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Review Article

An Analysis of Teachers' Metacognition and Personality

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Abstract

Variations in metacognitive competence may stem from various factors including observing or interacting with metacognitive models or manifestations of individual differences, including personality. To understand the phenomena, this study examined the relation of metacognition and personality traits (Five Factor Model). Data were collected via MAI and BPTI via survey research method. Results confirmed that metacognition does not change by teachers' gender, age, undergraduate degree, educational level, and teaching experience. Openness to Experience significantly correlated with and predicted metacognitive knowledge. While Agreeableness and Openness to Experience correlated with metacognitive regulation, Agreeableness predicted metacognitive regulation, significantly. Educational implications pertain to either teaching metacognition or incorporating characteristics of related personality traits.

Keywords: metacognition, personality, FFM, teacher, survey research.

Introduction

Metacognition pertains to thinking about thinking (Flavell, 1979; Veenman, Van Hout- Wolters, & Afflerbach, 2006). According to Flavell (1979), actions and interactions of metacognitive knowledge, metacognitive regulation, and metacognitive experiences control cognitions. Metacognitive knowledge pertains to self, task demands, goals, and strategies. Such knowledge can be categorized as declarative (what), procedural (how), and conditional (when & why) knowledge. Metacognitive strategies, on the other hand, help perform regulatory control over cognitions (Baker & Brown, 1984; Kuhn, 2000) by planning, monitoring, regulating, and evaluating. Metacognitive experiences are also crucial to predict metacognitive knowledge and regulation (Flavell, 1979) because they set highly conscious thinking experiences.

Veenman et al. (2006) argued that individuals may show variations in metacognitive adequacy. Most individuals "spontaneously pick up metacognitive knowledge and skills to a certain extent from their parents, their peers, and especially their teachers" (p. 9). Some other individuals, on the other hand, might successfully utilize sparse opportunities and develop a sufficient competency of metacognition. Veenman et al. (2006) also noted that some individuals might suffer from availability deficiency or experience production problems. Individuals with availability deficiency do not possess sufficient amount of metacognitive knowledge; therefore, they cannot practice regulatory strategies, effectively. On the other hand, individuals with production deficiency might have some amount of metacognitive knowledge or skills; however, they fail to use metacognition for various reasons including for example, anxiety, or test- or task- difficulty, lack of motivation, or inability to see the relevance of metacognition in different situations (Veenman et al., 2006).

Various studies examined the effects of metacognition instruction on learning or performance. Literature provides ample examples for beneficiary impacts of metacognition on learning or performance following such instructional practices. However, it is important to recognize that effectiveness of instruction does not solely depend on instructional practices (Duffy, 1993, 2002). Rather, instruction's effectiveness might also be affected by teachers' expertise in delivering metacognition instruction and having learners practice it sufficiently (Author, 2016, 2017). For this reason, in the following available research findings will be presented shortly.

Teachers' Understanding of Metacognition and Instructional Competency

Almost 40 years after the theory proposed, Veenman et al. (2006) noted that teachers' metacognition might be very limited. Few available research studies in this realm (e.g. Fisher, 2002; Kerndl & Aberšek, 2012; Author, 2016, 2017; Perry, Hutchinson, & Thauberger, 2008; Thomas & Barksdale-ladd, 2000) reported pessimistic findings. That is, (pre- or in-service) teachers either cannot define metacognition or their definition is very superficial and limited. Moreover, as the inquiries of metacognition instruction deepen, researchers found that teachers fail either to plan their instruction for metacognition (Author, 2016, 2017) or to teach metacognition in their classrooms (Kerndl & Aberšek, 2012; Perry et al., 2008).

Problem and Purpose of the Research

Veenman et al. (2006) emphasized the importance of ample social interactions or educational opportunities for acquiring a competence with metacognition; however, it is also important to consider individuals tendencies to obtain and even to practice such a repertoire. Veenman et al. (2006) proposed that metacognition "need not be studied in splendid isolation" just like "[l]earning does not take place in a void, neither does metacognition" (Veenman et al., 2006, p.10).

Similar to the argument that individuals' learning orientations and approaches to learning may be "partially determined by their personality" (Duff et al., 2004, p.1918) or can be considered as a component of personality (Furnham, Jackson, & Miller, 1999); teachers' metacognitive orientations may also be determined by their personality. In the presence of previous pessimistic findings regarding metacognition instruction in practice, it is important to understand potential factors that might facilitate teachers' tendencies of metacognition. Taking the initiative in this area, this study will therefore examine the following;

1. whether teachers' metacognition change by a) gender, b) age, c) undergraduate major, d) level of education, and e) teaching experience,
2. whether teachers' metacognition correlate with personality traits, and
3. whether teachers' metacognition can be predicted by personality traits.

Literature Review

This study developed on the understanding and potential educational implications of individual differences that stakeholders bring to learning environments. Specifically, personality traits will be elaborated in the following as it is what makes *individuals* and might create different learning outcomes following standardized instructional procedures.

Personality

Relatively stable and important aspects of "self" pertain to personality (Maltby, Day, & Macaskill, 2007). The Five Factor Model (FFM) of Personality focuses on consistent cognitive, emotional, and behavioral patterns, *traits* (Gençöz & Öncül, 2012). To McCrae and Costa (2003), traits are degrees of variations across individuals.

FFM personality dimensions include Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (Goldberg, 1990, 1993). Extraversion pertains to positive affectivity and social interactions. Extraverts are sociable, fun, affectionate, friendly, and talkative. They enjoy others' company. Agreeableness is also characterized as high quality in social interactions and support. Trust, altruism, empathy, kindness, and affection is related to agreeableness. Agreeable individuals are cooperative and caring. Conscientiousness, on the other hand, signifies goal-directed behavior and use of strategies. It is associated with being hardworking, ambitious, energetic, and persevering. That is, such individuals are self-disciplined, well-organized, and habitually careful. On the contrary, neuroticism pertains to negative affect and disturbed thoughts or behaviors such as worrying, feeling insecure, self-conscious, anxiety, depression, anger, embarrassment, hostile reactions, wishful thinking, mistrust, smoking, overeating, or drinking excessively. Contrarily, Openness to Experience can be associated with self-esteem and positive affect. Openness to Experience can be characterized by originality, imaginativeness, and creativity; therefore, such individuals might see themselves more intelligent with a broad range of interests (Gençöz & Öncül, 2012; Goldberg, 1990, 1993; Mccrae & Costa, 1987). Regarding the lexical hypothesis, which suggest that every culture has its own trait adjectives to communicate individual differences (Digman & Inouye, 1986), this study uses a Turkish personality inventory. In this inventory, Negative Valence emerges as a trait; therefore, it needs some explanation. Like Neuroticism, Negative Valence contributes to psychological well- being negatively. Gençöz and Öncül (2012) stated that while Neuroticism is related to distress and anxiety, Negative Valence pertains to self-worth.

Research on metacognition and personality

Research examining teachers' metacognition is not ample and specifically the relation of in-service teachers' metacognition and personality might not be out there, yet. For this reason, current research with students and/or pre- service teachers will be elaborated in the following to be able to answer research questions in this study.

Fayyaz and Kamal (2011) provided some evidence for the relation of personality traits and metacognitive listening skills in a foreign language. They found that Neuroticism negatively correlated with metacognitive listening skills while Openness to Experiences had a positive relation with metacognition. Agreeableness did not have a relation with metacognition. Conscientiousness was the highly significant predictor of metacognitive listening skills.

Similarly, Fazeli (2012) found that foreign language learners' metacognitive strategy use correlated with Extraversion, Openness to Experience, and Conscientiousness, positively and Neuroticism, negatively. Fazeli (2012) also reported that Conscientiousness and Openness to Experience can explain 17.7% of the metacognitive strategy use.

Ayhan and Turkyilmaz (2015) also examined the relation between metacognitive strategies and personality traits of foreign language learners. They found Extraversion, Openness to Experience, Agreeableness, and Conscientiousness significantly correlated with metacognitive language learning strategy use.

Öz (2016) recently reported that personality had a strong predictive power in determining metacognitive awareness; 29% of the variance in metacognitive knowledge and 28% of the variance in metacognitive regulation was explained by personality traits. Openness to Experience and Extraversion were the strongest predictors.

Kelly and Donaldson (2016) also studied the relation among metacognition, personality, and academic performance. They reported a significant relation Conscientiousness and metacognition. Kelly and Donaldson (2016) also argued that metacognition may depend on personality; when individuals are Conscientious, they can practice metacognition.

Wahdah, Ainin, & Hamid (2018) also examined learners' personality traits and metacognition. These researchers found significant correlations between Openness to Experiences and metacognition.

Methodology

Participants

This study was conducted with the help of 33 foreign language instructors in the western Turkey. At the time of research, participants worked at a state university, School of Foreign Languages. Of 33, 27 (82%) were females and 6 (18%) were males. Their ages ranged between 23 and 52. 64% of them studied English or American Language and Literature, 33% studied Foreign Language Teaching, and the rest studied Translation Studies for their undergraduate degree. These instructors held an undergraduate degree (N=17), master's (N=14), or a PhD (N=2). Teaching experiences of these participants changed between 1 and 29 years. None of these participants took any kind of formal training on metacognition or metacognition instruction.

Data collection tools

Data were collected via a quantitative methodology, survey research. In this study, I implemented two inventories; Turkish personality inventory (BPTI) and Metacognitive Awareness Inventory (MAI).

Turkish personality inventory

BPTI was developed by Gençöz and Öncül (2012) regarding the lexical hypothesis with a group of Turkish. The scale consists of 45 items and these items can be rated on a 5-point Likert scale, ranging from *(1) this characteristic does not represent me at all* to *(5) this characteristic represents me very well.* The inventory factors on 6 traits; extraversion, conscientiousness, agreeableness, neuroticism, openness to experience, and negative valence. Internal reliability coefficients for six factors were between .71 and .89 and the inventory can explain 53% of the variance in personality trains.

Metacognitive awareness inventory

MAI was developed by Schraw and Dennison (1994). MAI is a 52-item instrument factored on metacognitive knowledge (17 items) and regulation of cognition (35 items). The internal consistency of

the scale for metacognitive knowledge was α=.93 and metacognitive regulation was α=.96. The internal consistency for three components of metacognitive knowledge ranged from α= .90 to α=.85 and for metacognitive regulation from α= to α= .83. Two factors accounted for 58% of the variance. In this study, a five-point scale, ranging from *(1) never* to *(5) always*, was used to assess language instructors' metacognition.

Data analysis procedures

Data were analyzed via a set of parametric tests following validation of essential assumptions. To answer the first research question, weather teachers' metacognition changes by gender, age, undergraduate major, level of education, and teaching experience, a set of ANOVA and t- tests were run. Moreover, to examine the relation between metacognition and personality traits, Pearson product-moment correlations were run. Finally, regression analyses were run to determine the predictive power of personality traits on different components of metacognition.

Results

Metacognition via teacher-characteristics

In this study, participants' self-reports on MAI confirmed that they were (highly) metacognitive individuals. Their metacognitive knowledge (MK) scores ranged between a minimum of 3 and a maximum of 4.82 (M=4, SD=.47) and metacognitive regulation (MR) scores ranged between a minimum of 2.74 and a maximum of 4.80 (M=3.77, SD=.55).

A set of ANOVA and t- tests confirmed that teachers' metacognition did not change by their gender or across different groups of age, undergraduate major, educational level, and teaching experience (p>.05).

Relation of metacognition and personality traits

In this study, participants' dominant personality trait was Agreeableness with a minimum of 3.25 and a maximum of 5 (M=4.37, SD=.41). Following this trait, Conscientiousness (M=3.92, SD=.65), Extraversion (M=3.8, SD=.73), and Openness to Experience (M=3.71, SD=.5) emerged as secondary dominant traits. Neuroticism (M=2.6, SD=.63) and Negative Valence (M=1.3, SD=.32) were subordinate. Moreover, correlation tests confirmed that MK and MR were correlated, positively (p<.05). The correlation was strong, r=.723.

Correlation tests also confirmed that a) MK and Openness to Experience (r= .63) and b) MR and Agreeableness (r=.420) as well as Openness to Experience (r=.504) were correlated, positively (p<.05). The correlations of Openness to Experience and MK or MR were strong while the correlation of Agreeableness and MR was moderate.

Predictive power of personality traits and metacognitive components

Previous tests showed that MK and MR were strongly correlated as well as both of these components correlated with a personality trait; Openness to Experience. Therefore, multiple regression analysis was run to examine the predictive power of each variable.

The analyses to explain MK confirmed that Openness to Experience and MR can explain 40% and 60% of the variance in MK, respectively. When the model includes both Openness to Experience and MR, it can explain 68% of the variance in MK ($R2$ =.678, SE=.27, F(2,30)=31, p<.01). It was found that Openness to Experience significantly predicted MK (β =.28, p<.05), as did MR (β =.531, p<.05).

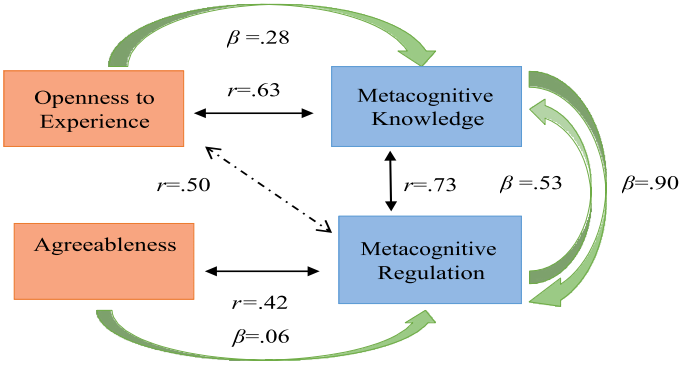

Figure 1. Teachers' metacognition and personality

On the other hand, the analyses to explain MR confirmed that MK and Agreeableness can explain 60% and 18% of the variance in MR, respectively. These two variables accounted for 76% of the variance in MR (R^2=.76, SE=.27, F(2,30)=49, p<.05). It was found that Agreeableness (β=.067, p<.05) and MK (β=.90, p<.05) significantly predicted MR. When the model included Openness to Experience as it had a significant correlation with MR, this personality trait became a statistically insignificant predictor of MR (β=-.066, p>.05).

Discussions and Conclusion

This study developed on the argument that individuals might show variations regarding metacognition competence (Veenman et al., 2006) and without formal trainings, such competence might relate to individual variables such as personality traits (Duff et al., 2004; Furnham et al., 1999; Kelly & Donaldson, 2016).

Findings indicated that participants in this study reported high levels of metacognitive knowledge and regulation. These components, moreover, did not show any significant difference across any levels of various demographics including gender, age, undergraduate major, educational level, and teaching experience. These findings aligned with a previous study done with pre-service teachers by Öz (2016).

Moreover, on the contrary to some previous research studies that treated metacognition as a single unit, this study bounds to its theory and disseminates metacognitive dimensions regarding personality. This study also confirmed that personality traits closely correlated with and predicted dimensions of metacognition. Metacognitive knowledge was correlated with and predicted by Openness to Experience as did almost all previous research. Regarding the nature of this trait by which individuals manifest characteristics such as imagination, creativity, daringness, and insight, having a broad range of interests, wondering about the world, learning new things, thinking out of the box, and enjoying new experiences, individuals can gain knowledge; therefore, their metacognitive knowledge can naturally increase. Furthermore, metacognitive knowledge was strongly correlated with and predicted by metacognitive regulation. When individuals test metacognitive knowledge via regulatory strategies, they can adapt and modify their repertoire of metacognition. In other words, Openness to Experience might be the nourishing source of metacognitive knowledge while regulatory strategies might function as the organizing mechanism which constantly controls and manages such knowledge.

Metacognitive regulation was similarly correlated with and predicted by personality traits. It had correlations with Openness to Experience and Agreeableness. However, this domain seems mostly in action with Agreeableness and metacognitive knowledge, as seen on Figure 1. It may be easily argued that without awareness of or knowledge about self, task, strategies, and goals, one cannot regulate cognitions.

That is, without sufficient metacognitive knowledge, individuals might not be expected to plan, monitor, regulate, and evaluate cognitions, effectively. Moreover, regarding the characteristics of Agreeableness, which concerns individuals' orientations to others and pertains to a great deal of interest and care about other people, helping and contributing to the happiness of other people, and cooperativeness, manifestations of metacognitive knowledge might become conscious and purposeful efforts. That is, without any formal trainings of metacognition when individuals pursue their personal goals in alignment with others' well-being, they can manage their cognitions for the most benevolent and altruistic outcomes.

The findings in this study, still, might be bound to participants' professional characteristics and it might not be possible to generalize regarding individual orientations towards metacognition. While research studies done with students highlighted Conscientiousness as a significant variable or predictor of metacognition (e.g. (Ayhan & Turkyilmaz, 2015; Fayyaz & Kamal, 2011; Fazeli, 2012; Kelly & Donaldson, 2016), Agreeableness emerged as a significant predictor in this study. This might stem from teachers' orientations to teach or help improve less proficient individuals and their potential motives to do their best for students' success and/or good. To fulfill such altruistic tasks, teachers may feel both the urge to update their knowledge and/or professional competence by reaching out various sources and to regulate their cognitions and teaching actions. In fact, this hypothesis can be supported by previous research (e.g. Author, 2018).

In previous studies, I found that highly metacognitive teachers implement regulatory control over their instructional practices (2018) and tend to teach metacognition to their students (2017). By these profession-specific findings, I recommend future studies to explore similar questions with different professionals to be able to produce comparable results.

Educational implications

By these findings and considering teachers' pre- and in-service professional development, some instructional practices might be promoted. First of all, presenting metacognition theory and practicing metacognition instruction is essential regarding teachers' instrumental role (Author, 2017). Without teachers' being metacognitive individuals and without their knowledge of how to deliver such instruction, all students in mainstream classrooms might not develop such competency (Öz, 2016). Moreover, there might be some instances where metacognition theory and instructional practices might not be delivered, purposefully and/or explicitly. In such cases, some practices where pre- and/or in-service teachers can mostly manifest characteristics of Openness to Experience and Agreeableness traits can be utilized. That is, both pre- and in-service teachers can be given opportunities to; explore themselves more, develop variety of interests, bring original ideas to learning environments, practice creativity and complex thinking, and be imaginative and daring, as well as practice patience or tolerance with various and/or diverse ideas, show trust and sympathy to different people, cooperate with others for an ultimate goal, help others with various degrees of intellect or ability, and support others to reach personal goals or standards.

By instructional practices that incorporate either metacognition or targeting some personality traits which might facilitate metacognition, it may be possible to help promote or improve teachers' metacognition. Although teacher educators might argue that such qualities could or should have developed so far, it is important to consider that we ultimately, albeit indirectly, aim to help young children who are still exploring the world and constructing an understanding of learning.

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