

Relationship between Sensory Processing Sensitivity and Personality Traits

Duyusal İşleme Hassasiyeti ve Kişilik Özellikleri Arasındaki İlişki

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ABSTRACT

Reactions to stimuli vary from person to person. The same stimulus has different effects depending on the perception of different people and the physical and mental states they are in. Considering this difference, situations can be seen in which a person perceives a specific stimulus or group of stimuli as negative and disturbing for themselves. In particular, people with high levels of sensory processing sensitivity feel the negative effects of stimuli more intensely both in terms of their internal processes (hunger, pain, sadness, stress, etc.) and the situation of the physical environment (loud noise, bright light, pungent odor, etc.) which they are in. On the other hand, the existence of situations where sensory processing sensitivity has a positive effect is also noticeable. In this context, the relationship between sensory processing sensitivity and personality traits is examined. The concept of personality is explained in different ways by many different theorists in the international literature. In order to avoid confusion that may arise in the definition and understanding of personality traits, in this review study, personality traits are examined on the basis of the Five Factor Personality Theory. Within the framework of the personality definition of the Five Factor Personality Theory, The relationship between five basic personality traits and sensory processing sensitivity is examined by also considering the subdimensions of each five personality traits.

Keywords: Sensory processing sensitivity, Five Factor Theory of Personality, reactivity, personality traits

ÖZ

Uyarılara verilen tepkiler kişiden kişiye değişiklik göstermektedir. Aynı uyaran farklı kişilerin algılayışı ve içinde buldukları fiziksel ve zihinsel durumlara bağlı olarak farklı etki göstermektedir. Bu farklılık gözetildiğinde, kişinin spesifik bir uyaranı veya uyaran grubunu kendisi için olumsuz ve rahatsızlık verici uyaran veya uyaranlar olarak algıladığı durumlar görülebilmektedir. Özellikle, duyuşal işleme hassasiyeti (DİH) yüksek seviyede olan kişiler, hem içsel süreçleri açısından (açlık, acı, ağrı, üzüntü, stres, vb.) hem de içinde buldukları fiziksel ortamın durumu açısından (yüksek ses, parlak ışık, keskin koku vb.) uyarıların olumsuz etkisini daha yoğun hissetmektedir. Öte yandan, duyuşal işleme hassasiyetinin olumlu etki ettiği durumların varlığı da göze çarpmaktadır. Bu bağlamda, duyuşal işleme hassasiyeti ile kişilik özellikleri arasındaki ilişki incelenmektedir. Kişilik kavramı, uluslararası alanyazında birçok farklı kuramcı tarafından farklı şekillerde açıklanmaktadır. Kişilik özelliklerinin tanımında ve anlaşılabilmesinde ortaya çıkabilecek karışıklığı önlemek amacıyla, bu derleme çalışmasında kişilik özellikleri Beş Faktör Kişilik Kuramı temel alınarak incelenmektedir. Beş Faktör Kişilik Kuramının kişilik tanımı çerçevesinde, beş temel kişilik özelliği ile duyuşal işleme hassasiyeti ve duyuşal işleme hassasiyetinin alt boyutları arasındaki ilişki incelenmektedir.

Anahtar sözcükler: Duyuşal işleme hassasiyeti, Beş Faktör Kişilik Kuramı, tepkisellik, kişilik özellikleri

Introduction

Sensory Processing Sensitivity (SPS) is a term introduced to the literature by clinical psychologists Aron and Aron (1997). Sensory processing sensitivity is defined as the individual's ability to be aware of internal and external stimuli which are experienced. Addedly, it contains creating behavioral and emotional reactions toward those stimuli (Aron et al. 2012). Individuals who are identified with high levels of sensory processing sensitivity are referred to as "highly sensitive individuals." Şengün-İnal and Sümer (2018) evaluate SPS based on potential internal and external stimuli that may affect the individual in their social or physical environment. Internal stimuli are expressed with concepts such as hunger, pain, sorrow, stress, etc. while external stimuli are expressed with concepts such as loud noise, bright light, sharp smell, etc. Highly sensitive individuals can be more aware in situations where others find it difficult to perceive or exhibit behavioral and emotional reactivity less frequently.

When the psychology literature on studies which examined SPS, Şengün-İnal and Sümer's review study (2018) identified six main headings related to SPS. These include personality traits, negative psychological effects, psychological well-being, neurobiological and genetic findings, person-environment interaction, and finally, observations of other findings in specific social environments such as home, workplace, and/or similar places. In light of the studies in the literature, the relationship between SPS and personality traits is examined in the context of various variables. When studies on SPS and personality traits are examined, it is observed that SPS is associated with three sub-factors: ease of excitation, low sensory threshold, and aesthetic sensitivity (Attary and Ghazizadeh 2021).

When international studies in the literature are examined, SPS has been found to be associated with both positive and negative personality traits. Positive personality traits are explained by factors that positively impact an individual's life and relationships with others. Negative personality traits, on the other hand, are explained by factors that make an individual feel uneasy and negatively affect their relationships with others. In individuals with high levels of SPS, the presence of positive personality traits such as aesthetic sensitivity, tendency towards art, empathy, and communication skills are observed (Ishikami and Tanaka 2022). Concepts that are positively influenced by sensitivity can distinguish individuals with high sensitivity positively from others (Ishikami and Tanaka 2022). On the other hand, some negative personality traits can also be observed in individuals with high levels of SPS. On the other hand, some negative personality traits can also be observed in people with high SPS levels. In particular, some negative personality traits are mentioned in individuals with a neurotic personality structure and high SPS levels. These traits include low self-esteem, unrealistic perfectionism, a pessimistic attitude, and sub-personality traits accompanied by depressive/melancholic states (McCrae and Costa 2008). In light of the findings, individuals with low tolerance for internal and external stimuli, characterized by high SPS, can easily feel discomfort and show physiological symptoms in response to negative stimuli occurring in their environment and affecting them. Additionally, individuals with high levels of aesthetic sensitivity, which is one of the sub-dimensions of SPS, are seen to manage their internal processes expressed as positive personality traits and demonstrate greater skills in self-awareness and self-definition, leading to positive reactions and behaviors (Ishikami and Tanaka 2022).

This review study aims to explain the relationship between SPS and personality traits by taking all these factors into account. It is wondered that whether the presence of SPS affects personality traits or not. For this purpose, studies written about on only SPS, only personality traits, and finally, the relationship between SPS and personality traits are examined in the international literature. The relationship between the concept of SPS and its sub-factors with the fundamental personality traits and sub-personality traits which are determined by the Five-Factor Personality Theory is investigated.

Sensory Processing Sensitivity

SPS is defined as being sensitive to weak stimuli and easily overstimulated by external stimuli (Malinakova et al. 2021). High levels of SPS are associated with an increase in stress-related problems. However, it also appears to increase one's ability to benefit from stimulating environments (Bas et al. 2021). Therefore, while the experience of being easily and overstimulated by external stimuli can have negative consequences, it can also contribute to the positive development of personality. When international literature is examined, SPS is associated with anxiety (Bakker and Moulding 2012), low levels of life satisfaction (Booth et al. 2015), and depression (Yano et al. 2019). On the other hand, studies discussing the relationship between SPS and positive personality traits are also found in the international literature. SPS involves increased sensitivity to internal and external stimuli, deeper cognitive processing, and higher emotional response or emotional intensity. SPS can bring positive qualities such as empathy, creativity, and a rich inner life, despite presenting some challenges in one's life.

Smolewska et al. (2006) presented three sub-dimensions of SPS: ease of excitation, low sensory threshold, and aesthetic sensitivity. Ease of excitation signifies being mentally overwhelmed by internal or external stimuli (e.g. feeling uncomfortable when many things happen at once). Low sensory threshold indicates unpleasant sensory arousal in response to intense stimuli such as loud noise and bright light (Smolewska et al. 2006, Lionetti et al. 2019). Finally, aesthetic sensitivity expresses awareness of the aesthetic aspects of the environment, unpleasant sensory arousal, and the feeling of irritation from external and internal stimuli, respectively (Chacon et al. 2021).

Some studies in the literature on SPS examined the relationships between SPS and biological factors. The most recent study examining the neurobiological etiology of SPS have been conducted by Acevedo et al. (2020). In this study using fMRI, it is reported that different parts of the brain are more active in individuals with high levels of SPS. Evidence from fMRI studies shows that individuals with high levels of SPS are more attentive to subtle sensory stimuli during the execution of visual perception tasks (Aron et al. 2010). When exposed to stimuli that

are relatively difficult to perceive, individuals with high SPS show more neural responses in areas responsible for sensory-motor activities in their brains (Acevedo et al. 2020).

Genetic studies suggest a positive relationship between SPS and genes associated with serotonin (Licht et al. 2011) and dopamine (Chen et al. 2011). According to Acevedo et al. (2020), carriers of the *s*-allele, especially those who feel good in their environment, function better psychologically and physically than those with the *l/l* genotype. Conversely, when exposed to environments where they perceive negativity for themselves, individuals carrying the *s*-allele are at a higher risk of various negative health outcomes such as anxiety or depression. In general, the reviewed studies indicate a strong positive relationship between SPS and genes that clearly distinguish individuals with high SPS from those with low SPS (Acevedo et al. 2020). Şengün-İnal and Sümer (2018) explained these genes as the serotonin transporter 5-HTTLPR gene and gene polymorphisms in the dopamine system (e.g. TH, DβH, SLC6A3, DRD2, NLN, NTSR1, NTSR2). It is stated that a person's level of SPS is positively associated with these genes and gene pairs. In conclusion, a strong positive relationship is mentioned between being a carrier of the 5-HTTLPR *s*-allele and developing SPS.

Personality Theories and the Five Factor Personality Theory

The concept of personality is explained in different ways by various psychologists and researchers. This diversity can lead to confusion when studying personality traits. When examining defined personality theories in the literature, some widely accepted theories can be identified. Allport (1937) believes that personality is biologically determined at birth and shaped by an individual's environmental experiences. Tsujioka and Cattell (1965) examine personality in 16 different categories, with considering relationships between sub-personality traits. Eysenck (1982) proposes a personality theory based on biological factors, arguing that individuals inherit a type of nervous system that influences their learning and adaptability to the environment. In this study, the widely used The Five Factor Personality Theory (The Big Five) is adopted when examining personality traits. McCrae and Costa (2008) reduce observed personality traits in individuals to five fundamental characteristics in the Five Factor Personality Theory. Five basic personality traits are discussed, and each basic trait is associated with specific sub-personality traits. This approach aims to explain personality in a generalizing yet individualizing manner. The five basic personality traits at the core of the theory are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each basic trait is created by clustering more specific personality traits that are related to each other. For instance, under the conscientiousness trait, there are more specific personality traits such as leadership skills, long-term planning ability, and technical expertise (McCrae and Costa 2008). In the scope of this review study, the relationship between SPS and personality traits is examined based on the Five Factor Personality Theory's five fundamental traits and the individualized personality structures beneath each trait.

Sensory Processing Sensitivity and Five Factor Personality Traits

Openness to Experience Personality Trait

Individuals who score high on the openness to experience trait tend to be intellectual, creative, sensitive, and open-minded. Those who score low on this trait tend to be realistic, insensitive, and traditional (Roccas et al. 2002). Openness to experience is characterized by the ability to adapt to new thoughts and actions. Individuals with this personality trait are more excited about innovations, and due to their open-minded nature, they develop a more tolerant attitude towards differences. On the other hand, individuals who are not open to experience tend to maintain their current situations. Their tolerance levels for changes in their physical and social environments are lower compared to those who are open to experience. Therefore, they adopt a more dissatisfied attitude towards differences. In a study measuring the relationship between SPS and openness to experience personality trait with self-assessment tests, individuals with high SPS are found to have passive openness to experience (Bröhl et al. 2022). Passive openness to experience is defined as openness to more internal developments that are not physically visible (Bröhl et al. 2022). Individuals with this trait experience strong emotions such as active imagination, enjoyment of music and art, admiration, high empathy, and interest. Moreover, they are found to be respectful of other people's values (beliefs, traditions, etc.). A similar relationship is also found in a study conducted in Japan by Yano et al. (2020). According to this study, individuals with the openness to experience personality trait have higher levels of aesthetic sensitivity. Aesthetic sensitivity is defined as a concept expressing the richness of an individual's inner life (Yano et al. 2020). Accordingly, while negative relationships are detected between openness to experience and the sub-dimensions of SPS, such as low sensory threshold and ease of excitation, a positive relationship is found between responsibility and

agreeableness basic factors and openness to experience. Based on these explanations, it is expected that individuals who are open to experience will have lower levels of ease of excitation and low sensory threshold.

In a study by Şengün-İnal et al. (2018), the mediating role of SPS in the relationship between attachment insecurity and The Big Five personality traits is examined. As a result of the research, individuals with high SPS are seen to engage in behavioral inhibition, avoiding themselves from new and uncertain developments. However, when the personality trait of openness to experience comes into play, an increase in the behavioral activation system is observed. Individuals who are open to experience are inclined to be easily stimulated by environmental stimuli. This stimulation is expressed as the level of SPS predicting behavioral activation or behavioral inhibition (Şengün-İnal et al. 2018). Individuals who are open to experience tend to be more responsive to new stimuli in their environment or internal lives and more creative in the face of situations. The relationship between SPS and behavioral inhibition/behavioral activation systems is one of the extensively studied correlations in the literature.

On the other hand, Reinforcement Sensitivity Theory developed by Jeffrey Gray (1982) emphasizes the importance of reward and punishment reinforcers in explaining personality. According to the theory, positively perceived stimuli activate the behavioral activation system, directing individuals towards new behaviors. Conversely, negatively perceived stimuli activate the behavioral inhibition system, preventing individuals from exhibiting new behaviors (Pickering and Corr 2008). When this difference in perception is interpreted, individuals who are open to experience tend to be more tolerant and patient towards new thoughts and behaviors arising from positively perceived stimuli. However, high levels of SPS increase the likelihood of perceiving stimuli negatively, leading to behavioral inhibition. Considering the results compiled from the examined studies, it is possible to speak of a negative relationship between SPS and the personality trait of openness to experience. Individuals with high SPS are more easily disturbed by stimuli and tend to maintain their current experiences rather than seeking novelty or development.

Conscientiousness Personality Trait

Conscientiousness is defined as the tendency to follow socially determined norms for impulse control, being goal-oriented, planning, and delaying gratification (Roberts et al. 2009). Individuals with the conscientiousness personality trait tend to discipline themselves, act with a sense of duty, and make efforts for success in response to precautions or external expectations. High conscientiousness is often perceived as stubbornness and task-oriented behavior, while low conscientiousness is associated with flexibility and spontaneity. However, it can also appear as carelessness and a lack of reliability (Toegel and Barsoux 2012). In a study by Lionetti et al. (2019) investigating the relationship between SPS and personality traits, they could not find a significant relationship between SPS and the conscientiousness personality trait. Tra et al. (2022) state that individuals with high SPS levels have low conscientiousness scores. Parallel to the study by Lionetti et al. (2019), Tra et al. (2022) emphasizes the weakness of the negative relationship between SPS levels and conscientiousness scores. Therefore, making an inference about the state of the conscientiousness personality trait based on participants' SPS levels would not be healthy. Brain imaging studies which show opposite findings of these two studies have been examined. It has been found that individuals with high SPS levels have more active brain regions related to action planning, self-control, their relationship with others, and the concept of empathy (Acevedo et al. 2014).

Considering findings from brain imaging studies such as these, the identification of a weak negative relationship or the absence of any significant relationship between SPS levels and the conscientiousness personality trait can be considered a surprising result. Bröhl et al. (2022) conducted a study categorizing the factors of the conscientiousness personality trait as competence, orderliness, sense of duty, effort for success, and dedication. It is stated that participants identified as having high SPS levels scored below average in all factors (Bröhl et al. 2022). In another study, it is mentioned that individuals with high SPS levels have lower levels of the conscientiousness personality trait compared to other personality traits (Yano et al. 2020). In the same study, although a weak positive relationship was detected between SPS levels and the conscientiousness personality trait among Japanese participants, this weak positive relationship can be attributed to cultural differences in personality traits. Among the sub-dimensions of SPS, only aesthetic sensitivity is found to be positively associated with the conscientiousness personality trait. No relationship can be observed in either direction between low sensory threshold, ease of excitation, and conscientiousness (Attary and Ghazizadeh 2021).

In conclusion, there are rare studies indicating a very weak negative or, again, a very weak positive relationship between SPS and the conscientiousness personality trait. However, in the majority of the studies, no significant relationship can be detected. In other words, there are no any situation that can affect the relationship between SPS and the conscientiousness personality trait. Being high or low of SPS level is not sufficient for us to make an

interpretation about the conscientiousness personality trait. For instance, Grimen and Diseth (2016) did not include the conscientiousness personality trait in their studies while examining the relationship between SPS and personality traits, as taking into account the results from previous research. However, when the results of the study conducted by Yano et al. (2020) with Japanese participants are compared with the results of other studies centered in Europe and America, it is seen that cultural factors contributing to personality formation can also affect conscientiousness scores. Yano et al. (2020) detected a weak positive relationship between SPS and the conscientiousness personality trait. It is considered that the found positive relationship is due to the Japanese population generally being raised in a society with conscientiousness.

Extroversion Personality Trait

Extroversion personality trait is defined as a tendency to exhibit outgoing behaviors towards social stimuli, has sub-dimensions such as social skills, numerous friendships, entrepreneurial professional interests, active participation in team sports, and club memberships (McCrae and Costa 2008). There is a negative relationship between the sub-dimension of SPS which is ease of excitation and the extroversion personality trait (Ahadi and Basharpour 2010). Ease of excitation refers to individuals' ability to be aware of stimuli in their physical and social environment and to be stimulated more quickly than others. The negative relationship between ease of excitation and the extroversion personality trait is surprising because individuals who are easily stimulated are expected to be more extroverted. However, when the aspect of ease of excitation involving the individual's ability to perceive irritating stimuli is considered, the understanding of the negative relationship becomes easier. Individuals described as extroverted show higher sensitivity to stimuli occurring in their physical and social environments. In case of high SPS levels, these stimuli are often perceived as disturbing stimuli. The reaction to stimuli reveals the discomfort felt by the individual from the stimulus. Therefore, individuals with high SPS levels adopt an avoidant attitude rather than being extroverted. Thus, it can be concluded that there is a negative relationship between SPS and extroversion. This statement aligns with the findings of a study by Liss et al. (2008). According to the research findings, individuals with low sensory thresholds, meaning those who can perceive even the slightest stimulation, show weaknesses in social skills and communication skills. In the light of the definition of extroversion, expressed as the tendency to exhibit outgoing behaviors towards social stimuli (McCrae and Costa 2008), it can be said that as SPS levels increase, the sub-factors of the extroversion personality trait weaken.

In examining the relationship between SPS and the extroversion personality trait, it is necessary to mention introversion, which represents the opposite of extroversion. Introversion is the state of satisfaction derived from one's own mental life. Introverts are typically perceived as more reserved or thoughtful. When focusing on the differences between the two traits, the main focus of an introverted individual is on their own mental activities. The person is within the inner world of thoughts and concepts. The primary focus of an extroverted person, on the other hand, is on the people and physical activities in contact with their experiences. In other words, it is the external world (Myers and Myers 1980). In a neuroscience study, a positive relationship was found between introversion and SPS. Rizzo-Sierra et al. (2012) state that individuals with strong neural connections have high sensitivity to perceiving stimuli. They mention that individuals with this sensitivity tend to be more cautious, submissive, sensitive, artistic, understanding, and introverted. In a study using the SPS scale, Bas et al. (2021) found that participants with high SPS levels described themselves as individuals seeking introverted and quiet environments due to excessive ease of excitation. Therefore, individuals with high SPS levels are seen to be more inclined towards introversion rather than extroversion. In conclusion, a strong negative relationship is mentioned between SPS and the extroversion personality trait.

Agreeableness Personality Trait

Agreeableness is defined as a personality trait that manifests itself in individual behavioral characteristics such as being kind, sympathetic, collaborative, warm, outspoken, and thoughtful (Thompson 2008). Conceptually, agreeableness seems to be a dimension related to interpersonal relationships. Specifically, it is examined as a personality trait related to maintaining positive relationships with others (Digman 1990). Individuals scoring high on the agreeableness dimension are considered empathetic and altruistic. Low agreeableness scores are associated with selfish behavior and lack of empathy. Those scoring very low on agreeableness are considered prone to manipulative and competitive behavior rather than collaboration (Bamford and Davidson 2019).

When the relationship between the agreeableness personality trait and SPS is reflected in the literature, Bröhl et al. (2022) state in their research that the agreeableness scores of overly sensitive participants were found to be at an average level. They also add that a statistically significant relationship cannot be mentioned between

the agreeableness personality trait and SPS level (Bröhl et al. 2022). The researchers express that examining the potential moderating effect of the agreeableness personality trait in future studies on SPS and personality traits could be interesting (Bröhl et al. 2020). In a study conducted by Ahadi and Basharpour (2010), no statistically significant relationship was found between SPS and the agreeableness personality trait. In the study by Grimen and Diseth (2016), which examined the relationship between SPS and personality traits, it is observed that they did not include the agreeableness personality trait, for which there was no significant positive or negative relationship found in previous research. Therefore, it is considered that there is no positive or negative relationship between SPS and agreeableness personality trait.

Smolewska et al. (2006) examined the relationship between the three sub-components of SPS and behavioral inhibition and personality traits. The study does not mention a relationship between the agreeableness personality trait and the sub-components of SPS. While the aesthetic sensitivity sub-component has a strong positive relationship with the openness to experience personality trait, the ease of excitation and low sensory threshold sub-components are found to have a strong positive relationship with the neuroticism personality trait (Smolewska et al. 2006). In a study parallel to the research by Smolewska et al. (2006), Yano et al. (2020) examined the same three components of SPS and the relationship between the components and personality traits. In the findings of the study, a negative relationship was found between the agreeableness personality trait and ease of excitation and low sensory threshold. The aesthetic sensitivity component, on the other hand, was found to be positively but moderately related to the agreeableness personality trait.

A valuable finding that differs from the previous ones was reached by Tra et al. (2022). In the study comparing participants with high and low SPS levels, it was found that agreeableness scores of individuals with high SPS levels were higher than those of participants with low SPS levels. On the other hand, it is observed that the sensitivity score of female participants is higher than that of male participants. In the study by Tra et al. (2022), this positive relationship between the agreeableness personality trait and SPS can be explained by the fact that individuals with SPS value the behaviors, reactions, or comments of others in situations where they perceive negativity. Rather than their own wills, because they cannot predict how they will behave or execute planned behaviors in a given situation. In other words, it can be said that they make an effort to get rid of the negative experience they are experiencing by behaving in an agreeable way with other people in their environment.

In conclusion, it can be said that although there is variability in a positive or negative direction according to the sub-dimensions of SPS, no significant positive or negative relationship can be detected between high SPS levels and the agreeableness personality trait. In a few studies, a low to moderate positive relationship can be detected. Generally, no statistically significant relationship can be observed between SPS and the agreeableness personality trait. Only a moderately positive relationship is mentioned between the aesthetic sensitivity, one of the sub-dimensions of the SPS concept, and the agreeableness personality trait (Yano et al. 2020). This study conducted in Japan (Yano et al. 2020) is considered once again as a cultural difference, similar to the case of the conscientiousness personality trait.

Neuroticism Personality Trait

Neuroticism is a personality trait found in many models in personality theory. It is particularly defined in terms of rapid arousal when faced with negative emotional stimuli and a tendency to relax more slowly when aroused. In contrast to emotional stability and positivity or good adaptation, it focuses on emotional instability and negativity or maladjustment. It is also defined as a lack of self-control, inability to manage psychological stress, and a tendency to complain (Ormel et al. 2012). Individuals with high scores on neuroticism scales tend to be emotionally unstable, show intense reactivity in stressful situations, and have a contrary and irritable disposition as a temperament trait (Passer and Smith 2009). The sub-factors of the neuroticism personality trait are determined as low self-confidence, unrealistic perfectionism, pessimistic attitude, sadness, guilt feelings, and intense unhappiness (McCrae and Costa 2008). According to Attary and Ghazizadeh (2021), there is a positive and strong relationship between SPS and the neuroticism personality trait. Similarly, Lionetti et al. (2019) state in the results of their study that participants with high SPS scores show more intense reactivity to new and unusual situations. There is a positive relationship between the concepts of ease of excitation and low sensory threshold, which are sub-dimensions of SPS, and the neuroticism personality trait. However, a negative relationship is found between aesthetic sensitivity and neuroticism (Lionetti et al. 2019). Examining the findings of another study, Bröhl et al. (2021) found that individuals with high SPS according to self-assessment tests tend to experience anxiety and depression.

When the international literature is reviewed, it is observed that anxiety and depression pathologies accompany neurotic personality disorder. Therefore, individuals with both high SPS and neurotic personality structure are

more likely to develop anxiety and depression. In a study examining the connection between the concept of excessive sensitivity, similar to SPS, and anxiety/depression, Liss et al. (2008) state that the factors of ease of excitation and low sensory threshold, which are sub-dimensions of SPS, are associated with anxiety and depression. The interaction between SPS and other pathologies is explained through findings such as weak social skills, attention to details, weak communication (symptoms of autism), and difficulty in identifying emotions (symptoms of alexithymia) (Liss et al. 2008).

In the context of the relationship between SPS and the neuroticism personality trait, a positive and strong relationship between many aspects of the neuroticism personality trait and SPS is explained (Tra et al. 2022). Ahadi and Basharpour (2010) examined the triple relationship between SPS, personality traits, and mental health. Accordingly, it is stated that ease of excitation directly determines the neuroticism personality trait. All participants who scored high on ease of excitation also had the neuroticism personality trait (Ahadi and Basharpour, 2010). Additionally, Tra et al. (2022), examining the impact of high SPS levels on personality traits, state that participants described as having high SPS levels exhibit unpleasant emotions, anxiety, irritability, a tendency to be easily disappointed, excessive behavioral response to problems and negative events, high stress response, and an anxious-avoidant behavioral style. When SPS and the neuroticism personality trait are considered together, researchers Kajdzik and Moron (2023) are curious about the attitude that neurotic individuals showing narcissistic tendencies can display in their relationships with others. In their study with participants with high SPS scores, the researchers measured the impact of being excessively sensitive on others. When examining the research findings, it was found that participants showing both SPS and the neuroticism personality trait were manipulative towards others (Kajdzik and Moron 2023). Kajdzik and Moron (2023) evaluated cases where high SPS levels combined with the neuroticism personality trait. It is mentioned that individuals who are subjects of these cases are more likely to show narcissistic and psychopathic tendencies compared to participants who do not have both SPS and the neuroticism personality trait at the same time (Kajdzik and Moron 2023). Therefore, individuals with both high SPS levels and the neuroticism personality trait can establish relationships with others only to meet their special arousal needs. The main result reached in the analysis of these relationships is that individuals manipulate others for their aim of self-satisfaction (Kajdzik and Moron 2023). Especially, the concepts of ease of excitation and low sensory threshold, sub-dimensions of SPS, are mentioned by many researchers as predictors of the neuroticism personality trait. Finally, individuals with high SPS levels are seen as highly predisposed to the neuroticism personality trait. In conclusion, a very strong positive relationship is mentioned between SPS and the neuroticism personality trait.

Discussion

SPS is the sensitivity of an individual to react emotional responses or behaviors to stimuli affecting them in their internal or external world (Aron et al. 2012). Individuals who are identified as highly sensitive people whose SPS scores are high are often quick to notice stimuli that others may not notice or, if noticed, may not react intensely to. Throughout this article, it has been evaluated that individuals with high SPS are more sensitive to experiencing negative psychological and physiological experiences. Individuals who have developed SPS have lower sensory thresholds, being excited more easily compared to others and may face with challenges such as intense anxiety, difficulties in emotion regulation, and making impulsive decisions when faced with stimuli. On the other hand, individuals with SPS can also experience positive outcomes. Especially individuals with high levels of aesthetic sensitivity, a sub-dimension of SPS, are seen to be more advantageous in developing communication skills and predisposed to art compared to individuals who are not overly sensitive (Ishikami and Tanaka 2022). In this study, the relationship between SPS and personality traits is examined based on the Five Factor Personality Theory. The Five Factor Personality Theory explains personality based on five traits and associated sub-traits, namely openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae and Costa 2008). Therefore, this study focused on the relationships between SPS and the five personality traits.

Studies reviewed generally indicate a negative relationship between SPS and openness to experience personality trait. Individuals who are open to experience are expected to be tolerant to stimuli and excited about innovations. In contrast, individuals with high SPS are described as more intolerant and impulsive in the face of stimuli, as explained in the relevant section. Therefore, the negative relationship between SPS and openness to experience is reasonable. However, findings also suggest that individuals with high SPS may demonstrate passive openness to experience (Bröhl et al. 2022). In this case, individuals with high SPS may find it challenging to cope with changes in their physical environments but may find changes in their inner worlds that they control more tolerable. Stimuli that prompt individuals to behave or think in unwanted ways are perceived as irritating and

burdensome, making it easy for the individual to be influenced by negative emotions and behaviors. However, when a change or new stimulus occurs in their inner world, the individual may find it more tolerable if they perceive that the situation will proceed entirely under their control and they can predict what the future holds. It is what it is by trying to be explained as passive openness to experience.

In studies comparing the personality trait of conscientiousness and SPS scores, a very low level positive relationship is seen between the two concepts, or often no significant relationship can be seen. (Lionetti et al. 2019, Tra et al. 2022). Conscientious individuals are characterized by traits such as planning, acting towards goals, and being disciplined (Acevedo et al. 2014). However, individuals with high SPS are generally described as impulsive, erratic, and incompetent in planning and making efforts for the future (Acevedo et al. 2014). When these two findings are combined, it is interpreted that individuals with high aesthetic sensitivity scores among the sub-dimensions of SPS may exhibit low-level conscientious behavior. While individuals with ease of excitation and low sensory threshold may struggle to fulfill the requirements of the conscientiousness personality trait. In situations where individuals can easily feel discomfort and irritation due to stimuli, they may not be able to preserve the abilities required for conscientiousness, such as common sense, composure, and planning, to continue activities and exhibit appropriate behaviors.

Individuals with extraversion personality trait react reasonably and participatively to stimuli they face. Concepts such as ease of excitation and low sensory threshold as SPS sub-dimensions are found to have a negative relationship with the extraversion personality trait (Ahadi and Basharpour 2010). In other words, individuals with high SPS, who have difficulty adapting to disturbing stimuli and uncertain new life situations, are found to have introverted personality traits rather than extroverted ones. On the other hand, the aesthetic sensitivity score, another sub-dimension of SPS, allows individuals to develop an introverted personality structure because individuals with aesthetic sensitivity enjoy activities they can do on their own. They try to be more aware of their internal processes and strive to be more conscious of who they are. Individuals with aesthetic sensitivity can perform more in-depth analysis in terms of cognitive processing. Therefore, individuals with SPS are more prone to introversion personality trait (Bas et al. 2021).

When examined the relationship between agreeableness which is another personality trait of the Five Factor Personality Theory, and SPS in studies, no positive or negative relationship can be detected between these two variables (Bröhl et al. 2021). Whether SPS is low or high is not sufficient to make a comment about an individual's agreeableness level. Only Yano et al. (2020) were able to identify an average level of positive relationship between aesthetic sensitivity scores and agreeableness; however, no statistically significant relationship is found between ease of excitation and low sensory threshold terms of SPS and agreeableness personality trait. The reason for this might be that individuals who can easily be aroused and experience irritation from perceived negative stimuli may be insufficient in reflecting sub-personality traits of agreeableness, such as friendliness, sharing the feelings of others, and kindness. It is observed that individuals with these characteristics have difficulty in establishing relationships with other people in this way.

Finally, a strong positive relationship is found between SPS and the personality trait of neuroticism (Attary and Ghazizadeh 2021). The SPS score is considered as a predictor for the neuroticism personality trait (Ahadi and Basharpour, 2010). In other words, individuals with high SPS are likely to have developed a neurotic personality structure. Especially, the concepts of ease of excitation and low sensory threshold are associated with neurotic personality. When more specific personality dimensions, such as fluctuations in emotion, irritation, intense anxiety, impulsive movements, high stress, nerves, and exaggerated reactions to negative situations, are taken into account, individuals with high SPS are associated with neuroticism. The strong presence of the low sensory threshold as a sub-dimensions of SPS facilitates the formation of such emotional experiences. On the other hand, individuals with strong empathic skills who exhibit neurotic personality traits may sometimes develop a manipulative personality structure (Kajdzik and Moron 2023). Neurotic individuals with strong empathic skills can use their communication skills and ability to understand and direct the emotions and thoughts of others for their own benefit. Therefore, individuals with high SPS may direct others according to their own interests, continuing communication only if others respond to their demands.

In conclusion, individuals with high SPS generally tend to have a passive openness to experience, low levels of conscientiousness, introverted personality structure rather than extroverted, and neurotic personality traits based on the Five Factor Personality Theory. When the relationships between the five personality traits and the sub-dimensions of SPS, such as ease of excitation, low sensory threshold, and aesthetic sensitivity, are examined, ease of excitation and low sensory threshold are especially considered as symptoms of the neuroticism personality trait. In other words, it is stated that the concept of SPS accompanies the neurotic personality structure. Considering situations where individuals easily notice stimuli (low sensory threshold) and feel

discomfort from these stimuli (ease of excitation), the findings become more understandable. The concept of aesthetic sensitivity is more related to passive openness to experience. Accordingly, individuals with a tendency to art or well-developed empathic skills are considered to be more open to new experiences and developments that they can carry out on their own.

Conclusion

The compiled findings from various studies discussed in this review are expected to contribute to future research examining the relationship between SPS and personality traits. However, it is noted that quantitative research methods are frequently used in the examination of the relationships between SPS and personality traits. To access deeper dimensions of personality, it is considered beneficial to fill an important gap in the literature by conducting studies using qualitative research methods. As mentioned in the articles and books used in this review, cultural differences and gender distinctions also can influence both personality traits and SPS levels. When evaluated in the context of cultural influence, the majority of previous studies were conducted with American and European participants. Although a few studies conducted in Asian countries (Ahadi and Basharpour 2010, Yano et al. 2020, Attary and Ghazizadeh 2021, Ishikami and Tanaka 2022) generally yielded similar results, the presence of minor cultural differences is noteworthy. It is deemed necessary for future research to consider the potential impact of these factors to achieve more reliable and valid findings. Moreover, gender differences are observed to be influential both on SPS levels and in the context of personality traits. It is thought that comparative studies focusing on gender differences in future research would be useful.

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Authors Contributions: The author(s) have declared that they have made a significant scientific contribution to the study and have assisted in the preparation or revision of the manuscript

Peer-review: Externally peer-reviewed.

Conflict of Interest: No conflict of interest was declared.

Financial Disclosure: No financial support was declared for this study.