitive responsiveness needs to be raised to initiate the attendance of higher order thinking. Thinking and metacognitive responsiveness pertain to personal relevance, attentiveness, interest, previous experiences, tools for thinking, features of tasks, and the nature of social interactions. Therefore, it is important to present the stimulus designed or adapted to initiate individuals' thinking or metacognitive responsiveness. In this paper, Flavell's theory of metacognition was revised to embrace metacognitive responsiveness explicitly, and it is highlighted that practical implications need to focus on materials to initiate metacognitive responsiveness.

Keywords: Metacognition, metacognitive responsiveness, thinking, phenomenology.

ÖZ: Flavell'in üstbiliş teorisi, umut vaadeden biçimde uygulanabilir olması sebebiyle dönemi için yenilikçiydi. Ancak, üstbilişsel eğitimlerin sonuçlarındaki tutarsızlıkları gösteren ve üstbiliş uygulamalarının sınıflarda etkin olmamasına dair araştırma bulguları zamanla artmıştır. Bu bulgular, üstbiliş kuramının uygulamadaki tutarsızlık ve pratikliğini açıklayabilme yeterliliğinin gözden geçirilmesi ihtiyacını doğmuştur. Bu çalışma, kuramın temel öğesi olan düşünme kavramı tanımlayıp, üstbiliş kuramının düşünmenin doğasını yansıtıp yansıtmadığını fenomenolojik bir bakış açısıyla ele almaktadır. Çünkü düşünmek için öncelikle düşünmenin teşvik edilmesi yani bir uyarana karşı bilinçli bir duyarlılığın olması gerekir. Düşünme ve üstbilişsel duyarlılık dikkat, ilgi, önceki deneyimler, düşünme araçları gibi kişisel özellikler ile görevlerin özellikleri ve sosyal etkileşimlerin doğası ile ilgilidir. Bu anlamda, uyaranın bireylerin düşünmesini veya üstbilişsel duyarlılığını aktive edecek şekilde olması beklenir. Bu çalışmada, Flavell'in üstbiliş teorisi, üstbilişsel duyarlılığı açık bir şekilde yansıtır şekilde sunulmuş ve uygulamaların üstbilişsel duyarlılığı sağlayabilecek materyaller kullanılması gerekliliğini vurgulanmıştır.

Anahtar kelimeler: Üstbiliş, üstbilişsel duyarlılık, düşünme, fenomenoloji.

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Flavell's (1979) theory of metacognition was innovative at the time, and it has been studied extensively in many disciplines including education. As Flavell (1979) argued that metacognition plays a significant role on "reading comprehension, writing, language acquisition, attention, memory, problem solving" (p. 906), research studies examined Flavell's (1979) question: "how much good does cognitive monitoring actually do us in various types of cognitive enterprise?" (p. 910). In this realm, most studies confirmed favorable findings. Research found that metacognition is a tool for learning more efficiently (Kerndl & Aberšek, 2012), and it may be the most important predictor of learning (Veenman, 2016; Wang et al., 1990). As individuals can perform their cognition more strategically and efficiently (Gourgey, 1998), metacognition can be a significant factor for the distinction between low and high achievers (Paris & Jacobs, 1984; Pogrow, 2004). It may also impact achievement (Pimvichai et al., 2019) or help develop other desirable outcomes such as critical thinking, problem solving, and decision making (Pimvichai et al., 2019).

There is also evidence that metacognition can be taught (Cross & Paris, 1988; Takallou, 2011; Tanner, 2012; Zhang & Seepho, 2013), and following such trainings, individuals' awareness, responsibility-taking, and performances improve (Boulware-Gooden et al., 2007; Curwen et al., 2010; Veenman et al., 2006). However, not all individuals can benefit from metacognition training in the same manner for several reasons, for example, proficiency (Ozturk & Senaydın, 2019), extant metacognitive competencies, or personality (Ozturk, 2021). It may also be because metacognitive training where designers impose their judgements about audience's competencies or needs disregard audience's characteristics, or they may lack or ignore a crucial element, the input. While the potential reasons of insufficiencies are open to exploration, such trainings may continue running the risk of being unproductive for metacognition development (Efklides, 2008).

Problem Statement and Rationale to the Study

Research studies on metacognition training keep accumulating; however, they bear some problems. First, such initiatives mostly focus on cognitive or metacognitive strategies (Efklides, 2014); however, they may ignore that metacognitive growth might not necessarily accompany strategy execution (Efklides, 2009; Melot, 1998). Also, although a component of metacognition bears metacognitive experiences, it is not explained well (Efklides, 2009). Indeed, how and why individuals engage in such concurrent higher order thinking is the least explored domain (Efklides, 2008; Meijer et al., 2013).

Flavell (1979) defined metacognitive experiences as instances where highly conscious thinking is activated. They are self-initiated (Aşık & Erktin, 2019) cognitions where individuals test and modify metacognitive knowledge as well as practice metacognitive skills for goals (Flavell, 1979). Constituting an exclusive domain in the theory, metacognitive experiences may not be subsumed under either metacognitive knowledge or strategies; however, they can be related to both (Flavell, 1979). In theory, when individuals are exposed to or meet metacognitive experiences, metacognitive knowledge and metacognitive strategies relate, and regulatory cognitions are executed (Efklides, 2009). This assumption, however, cannot explain how and why exposure to

or meeting a metacognitive experience necessarily activates individuals' higher order thinking, if at all. Moreover, if being exposed to or meeting metacognitive experiences would be sufficient to practice metacognitive knowledge and regulation, then there would not be variations in metacognitive adequacy. That is, there must be another variable that motivates individuals' recognition and responsiveness to a metacognitive experience.

Each metacognitive experience holds distinctive characteristics, contextual cues, or task features (Efklides, 2014) and similarly, each agent displays distinctive characteristics such as competence in a domain, goals, interest, as well as mood (Efklides, 2006a, 2006b). The mis/match between any elements of these, therefore, may create distinctive outcomes. In this sense, although a group of individuals is exposed to the same stimulus which is assumed to potentially initiate higher order thinking, some may be indifferent to it because the stimulus is for example, dull for few. As Branigan and Donaldson (2020) found although the classroom teacher presented opportunities for metacognitive experiences, their learners were poorly motivated to engage in those because they were not interested in the topic. Also, some individuals may think that metacognitive acts are tiresome or time-consuming, and they may restrain from them (Ozturk, 2019). Moreover, as Washburn et al. (2005) found, individuals may respond to uncertainty differently depending on their confidence and/or personality. Therefore, even though exposed to the same stimulus or experience, some individuals may experience faulty monitoring or control over their cognitions, or they may even fail it (Efklides, 2014; Garner & Alexander, 1989). In such cases, metacognitive sensitivity and in relation, responsiveness might be one of the factors that ensure monitoring or produce action slips and cognitive failures (Washburn et al., 2005). In the following, the propositions of revisiting Flavell's (1979) metacognition theory will be discussed in relation to metacognitive responsiveness.

Methodological and Philosophical Orientations

This paper approaches Flavell's metacognition theory from a phenomenological perspective to describe its nature, again. As Madison (2009) stated, phenomenology may be a descriptive enterprise that pertains to perceiving and thinking as well as willing and doing. Phenomenology, to Husserl, is a reflective act, and it cuts across the flow of consciousness to define its essential structures: "its intentional nature, as the subjective condition for the possibility of all thinking" (Marinay, n.d., p.1).

Regarding the nature of metacognition, transcendental phenomenology was employed to understand the phenomenon. Transcendental phenomenology relates to the Kantian philosophy and emphasizes that all objects are accessible to the consciousness. Indeed, "consciousness is always consciousness of" (Edie, 1964, p.58) something, and individuals may direct their awareness towards physical or mental objects (Yee, 2019). However, consciousness may relate to the objects differently as it is intentional; individuals "think of the things… specially those significant to us" (Marinay, n.d., p.2). While Flavell (1979) defined metacognition as thinking about thinking, one's consciousness first needs to focus on the object of thinking intentionally and personally.

Phenomenology also pertains to involving into a world of experiences within reach and investigating it into a deeper subjective reality. As Husserl (1975) argued, reality becomes reality when the individual can present it to himself and confirm it. That

is, the intentional content has a meaning, and the object, thereby, has a meaning for the individual. Thus, "the intentional content transcends the conscious act … that has this intentional content" (Yee, 2019, p.3). Intentional act deals with perception and several ways of thinking or reasoning about it because as Yee (2019) stated, the "intentional act, intentional object and intentional content are correlated" (p.3). However, each person may objectify the same object "differently with different clarity, manner of apprehension and so on" (Yee, 2019, p.9). Thereby, one may think or reason about thinking differently, yet intentionally.

From the phenomenological perspective, the author's intuition was the first step in understanding metacognition and her consciousness is a process of fulfilling meaning and knowing the object (Yee, 2019). Phenomenology analyzes the object via self-insights, subjective perceptions of the object, and self-reflection (Yee, 2019). In this sense, I leaned on my own experiences, awareness, readings, discussions, as well as research experiences, and engaged in reasoning to describe *what it is like to think about thinking*. During this process, I also embraced Epoche to free my understandings from the captivity of my familiarity and unquestioned acceptance of the theory and a-priori clarifications. I could, therefore, approach it with practical reasoning.

Theoretical Framework

Nature of Thinking

Metacognition is a unique phenomenon for every individual who experiences a thinking-self. Regarding the problem of this study, metacognition theory may benefit from a description and discussion of the nature of thinking, first. In this section, philosophers' definitions of thinking with a phenomenological, rationalist, or existentialist stance are presented as their focus is on experiencing thinking for the self just as metacognition does.

One may not be aware of thinking and how it happens unless he thinks (Aydoğan, 2019). When one starts to think about himself, they learn thinking (Aydoğan, 2019; Yurt, 2018). As Heidegger proclaimed, thinking is a response to a stimulating potential to think (Yurt, 2018), and individuals do tend to think about something when it has a personal meaning or relevance to its essence. In this sense, attentiveness, interest (Schopenhauer, n.d. as cited in Aydoğan, 2019), and selectivity may be important pillars of thinking (Aydoğan, 2019). Moreover, Vygotsky (1987) similarly argued that isolating affective and volitional aspects of consciousness from thinking may diminish an opportunity for a causal explanation of thinking as well as ignore a dynamic system of affective and intellectual processes (Vygotsky, 1987). That is, when thinking is eliminated from the "full vitality of life, from the motives, interests, and inclinations of the thinking individuals" (Vygotsky, 1987, p.50), it transforms into "a useless epiphenomenon" (Vygotsky, 1987, p.50).

Thinking may also be acting in harmony with the essence. Zöller (1992) stated that self-awareness is a consciousness "in actu" (p.436) and may collapse the distinction between the subject of thinking and the self as object. Self-consciousness, on the other hand, is "the consciousness of the mind's own activity of thinking" (Zöller, 1992, p.436). To manage an autonomous, organized, and systematic set of cognitions for *I*

think (Aydoğan, 2019; Başerer & Duman, 2019), one needs to orient themselves to rational thinking (Kant, n.d. as cited in Aydoğan, 2019), or the tools of thinking.

Guitton (2011) who echoed Kant years later stated that thinking emerges when one does put aside their predispositions of comprehension, presuppositions, prejudices, habits, or expectations aside as well as answer questions using logic. For Guitton (2011), thinking may not be separated from reasoning and conflicting ideas. Indeed, both conflicting ideas to some extend are true and confrontation initiates thinking. At this point, he refers to Comte and states that "one represents systematization, two always represents an agreement, and three always records a progression" (Guitton, 2011, p.87). That is, when individuals experience an intellectual conflict in themselves or with others, they engage in reasoning and comprehend the rationale for their choice over another in relation to one's essence.

These insights on thinking propose that thinking can pertain to the following factors: the stimulus and the tools for thinking. The stimuli (e.g., problems, challenges, or goals) should relate to personal relevance (i.e., meaning, essence, individuality), attentiveness (i.e., attention, willingness, enthusiasm, responsiveness), or interest (i.e., choice, motives, inclinations); therefore, they create a need to engage in thinking. However, the stimulus may not always necessarily help individuals think properly unless they possess the tools for thinking (i.e., comprehension, reasoning, cognitive skills, and language). For example, language itself may present intellectual stimuli and provide "the words and concepts with which thought evaluates and regulates itself" (Tishman & Perkins, 1997, p.371). Helping individuals describe cognitions via a specific set of vocabulary, the language of thinking requires one to reason, develop an idea, solve a problem, reject an idea, probe an assumption, look for evidence, and identify reasons (Tishman & Perkins, 1997). Still, those two factors may become significant once individuals perceive the stimulus *worthy* of thinking or utilizing time and effort to think about it. That is, without *a legitime reason*, thinking may not emerge. In the following section, dissemination of metacognitive responsiveness which embraces sensitivity to metacognitive experiences will be provided regarding the nature of thinking after a brief description of metacognition theory is presented.

Metacognition Theory

Flavell (1979) stated that cognitive regulation depends on metacognitive knowledge, experiences, goals, tasks, and strategies. In his theory, metacognitive knowledge pertains to declarative (what), procedural (how), and conditional (when and why) knowledge about variables that influence thinking. While declarative knowledge pertains to an awareness of self, task, and strategies to manage cognitive acts, procedural knowledge pertains to knowing how skills operate in the phase of task completion. Conditional knowledge, on the other hand, pertains to knowing when and why to use strategies (Flavell, 1979; Jacobs & Paris, 1987; Pintrich et al., 2000; Veenman et al., 2006). Metacognitive strategies pertain to regulation of cognitions. These include planning, monitoring, regulation, as well as evaluation of cognitive processes and performances (Schraw, 1998).

Since the introduction of metacognition theory, focus has been mostly on metacognitive knowledge and strategies (Efklides, 2014). While even metacognitive experiences get little attention (Efklides, 2008, 2009; Meijer et al., 2013), metacognitive

responsiveness has not been theorized and examined adequately. However, metacognitive responsiveness might be an important domain for metacognitive engagement in the sense that it initiates thinking. In the following metacognitive adequacy and metacognitive experiences will be discussed to path metacognitive responsiveness.

Metacognitive Adequacy

Veenman et al. (2006) argued that individuals might show variations in metacognitive adequacy for several reasons including social interactions, opportunities of acquiring metacognition, and attitudes to obtain such a repertoire. Some individuals might be metacognitively competent, some might lack sufficient adequacy to perform metacognition, or they may lack it, at all. Some individuals who are competent with metacognition may "spontaneously pick up metacognitive knowledge and skills to a certain extent" (Veenman et al., 2006, p.9) from individuals around them. There might also be others who develop such competencies on their own although the opportunities are scarce (Veenman et al., 2006).

Moreover, there might be individuals who suffer from a deficiency of metacognition (Veenman et al., 2006). Individuals with availability deficiency do not possess enough metacognitive knowledge and cannot exercise regulatory strategies effectively whereas individuals with production deficiency may have some amount of metacognitive knowledge or skills. Production deficiency may emerge because of for example anxiety, task-difficulty, lack of motivation, or individuals' inability to see the relevance of metacognition in different situations (Veenman et al., 2006).

Regarding Veenman et al.'s (2006) categorization of metacognitive adequacy, it is important to elaborate on how variations in metacognition emerge, and answer the following questions, e.g., What makes novices attend to an intellectual stimulus in the environment and handle it strategically? What kind of stimuli are individuals attentive to? Why and how do they interact with such stimulus? Why do some individuals observe metacognitive models and help themselves develop metacognition while some may suffer from either form of deficiency? For these questions, it is important to elaborate on metacognitive responsiveness and experiences.

Metacognitive Experiences

Metacognitive experiences are "the interface between the person and the task" (Efklides, 2008, p.279) where highly conscious thinking occurs (Flavell, 1979). They are concurrent metacognition working in memory, specific in scope, and cognitively as well as affectively charged (Efklides, 2006a). Metacognitive experiences pertain to one's (a) awareness of task demands, fluency of cognitive processing, and the progress towards the goal, (b) feelings of knowing, familiarity, confidence, difficulty, and satisfaction, (c) judgements of learning and estimate of time, effort, and solution correctness, as well as online task specific knowledge (Efklides, 2008; Pimvichai et al., 2019).

Metacognitive Responsiveness

While metacognitive experiences drew little attention and effort of investigation (Efklides, 2008, 2009; Meijer et al., 2013), metacognitive responsiveness lacks

theoretical understandings. To understand the nature of metacognitive experiences, it may be effective to first describe metacognitive responsiveness. Meijer et al. (2013) recently defined metacognitive responsiveness as individual's sensitivity to metacognitive experiences, general awareness of metacognition and its importance, and curiosity to learn about it. Meijer et al. (2013) related metacognitive responsiveness to thinking agent, help coming others, and the task's features (Figure 1).

The agent domain pertains to different dynamics. It may be individuals' recognizing and responding to personally meaningful intellectual stimuli (i.e., I.S.). Such stimuli may appeal to individuals' goals or plans; therefore, it may be worth investing effort and time. Most of the time, such stimuli are interesting and motivating for individuals to pay attention to and interact with it (Meijer et al., 2013). In this regard, research that emphasizes the role of personality, confidence ratings, or approaches to metacognitive experiences may help understand the dynamics of the agent domain in studying metacognitive responsiveness.

Others may pertain to the help that individuals may turn to for their metacognitive acts. Such help may be in the form of feedback from experts or peers, cooperation with others for goal attainment, or coregulation or shared regulation of the cognitive process (Meijer et al., 2013). Depending on the availability or lack of help, one might get attentive to the stimuli and engage in metacognitive experiences or restrain from it. That is, although individuals may be attentive to the intellectual stimuli, they may not engage in metacognitive acts or ultimately, stop their acts when they cannot find sufficient help for the task completion. It may be that classroom metacognitive research produced favorable outcomes as they utilized the benefits of others indirectly. That is, when people know that they can turn to a social agent for help, they feel secure and engage in metacognitive experiences. However, research may not be as organic as the scenarios in mainstream classrooms. Especially, when the classroom instruction lacks pedagogies of metacognition and teachers do not teach for it, students might suppress their metacognitive attitudes.

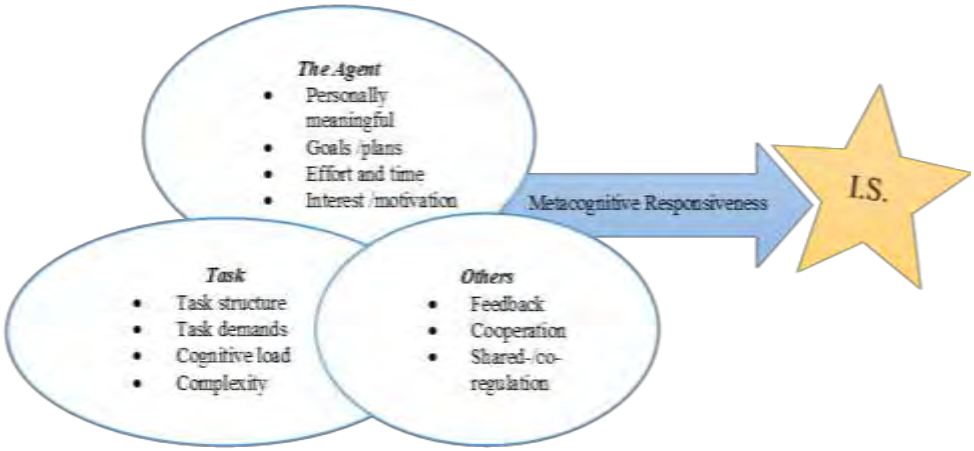
The final category -task features- may also determine individuals' responsiveness to the stimulus of a metacognitive experience. Task features may pertain to task demands, structure, cognitive load, and complexity. These factors may filter individuals' recognition and responsiveness to a metacognitive experience (Meijer et al., 2013). It may be only after individuals engage in highly conscious thinking when they decide that they can deal with the task demands on their own or with help. That is, they may confirm that they have skills to manage task complexity or demands or the cognitive load is manageable for them. Although exposed to the same stimulus, not all individuals may react to it in the same way; that is, they may not get attentive to and/or think about it strategically as the cognitive load might be beyond their levels or they may not possess cognitive tools to manage task's complexity.

To elaborate on the components of metacognitive responsiveness and its functions, Figure 1 may be interpreted. When the intellectual stimulus is for example, personally meaningful, interesting, and appeals to one's goals, one might get sensitive towards and respond to it; that is, they may engage in a metacognitive experience where the stimulus is the object of thinking. However, another individual who is also attentive, interested, and motivated for the same stimulus might not engage in higher order thinking because s/he might think that they cannot manage the task demands without

help. On the other hand, when one is presented with two tasks, e.g., A and B, s/he can get responsive to the less cognitively demanding one (B) although s/he is interested in A and can work with others because s/he does not want to put time and effort into such a cognitively demanding one at the time.

Figure 1

Metacognitive Responsiveness



Moreover, one might seem engaged in the stimulus; still, it might not be a metacognitive process, yet a habitual one due to, for example, the routine task demands or memory-based functions. It is also possible for some individuals to ignore the stimulus of metacognitive experiences although the task is easy. Or else, although there is help because individuals are not motivated to engage in such an experience at the time, they may be indifferent to engage in higher order thinking.

Recognizing metacognitive responsiveness exclusively is important to identify what kind of stimuli initiate thinking and how they lead to a metacognitive experience, if at all. While Meijer et al. (2013) relate metacognitive responsiveness to the sensitivity towards metacognitive experiences, it may also be a sensitivity towards the stimulus that may initiate metacognitive experiences, still not necessarily. Theorizing metacognitive responsiveness is important to understand how the theory works and more importantly to transmit its promising proposals to practitioners.

Discussions and Conclusion

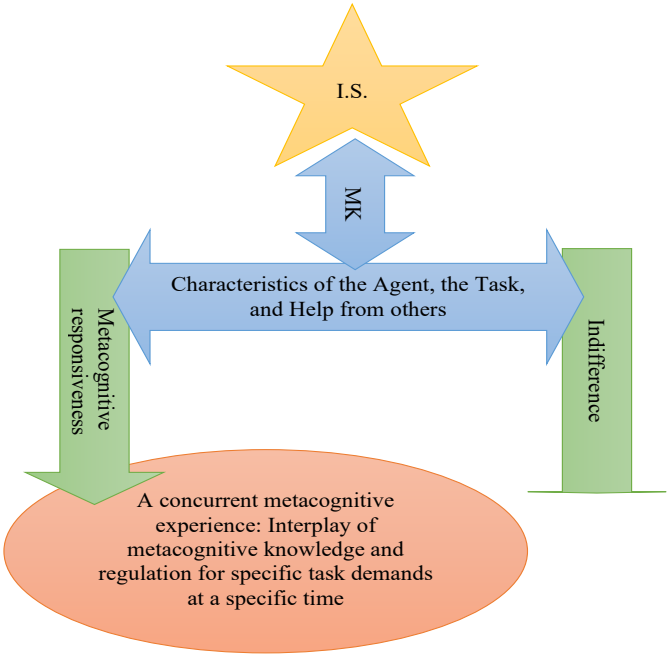
This paper argues that Flavell's (1979) metacognition theory needs a revision for its inclusion of metacognitive responsiveness regarding the variations of individuals' metacognitive adequacies and distinctions in metacognitive trainings' outcomes. In Flavell's (1979) seminal paper, metacognition is defined as thinking about thinking, and its components pertain to metacognitive knowledge, metacognitive strategies, metacognitive experiences, as well as task demands and goals. However, it may lack some locus regarding thinking. In this model, while the theory proposed that thinking is a meta-level act, how individuals' first level thinking is activated may be ignored or taken for granted, easily. When individuals do not recognize the stimulus in the environment or when they do not hold a valid reason to utilize their cognitive tools (i.e., when they are not metacognitively responsive), a meta-level of thinking may not emerge.

Metacognitive responsiveness, as Meijer et al. (2013) defined, pertains to the individual's sensitivity to metacognitive experiences. To ensure that individuals engage in a metacognitive experience, they need to think, or their thinking is to be stimulated by at least one of the features of the stimuli. That is, the stimulus should relate to personal relevance (e.g., attentiveness, interest, previous experiences), tools (e.g., skills or language), task features (e.g., structure, demands, cognitive load, and complexity), and others' helps (e.g., social interactions, feedback, cooperation, coregulation or shared regulation); therefore, individuals may become sensitive towards it. When exposed to or meet intellectual stimulus, individuals may first filter it through their metacognitive knowledge (MK on Figure 2) and their metacognitive responsiveness may direct them to utilize metacognitive regulatory strategies for a concurrent experience or to stay indifferent. In this sense, metacognitive responsiveness may mimic a gatekeeper where the evaluation of the stimulus is already done and intentionality for a metacognitive experience is already created.

On the other hand, there may be also cases where individuals may be pushed to engage in cognitive acts for several reasons such as placement test, grades, or class-participation. Without individuals' autonomous responsiveness, externally initiated metacognitive acts may not help with the metacognitive competencies, efficient regulation, or habituation. At such instances individuals may not recognize the necessity or relevance of employing metacognition (Veenman et al., 2006) and end up faulty control or monitoring.

Figure 2

A Model for Metacognition



Instructional Implications

A ground-breaking theory, metacognition, has been studied in education, extensively. Its benefits and methods of teaching were reported soon after the theory was proposed. However, a revisit to Flavell's (1979) theory of metacognition for

metacognitive responsiveness can help eliminate its inconsistencies and impracticality especially in mainstream classrooms. As Baker (2017) stated metacognitive competencies in research and mainstream classrooms are not similar; students in mainstream classrooms may not have or execute metacognitive competencies as students in research classrooms. It may be because while instruction in research classrooms is designed to the optimal for metacognitive development, mainstream classrooms may lack such a drive or some of its elements.

To manage inconsistencies among metacognition trainings' outcomes or minimize metacognitive inadequacies among the individuals, it is important to implement instruction that embraces metacognitive responsiveness explicitly beyond other components of metacognition. As Seel et al. (2017) emphasized, "instruction is the 'stimulus' and learning is the 'response' (p.3). For instructional designs aiming at an optimal learning environment with specific arrangements of teaching, learning can be personalized. To Molenda et al. (2003), instructional design pertains to the execution of some principles and practices; therefore, instructional materials, implementation, and evaluation can be developed "in a consistent and reliable fashion" (p.574). However, each learning environment may be different (Seel et al., 2017), and the accuracy of implementation for goals, empirical evidence for goal mastery, and the accuracy of execution of the interventions (Seel et al., 2017) should be ensured. For teaching metacognition, previous research identified some teaching methods. They may include explicit teaching of metacognition (Book et al., 1985; Duffy, 2002; Veenman et al., 2006), modelling metacognitive acts (Duffy, 1993; Duke & Pearson, 2008; Veenman et al., 2006), holding metacognitive discussions (McDevitt & Ormrod, 2016), sharing responsibilities with students for metacognitive acts (Perry et al., 2002), providing students with instruction aids for metacognitive acts (Kolencik & Hillwig, 2011), having students think aloud their metacognitive acts, having students collaborate for metacognitive acts (Klingner & Vaughn, 1998), encouraging and assessing students' independent metacognitive acts (Papleontiou-louca, 2003; Pressley & Afflerbach, 1995), as well as having students do self-assessment (Afflerbach & Meuwissen, 2005; Kolencik & Hillwig, 2011). Although these practices exist, there is still a lack of evidence of how the instructional design is contextualized to initiate participant's metacognition development.

Designing or selecting materials constitute a key component of numerous instructional designs (e.g., Dick-Carey model, ASSURE, CASCADE, Smith-Ragan model, or the Bates model) and they may help with the contextualized instruction. To McAlpine and Weston (1994), components of a typical instructional model include instructional design, content, presentation of the materials, and language. In their categorization, content pertains to the knowledge structure of the domain including "value of content, content accuracy, comprehensiveness, integration, objective presentation/bias, and recency" while language pertains to semantic and syntactic structures including "choice of vocabulary, complexity of sentence structures, verbs, redundancy, transitions, consistency, clarity, conciseness, and appropriateness for audience" (McAlpine & Weston, 1994, p. 22). In this sense, as Seel and colleagues (2017) also argued, the accuracy of implementation may be limited to some factors including complexity of the intervention, materials and resources, and participants'

characteristics; however, research studies do not explicate materials' selection criteria and use for participants' metacognitive reactions or responsiveness. Therefore, identifying instructional practices for metacognition trainings may not guarantee presentation and stimulating characteristics of the materials. Practically, lack of elaboration on this aspect may induce partial success of such trainings for a limited audience, if not teachers' pedagogies of metacognition.

It is important to recognize and evaluate the attributes of instructional materials for metacognition instruction. As McAlpine and Weston (1994) highlighted, it is important to identify whether the material meets a definite need and understand the audience's extant competencies, readiness, attitudes, as well as culture, and the same notion applies for metacognition instruction. First, teachers need to do an assessment of students' extant metacognitive (Ozturk, 2017), cognitive, and language competencies, as well as potentials of social interactions to set a system for metacognition development. Because of individual differences in these domains, standardized materials might not be effective to initiate a sensitivity towards thinking and responsiveness to higher order thinking, at all. In this sense, teachers also need to assess students' interest, motives, drives, and inclinations to choose more personalized materials because variations in these personal variables may cause variations in metacognitive sensitivity and responsiveness; thereby, metacognitive competencies. It may be that different iterations of the materials or intellectual stimuli should be available for different students' use to help them develop competencies sufficiently.

Designing or choosing the materials or using the language that holds intellectual potential is important to initiate metacognitive responsiveness. Unless metacognitive responsiveness is taken for granted, instructional techniques that research highlights may not support metacognition development, or social environments and agents' influences may be limited in students' metacognitive intake. Still, metacognition is a personal bearing with unique features, and practitioners should seek ways to individualize metacognition practices even in groups.

Conflicts of Interest

I have no conflict of interest to disclose

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Nesrin Ozturk studied for her BA and MS at Middle East Technical University. A Fulbright scholar, Nesrin received her doctoral degree in Reading Education from the Department of Curriculum and Instruction, University of Maryland, College Park.

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