

The Relationship of Personality Traits with Metacognition: The Regulating Role of Mindfulness

Kişilik Özelliklerinin Üstbilgi ile İlişkisi: Bilinçli Farkındalığın Düzenleyici Rolü

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Abstract

The aim of this research is to determine the relationship between personality traits and metacognition and the regulatory role of mindfulness in this relationship. The research is a relationship-scanning model, and Hayes' process plugin was used for regulatory role analysis. The research sample consisted of 413 individuals between the ages of 18-51. The Metacognition Scale-30, Mindfulness Scale, and Five-Factor Personality Scale Short Form were used for data collection. According to the findings of the study, there is a negative relationship between extraversion, agreeableness, conscientiousness, openness to experience, mindfulness, and pathological metacognition and a positive relationship with neuroticism. Mindfulness was not found to play a significant regulatory role in the relationship between personality traits and metacognition.

Keywords: Personality traits, metacognition, mindfulness, regulating role

Öz

Bu araştırmanın amacı, kişilik özellikleri ile üstbilgi arasındaki ilişkiyi ve bu ilişkide bilinçli farkındalığın düzenleyici rolünü belirlemektir. Araştırma bir ilişki tarama modelidir ve düzenleyici rol analizi için Hayes'in süreç eklentisi kullanılmıştır. Araştırmanın örneklemini 18-51 yaş aralığında 413 birey oluşturmaktadır. Veri toplamak için Üstbilgi Ölçeği-30, Bilinçli Farkındalık Ölçeği ve Beş Faktör Kişilik Ölçeği Kısa Formu kullanılmıştır. Çalışmanın bulgularına göre, dışadönüklük, uyumluluk, vicdanlılık, deneyime açıklık, bilinçli farkındalık ve patolojik üstbilgi arasında negatif, nevrotiklik ile pozitif bir ilişki vardır. Bilinçli farkındalığın kişilik özellikleri ve üstbilgi arasındaki ilişkide önemli bir düzenleyici rol oynamadığı görülmüştür.

Anahtar Kelimeler: Kişilik özellikleri, üstbilgi, bilinçli farkındalık, düzenleyici rol



Introduction

Personality is a set of continuous behavioral traits that distinguishes a person from others. (Aslan, 2008). It has been established that character quality is linked to metacognition. (Ozturk, 2020), however, the number of studies revealing this relationship is very limited. This study focused on how mindfulness affects the relationship between personality traits and metacognition.

Five factor personality traits

The five-factor personality model is a widely known theory in the field of individual differences in personality traits (Mather, 2019). Costa and McCrae (1995) developed a five-factor personality trait theory. They found that personality traits were clustered around five main themes. These factors include emotional instability, conscientiousness, extraversion, agreeableness, and openness to experience (McCrae & John, 1992). Five factors are considered important classification to study individual differences (Ötken & Cenkci, 2019). This theory argues that individual differences and personality traits are reflected in discourses in different cultures and in different words in the languages of these cultures

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(Somer, 1998). The extraverted dimension measures how socially a person is and how comfortable they are in social environments (Yurdakul, 2019). In general, extroverted individuals are sympathetic, talkative, leading, self-righteous, assertive, fun, positive, and appear to be related to others people (McShane & Von Glinow, 2005; Ötken & Cenkci, 2013). Openness to experience involves seeking different experiences, creativity, and thinking differently (Shi, Lin & Wang, 2009). These people are very curious. They were open-minded and had high analytical thinking skills. They are imaginative people who like to research constantly (Kaşlı, 2009). Emotional instability is also known as neuroticism. It describes individuals who tend to look at their environment from a negative perspective and tend to live with various emotions, such as guilt, anxiety, anxiety, sadness, irritability, and fear (Costa & McCrae, 1995; Ercan, 2010). Agreeableness is a factor that includes characteristics such as empathy, respect, kind, compassion, humility, and peace (Somer, Korkmaz & Tatar, 2002). They are people who try not to enter interpersonal conflicts and are pro-compromises (Demirkan, 2006). Conscientiousness, another personality trait, is related to self-control and discipline (Yurdakul, 2019). It includes organized, planned, goal-oriented, controlled, success-oriented, efficient, and disciplined people who value ethical rules (Costa & McCrae, 1985; Kalat, 1996).

Metacognition

Metacognition refers to having knowledge about one's own cognitive processes and purposefully directing and controlling cognitive processes in line with this knowledge (Flavelle, 1979). Another definition is cognition, which can regulate and control awareness (Wells, 2009). It is the awareness of what an individual thinks and knows (Tosun & Irak, 2008). Metacognition was examined under two subheadings: cognitive regulation and cognitive knowledge. However, very different ideas have been put forward regarding the functions of metacognition and its dimensions. For example, one of them is the idea proposed by Efklides. He mentioned dimensions such as metacognitive knowledge, skills, and experience (Efklides, 2008). In another conceptualization, two different metacognitive thinking styles are defined: positive and negative metacognitive beliefs. Examples of positive metacognitive beliefs are affirmation of the experienced anxiety, and negative metacognitive beliefs about the uncontrollable and dangerous thoughts can be given as examples. In addition, two different metacognitive knowledge dimensions were also defined. One is cognitive self-awareness, which is defined as being aware of one's thoughts, and the other is cognitive self-confidence, which is defined as the dimension of trust in one's own cognitive processes (Cartwright-Hatton & Wells, 1997; Marrison & Wells, 2003). When we look at the studies on metacognition, it is seen that there are studies that reveal its relationship with psychopathologies (Baltacı, 2018, Karakaş, 2020). Studies revealing its relationship with obsessive-compulsive disorder are common (İlter, 2019; Oyman, 2012; Panayırıcı, 2012). Other studies have evaluated metacognition in substance use disorders (Çelik, 2020) and the effect of distraction techniques on metacognition in alcohol use disorders were studied (Yıldırım, 2020).

Mindfulness

Mindfulness is based on Eastern meditation culture and is a technique that directs attention (Baer, 2013; Özyeşil, 2000). It is an accepting focus of one's current attention on one's inner world and environment (Brown & Ryan, 2003). The more perceptually and sensorially aware of the stimuli, the more aware they are of their feelings, thoughts, and desires (Özlenen et al., 2011). This process had two main dimensions. The first is the dimension of being aware of what is happening here and now and accepting that realized. Studies have shown that mindfulness is positively related to personality factors such as extraversion, openness, and agreeableness (Baer, Smith & Allen, 2004; Giluk, 2009) and negatively related to emotional instability (Giluk, 2009; Walsh, et al., 2009). Some studies have found that mindfulness plays a regulatory role. For example, Nalbantoğlu (2020) considered high mindfulness levels within the scope of social anxiety disorders. Participants with high mindfulness revealed that, even though they had cognitive exaggerations, they did not engage in social avoidance behavior. A previous study found that mindfulness is inversely related to rumination and stress (Önder & Utkan, 2018). Rumination is also associated with cognitive trust, positive beliefs, and metacognitions of uncontrollability and danger (Yılmaz, 2015). In light of the results of this research, it was thought that mindfulness would have an inverse relationship with metacognition, and this relationship could be changed by taking a step forward and interacting with personality traits of mindfulness. In line with these explanations, it was thought that mindfulness might have a regulatory effect on the relationship between personality traits and metacognition.

Problem status

Mindfulness practices cultivate an increased sense of self-awareness, allowing individuals to observe their thoughts,

emotions, and behaviors without judgment (Tan & Martin, 2016). This heightened self-awareness can facilitate the recognition and understanding of one's own personality traits, leading to more accurate self-assessment, which, in turn, influences metacognitive processes. Mindfulness has been associated with reduced cognitive biases, such as confirmation bias and self-serving bias (Maymin & Langer, 2021). By cultivating a non-judgmental and open mindset, mindfulness helps individuals to approach situations with a more balanced and unbiased perspective. This reduction in cognitive biases can potentially improve metacognitive processes by enabling individuals to assess their own thoughts and judgments more objectively. Mindfulness practices promote emotional regulation by encouraging individuals to acknowledge and accept their emotions without judgment. This emotional regulation can help individuals to navigate and manage their emotional responses, facilitating more adaptive metacognitive processes (Grecucci et al., 2015). By regulating emotions, mindfulness may enable individuals to approach their personality traits and metacognitive processes with a calmer and more balanced mindset. Personality traits and metacognition can both involve automatic or habitual patterns of thinking and behaving. Mindfulness practices promote a shift from automaticity to conscious awareness and intentional action (Shea et al., 2014). By encouraging individuals to be more present and mindful in the moment, mindfulness can help break automatic thought patterns associated with personality traits and facilitate metacognitive processes that involve intentional reflection, evaluation, and self-regulation. In summary, mindfulness may have a regulating role in the relationship between personality traits and metacognition by enhancing self-awareness, reducing cognitive biases, facilitating emotional regulation, and decreasing automaticity. By cultivating these mindful qualities, individuals are likely to engage in more accurate, reflective, and adaptive metacognitive processes, leading to a deeper understanding of their personality traits and facilitating personal growth and self-improvement. Additionally, it is expected that the examination of metacognition with personality traits rather than a pathological sample has not been done sufficiently, and that the regulatory role of mindfulness in the relationship between personality traits and metacognition will be revealed; in this context, it is expected that it will provide a lot of convenience in creating a metacognitive profile according to the personality traits of the client, especially in the evaluation phase. In this respect, since mindfulness is frequently used by clinical psychologists in counselling/therapy processes, this study is thought to contribute to the field of practice, as it will provide an idea about the metacognition of clinical psychologists working in the field according to the personality traits of their clients and help them plan their interventions.

This study can provide insights to mental health professionals in the field of practice and shed light on future research on these issues. Thus, it is expected to contribute to the creation of different research questions and identification of different problems. In summary, this study aimed to expand the findings of previous studies investigating personality traits, metacognition, and mindfulness variables, to provide researchers with insights into the aspects of metacognition and mindfulness related to personality traits, and to provide a background for clinicians to develop mindfulness- and metacognition-based interventions. The research questions in this context are as follows.

1. Is there a significant relationship between personality traits and metacognition scores?
2. Is there a significant relationship between personality traits and mindfulness scores?
3. Is there a significant relationship between mindfulness and metacognition scores?
4. Does mindfulness have a regulating role in the relationship between personality traits and metacognition?

Method

Research model

The research model is a relational screening model since the relationship between metacognition and personality traits will be examined. The regulatory role of mindfulness in the relationship between personality traits and metacognition was also examined.

Sample

To determine the sample size, the sample size calculation table developed by Yazıcıoğlu and Erdoğan (2004) was utilized. Accordingly, at least 357 participants with a sampling error of .05 ($p=.05$, and $q=.5$) were considered

sufficient for the sample. In accordance with the population, a total of 413 participants were included in this study. The study group consisted of 413 people who voluntarily answered the measurement tools that were shared online. 79.2% Of the participants, 79.2% were in the 18-35 age range and 20.8% were in the 35-51 age range. Of the participants, 80.1% were women and 19.9% were men. 3.6% Of the participants, 3.6% were primary school students, 44.6% were high school students, 46% were university students, and 5.8% were graduate students.

Data collection tools

Demographic Form: Informed consent was obtained, and questions were asked about the age, sex, and educational status of the participants.

Metacognition Scale: This scale was adapted to Turkish by Tosun and Irak (2008). It is a 4-point Likert-type scale consisting of 30 questions (1 = strongly disagree, 4 = strongly agree). It consists of five sub-dimensions: positive beliefs, uncontrollability and danger, cognitive confidence, need to control thoughts, and cognitive awareness. The internal consistency of the entire scale was .93 with Cronbach's alpha. The lowest score that could be obtained from the scale was 30, while the highest score was 120. As the scores increased, the pathological metacognitive activities also increased. In this study, Cronbach's alpha was .87.

Mindfulness Scale: This scale was adapted into Turkish by Özyeşil et al. (2011). It is a 6-point Likert-type scale consisting of 15 questions (1 = almost always, 6 = almost never). While the Cronbach's alpha value of the scale was .80, the test-retest correlation coefficient was .86. Mindfulness also increased as the scores obtained from the scale increased. In this study, the Cronbach's alpha was .81.

Five-Factor Personality Scale Short Form: After being developed by Costa and McCrae, Benet-Martinez and John developed the short form in 1998. The Turkish adaptation of the short form was developed by Sümer et al. (2005). It is a 5-point Likert-type scale consisting of 44 items (1 = strongly disagree, 5 = completely agree). There were 44 questions in total and had five sub-dimensions. Its subdimensions are extraversion, agreeableness, emotional instability, openness, and responsibility. The internal reliability coefficient for the entire scale is .76. In this study, the Cronbach's alpha values ranged from .715 to .861.

Procedure

Ethics committee approval for the research was obtained from the Istanbul Beykent University Publication Ethics Committee for Social and Human Sciences (Permission number: 28.05.2021/41). After ethical approval, questionnaires were created using Google Forms, and the participants were asked to fill in the data collection tools. The participants were informed about the process and written informed consent was obtained from all participants for inclusion in the study. The study was conducted through social media channels. To increase the representativeness of the sample, convenience and snowball sampling were used to select the participants. Data collection tools were voluntarily completed by 413 participants.

Data analysis

The SPSS 22 package program was used for data analysis. There were no data exclusion criteria used. Regulatory variable analysis was performed using Pearson correlation and Hayes' process add-on package. As a result of all analyzes, a regression curve was drawn to show the interaction between personality traits and mindfulness. One standard deviation below the mean ($\bar{x}=60$) ($-1SD=47.56$) and one standard deviation above the mean ($+1SD=72.43$) were used to modulate high and low mindfulness levels. The regression equation for metacognition was calculated over the personality traits of these levels, and simple regression curves were drawn. In all analyses, $p<.05$ value was considered statistically significant.

Results

The results of the analysis performed to determine the relationship between personality traits, metacognition, and mindfulness and the mean and standard deviations of the scales are presented in Table 1.

Table 1
Interscale Correlation Analysis

		\bar{x}	Sd	1	2	3	4	5	6
1- Extraversion	r	28,93	7,02	1					
2-Agreeableness	r	36,10	5,56	.379**	1				
3-Conscientiousness	r	33,82	6,68	.434**	.440**	1			
4-Neuroticism	r	24,84	7,23	-.474**	-.547**	-.418**	1		
5-Openness	r	40,20	6,78	.269**	.181**	.272**	-.229**	1	
6-Metacognition	r	12,56	4,28	-.228**	-.359**	-.264**	.510**	-.138**	1
7-Mindfulness	r	59,99	12,43	.175**	.236**	.318**	-.365**	.102*	-.409**

As a result of the correlation analysis, the negative level between extroverted personality traits and metacognition ($r=-.228$) was low, between agreeable personality traits ($r=-.359$), moderately negative, and conscientious personality traits ($r=-.264$). There was a low-level negative correlation between metacognition, a moderate positive correlation between neurotic personality traits ($r=.510$), and low-level negative correlations between open-to-experience personality traits ($r=-.138$) and metacognition. The correlation between mindfulness and extraversion personality traits was low ($r=.175$), the correlation between mindfulness and agreeableness personality traits was low ($r=.236$), the correlation between mindfulness and conscientiousness personality traits was moderate ($r=.318$), the correlation between mindfulness and neurotic personality traits was low and negative ($r=-.365$), and the correlation between mindfulness and openness to experience was low ($r=.102$).

A low level of positive correlation was found between mindfulness and extraversion ($r=.175$), a low level of positive correlation was found with agreeableness ($r=.236$), a moderately positive correlation was found with conscientiousness ($r=.318$), a negative correlation was found with neurotic personality traits ($r=-.365$), and a low level of positive correlation was found with openness to experience ($r=.102$). It was determined that there was moderately negative ($r=-.409$) and a significant relationship between metacognition and mindfulness.

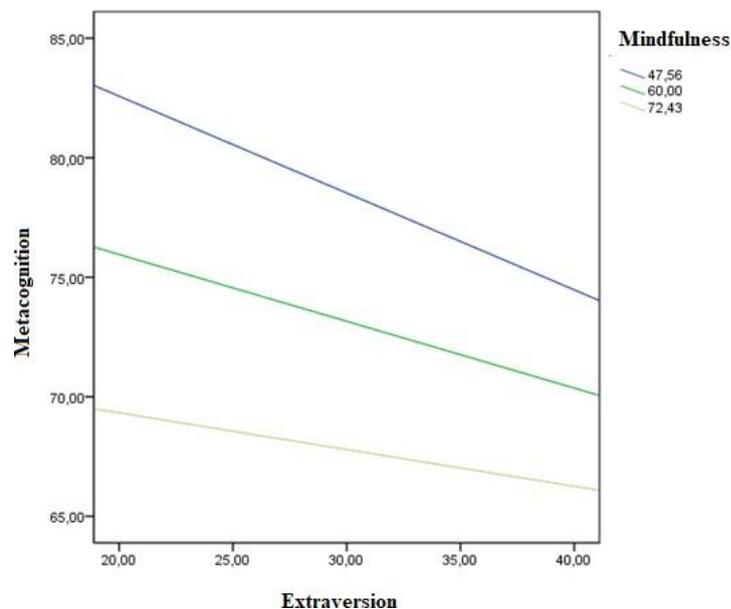


Figure 1

The Regulatory Effect of Mindfulness on the Metacognition Relationship of the Extraverted Personality Trait

Figure 1 shows the graph of the model formed as a result of the regression analysis performed for the

regulatory role of mindfulness in the relationship between extroverted personality traits and metacognition. The regression model established as a result of the analyses was found to be significant ($F(3,409)= 33.28$, $R^2=.0042$, $p=.00$); however, as a result of the regulator role analysis, it was determined that the extraversion personality trait did not have a regulatory role in mindfulness in its relationship with metacognition ($B=.0101$, $t=1.45$, $p=.14$, confidence interval: $-.0035/.0238$).

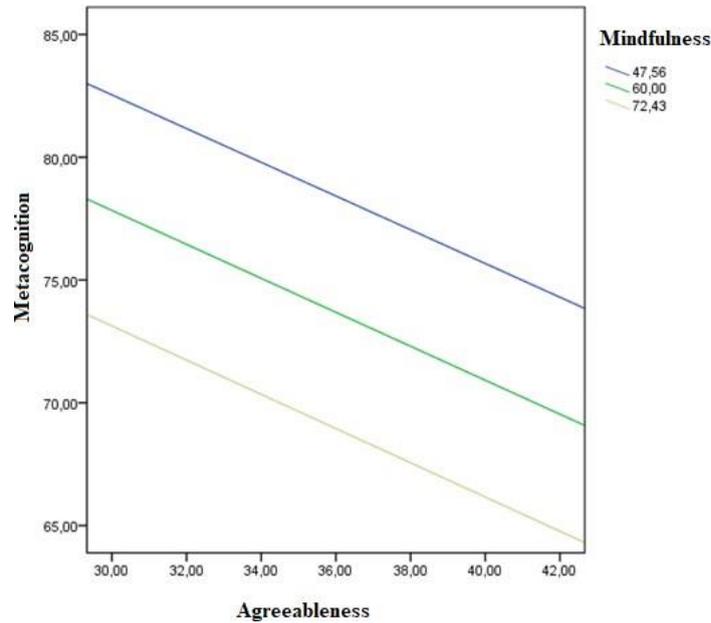


Figure 2

The Regulatory Effect of Mindfulness on the Metacognition Relationship of Agreeableness Personality Trait

Figure 2 shows the graph of the model formed as a result of the regression analysis performed for the regulatory role of mindfulness in the relationship between agreeable personality traits and metacognition. The regression model established as a result of the analyses was found to be significant ($F(3,409)= 43.02$, $R^2=.23$, $p=.00$), but it was determined that the adaptability personality trait did not have a regulatory role in mindfulness in its relationship with metacognition ($B=-.0004$, $t=-.04$, $p=.96$, confidence interval: $-.0168/.0160$).

In Figure 3, the graph of the model formed as a result of the regression analysis performed for the regulatory role of mindfulness in the relationship between conscientiousness and metacognition. The regression model established as a result of the analyses was found to be significant ($F(3,409)=31.59$, $R^2=.18$, $p=.00$), but it was determined that mindfulness did not have a regulatory role in the relationship between conscientiousness personality traits and metacognition ($B=.005$, $t=.00$, $p=.42$; confidence interval: $-.0082/.0192$).

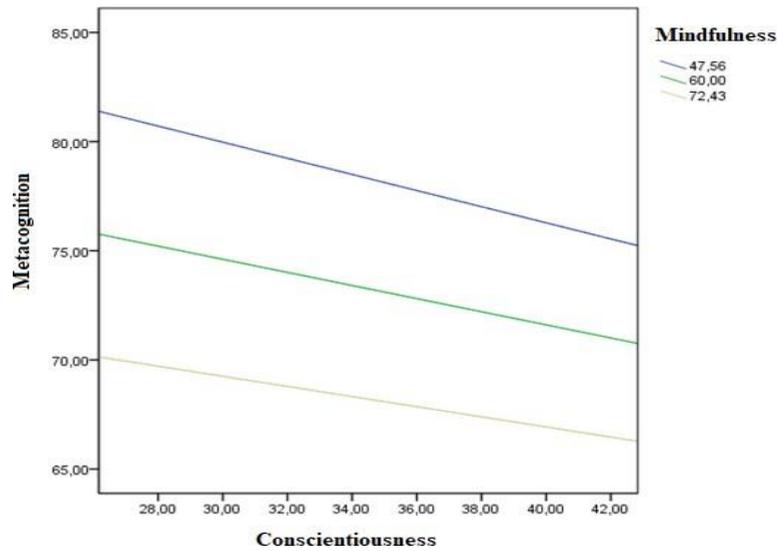


Figure 3

The Regulatory Effect of Mindfulness on the Metacognition Relationship of Conscientiousness Personality Trait

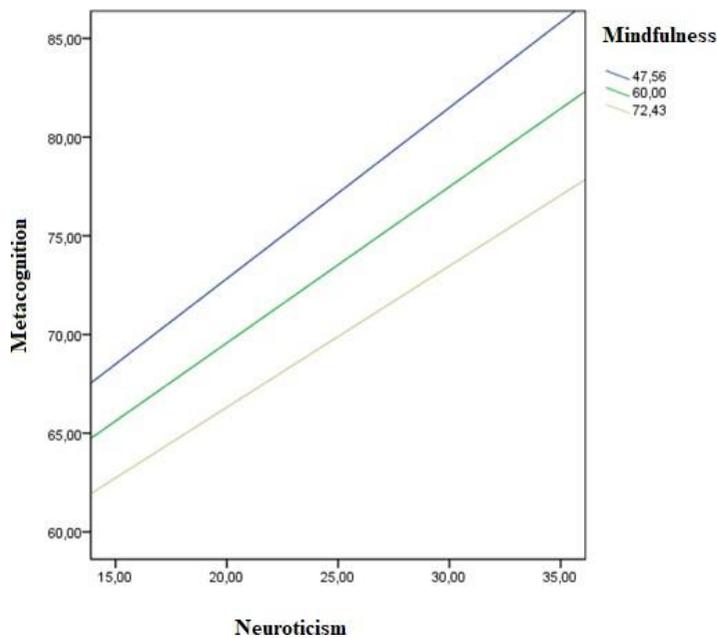


Figure 4

The Regulatory Effect of Mindfulness on the Metacognition Relationship of Neuroticism Personality Trait

In Figure 4, the graph of the model formed as a result of the regression analysis performed for the regulatory role of mindfulness in the relationship between emotional instability and personality traits and metacognition. The regression model established as a result of the analyses was significant ($F(3,409)=64.08$, $R^2=.31$, $p=.00$). However, it was determined that the emotional instability personality trait did not play a regulatory role in mindfulness in its

relationship with metacognition ($B = -.0060$, $t = -1.13$, $p = .25$, Confidence interval: $-.0165/.0044$).

In Figure 5, the graph of the model formed as a result of the regression analysis performed for the regulatory role of mindfulness in the relationship between the personality trait of being open to experience and metacognition is shown. The regression model established as a result of the analyses was found to be significant ($F(3,409) = 30.08$, $R^2 = .18$, $p = .00$), but it was determined that the personality trait of openness to experience did not have a regulatory role in mindfulness in its relationship with metacognition ($B = .0109$, $t = 1.49$, $p = .13$, confidence interval: $-.0034/.0252$).

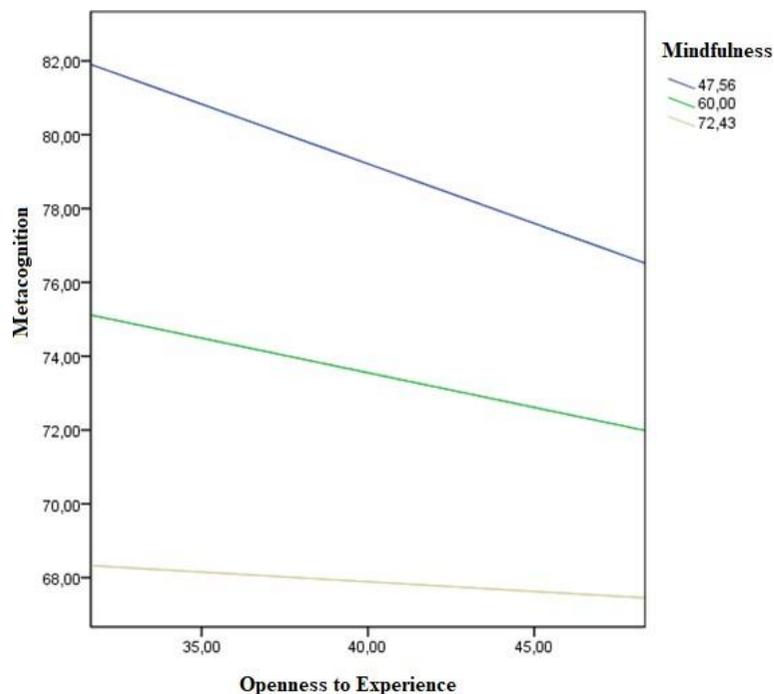


Figure 5

The Regulatory Effect of Mindfulness on the Metacognition Relationship of Openness to Experience Personality Trait

Discussion

This research found a negative relationship between extraversion and metacognition. A negative relationship has been found between extraversion and metacognition (Gacal, 2018; Uzun, 2019). In one study, a negative relationship was found between extraversion and psychological symptoms related to anxiety, depression, and the negative self (Gökdağ & Naldöken, 2020). There are findings in the literature showing a negative relationship between depression and trait anxiety and metacognition (Özsoy & Kuloğlu, 2017).

The findings reveal a negative relationship between agreeableness and metacognition. Other studies do not detect a relationship between agreeableness and metacognition (Uzun, 2019). Individuals with alexithymia have difficulty with empathy. Compatibility includes empathy, respect, kind, compassion, humility, and peace (Somer et al., 2002). One study found a positive relationship between alexithymia and metacognition (Uzal et al., 2018). In another study, a negative correlation was found between psychoticism and metacognition. According to Eysenck, psychoticism is a characteristic of a cold personality that is far from empathy. A negative correlation was found between psychological symptoms and agreeableness, depression, negative self, somatization and hostility (Gökdağ & Naldöken, 2020).

This analysis revealed a negative relationship between conscientious personality traits and metacognition. Conscientiousness is related to self-control and discipline (Yurdakul, 2019). It includes organized, planned, goal-oriented, controlled, success-oriented, efficient, and disciplined people who value ethical rules (Costa & McCrae, 1985; Kalat, 1996). A negative relationship has been found between the psychological symptoms of responsibility, anxiety, depression, negative self, and

somatization (Gökdağ & Naldöken, 2020). As a result of this research, conscientiousness showed a positive relationship with positive metacognitive beliefs. (Long, 2019). An increase in metacognitive scores in this study indicated an increase in pathological metacognitive activity. In line with this explanation, this research supports the results of Uzun's research.

Openness to experience personality traits is related to seeking different experiences, creativity, and thinking differently (Shi et al., 2009). These people are very curious. They were open-minded and had high analytical thinking skills. They are people who like to research continuously and have strong imaginations (Kaşlı, 2009). As a result of the research, a negative relationship was found between openness to experience and metacognition. A previous study found a negative relationship between openness to experience and negative metacognitive beliefs (Uzun, 2019). A negative correlation was found between openness to experience and intolerance of uncertainty variable (Berenbaum, Bredemeier, & Thompson, 2008).

In this study, a positive relationship was found between the personality trait of emotional instability and metacognition. Emotional instability refers to individuals who tend to look at their environment from a negative perspective and tend to live with various emotions, such as guilt, worry, anxiety, sadness, nervousness, and fear (Erçan, 2010). In the literature, positive correlations were found between emotional instability and negative metacognitive beliefs (McEvoy & Mahoney, 2012; Sugiura, 2017; Van der Heiden, Melchior, Muris, Bouwmeester, Bos, & Van der Molen, 2010). In one study, emotional instability was positively related to anxiety, depression, negative self, and hostility (Bilen, 2017). Another study determined that emotionally unstable personality traits were positively related to anxiety, depression, negative self, somatization, and hostility. In other words, emotional instability, which is emotionally unstable, has a positive relationship with psychopathologies.

Considering the definitions and findings in the literature, it was found that personality traits that seemed positive showed a negative relationship with psychopathological symptoms. Similarly, negative-looking metacognitive functions positively correlated with psychopathology. In light of this information, personality traits that seem positive are expected to show a negative relationship with negative metacognitions.

This research found a negative relationship between mindfulness and metacognition. A study found a negative relationship between mindfulness and metacognition in children aged 15-18 (Altan, 2019). Similarly, another study found a negative relationship between metacognition and mindfulness (Önen, 2021). Those with high mindfulness are aware of their feelings, thoughts, and wishes at the same rate as they are perceptually and sensorially aware of stimuli (Özbeyaz et al., 2011). Metacognition, on the other hand, is cognition applied to cognition that regulates and controls awareness (Wells, 2009). Looking at the definitions, it is expected that if you have high mindfulness, someone's metacognitive abilities will also be high. In this study, it was expected that as metacognitive scores increased, pathological metacognitive activities increased, so that it had a negative relationship with mindfulness.

This study found a positive relationship between extraversion, agreeableness, conscientiousness, and openness to experience personality traits and mindfulness, and a negative relationship between emotional instability and mindfulness. A study conducted with high school students found that while extraversion, agreeableness, conscientiousness, openness to experience, and mindfulness were positively related, they were negatively related to emotional instability (Yiğit, 2021). In another study, a negative relationship was found between mindfulness and emotional instability, and a positive relationship with the personality trait (Giluk, 2009). In another study, the relationship between the personality traits of university students and mindfulness was investigated, and the results were found to be the same as those of this study (Nam & Akbay, 2020). Batum (2020) investigated the relationship between interpersonal mindfulness and personality traits in marriages. The results showed that extraversion, agreeableness, responsibility, and openness to experience were positively and negatively correlated with emotional instability. The results of this study show that this is in parallel with the literature in question.

Another important finding of this study is that mindfulness does not play a regulatory role in the relationship between personality traits and metacognition. Although previous studies on the regulatory role of mindfulness and its regulatory role in the relationship between personality traits and metacognition have not been conducted. In a previous study, university students participated in a seven-week mindfulness-based skills program. Metacognitive beliefs were measured before and after the program. Although not statistically significant, a decrease in metacognition scores was observed (Keçeli, 2017). In this study, mindfulness slightly affected the relationship between metacognition and personality traits, although it was not significant. The reason for this result may be that the sample covered a general segment. In this study, we asked whether the

participants who constituted the sample on the demographic form had psychological diagnoses. A total of 24.5% of the participants stated that they had received a psychological diagnosis. Similarly, he was asked whether he had previously received psychotherapy/psychological counseling. A total of 39.5% stated that they had received psychotherapy/psychological counseling services. Mindfulness is one of the methods of focusing on the here and now, taking control based on attention, accepting, and accepting what is happening in the environment without judging them. Mindfulness is the experience of attention and awareness in the present moment (Deniz, Erus, & Büyükbeci, 2017).

When the literature is examined, it has been revealed that mindfulness-based skills have a regulating effect on symptoms in patients with depression (Demir, 2015; Ma & Teasdale, 2004). Many studies have shown that mindfulness also regulates anxiety (Kaviani, Javaheri, & Hatami, 2011). In the regulatory role analysis, the -1 standard deviation, +1 standard deviation, and mindfulness scores were divided into three groups: low, medium, and high. In this study, it can be said that the sample has 16.7% low mindfulness, 67.8% moderate mindfulness, and 15.5% high mindfulness. Within the framework of these explanations, the structure of the sample can be summarized as follows: it is a sample in which those with pathological diagnosis are less than those without, those with moderate mindfulness are more, and the participants with low mindfulness are more than those with high mindfulness. This may have been due to the structure of the sample. A non-significant regulatory role may be significant with a larger sample size or a different sample.

Limitations and recommendations

This study had some limitations. This study was limited to 413 people living in Turkey. In this respect, the results of this study emerged within its framework. This study can be repeated in different sample groups and with different sample numbers. Because the collection of data in an online environment limits the number of samples, it is thought that the collection of face-to-face data as a method of data collection may have increased the number of samples. The findings were obtained using the correlational method, so it has a structure that limits causality. Therefore, it is recommended to study the investigated structures through a hybrid quantitative and qualitative methodology. In this study, the regulatory role of mindfulness was investigated, and no significant findings were obtained. Mindfulness is a method that has techniques based on attention and has been widely used in mindfulness-based psychotherapies recently. Clinicians may need to reconsider the use of Mindfulness-Based (MBIs) Interventions as a one-size-fits-all tool for improving metacognitive abilities across different personality types. If mindfulness does not regulate the relationship between personality and metacognition, then MBIs might be more effective when tailored to specific personality profiles. Since mindfulness may not be a regulating factor, clinicians should explore other strategies that could enhance metacognition. This could include cognitive-behavioral techniques, metacognitive training, or other therapeutic approaches that directly target metacognitive skills. Clinicians might need to integrate a variety of therapeutic approaches to cater to the needs of individuals with different personality traits. For example, those with certain traits that are associated with poorer metacognition might benefit from more structured or directive therapies. A more holistic approach that considers an individual's personality, metacognitive abilities, and other psychological factors (such as stress, coping styles, and resilience) may be more effective than approaches that focus on mindfulness alone.

Investigation of the regulatory role of resilience, which can vary depending on many factors and is the subject of positive psychology, can be recommended because of its contribution to the literature. The moderating role of psychological flexibility, one of the concepts of acceptance-commitment therapy, has recently become popular in the relationship between personality traits and metacognition. Many scales in the literature measure personality traits. This research can be replicated by using different personality trait scales.

Participant Consent: All participants in the study gave their consent to the study.

Author Contributions: Concept- S. K.; Design- S. K.; Supervision- S. K., N. K. G.; Resources- S. K.; Data Collection and/or Processing- S. K., N. K. G.; Analysis and/or Interpretation- S. K.; Literature Search- S. K., N. K. G.; Writing Manuscript- S. K.; Critical Review- S. K., N. K. G.

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