

The Relationship Between Self-Reported Sensory Experiences and Personality

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Introduction

Sensory gating, a type of sensory processing, refers to the brain's ability to selectively respond to incoming sensory stimuli. Novel information typically results in an orienting response, whereas redundant information typically results in inhibition or filtering. Past research has focused on event-related potentials (ERPs) from electroencephalogram (EEG) recordings to measure sensory gating. Sensory gating may be related to or influenced by an individual's psychiatric history (Javitt & Freedman, 2015), and even one's personality (Yadon & Daugherty, 2019); however, there is minimal research regarding the relationship between sensory processing and personality. The Big Five Inventory (BFI) is a self-report personality questionnaire that contains five dimensions of personality (Extraversion, Agreeableness, Neuroticism, Openness, and Conscientiousness). Traits that are associated with Extraversion, Agreeableness, Neuroticism, Openness, and Conscientiousness are sociability, forgiving, moody, curious, and organized, respectively. Yadon & Daugherty (2019) found that sensory gating, measured by ERPs, was related to the BFI's Conscientiousness, but not Neuroticism.

In addition to physiological measures, questionnaires are also used to measure self-reported sensory sensitivity and sensory experiences. For example, the Sensory Gating Inventory (SGI) has been used as a self-reported measure of sensory gating (Hetrick et al., 2012). It is unclear how SGI scores relate to the physiological measure of sensory gating utilizing ERPs. The Highly Sensitive Persons Scale (HSPS) is another self-report questionnaire designed to measure sensory processing sensitivity and has been related to the BFI personality dimensions. In a study that incorporated both the BFI and the HSPS, results found that increased sensitivity was related to Introversion (Aron and Aron, 1997). Interestingly, Yadon and Daugherty (2019) found that only Conscientiousness (but not Neuroticism) was positively correlated to sensory gating. The Adult Sensory Processing Scale (ASPS) is newer and is being sequentially underexplored. The current study aims to better understand the relationship between sensory processing and personality, specifically using the SGI, which has not been utilized for this purpose. Potentially being able to capture the essence of what is being measured physiologically in a self-reported questionnaire would be beneficial both in terms of time and resources.

Methodology

In this study, 43 participants were recruited from Introductory Psychology courses at Missouri State University. This study was administered in the form of a confidential online survey accessed through the SONA System, linked to Qualtrics. After providing informed consent, participants completed the Sensory Gating Inventory (SGI), Highly Sensitive Person Scale (HSPS), Adult Sensory Processing Scale (ASPS), Big Five Inventory (BFI), along with a demographic questionnaire. To prevent order effects, questionnaires were counterbalanced.

Sample Items

Sensory Gating Inventory
Never True (0) 1 2 3 4 Always True (5)
• Every now and then colors seem more vivid to me than usual.
• I find it hard to concentrate on just one thing.

Adult Sensory Processing Scale
Never (1) Rarely (2) Sometimes (3) Often (4) Always (5)
• I have low tolerance to innocuous ordinary environmental sound
• I do not like to wear turtle necks.

Highly Sensitive Person Scale
Not at all (1) 2 3 Moderately (4) 5 6 Extremely (7)
• Are you easily overwhelmed by strong sensory input?
• Are you made uncomfortable by loud noises?

Big Five Inventory
Disagree strongly (1) Disagree a little (2) Neither agree nor disagree (3) Agree a little (4) Agree strongly (5)

I See Myself as Someone Who...

- Gets nervous easily
- Is talkative

Results

A Pearson-product moment correlation was utilized to assess the relationship between self-reported sensory experiences and personality. The percentage of missing data on the questionnaires was very low. Missing data points were deleted for that participant's specific questionnaire(s). A total of eight participants contained missing data.

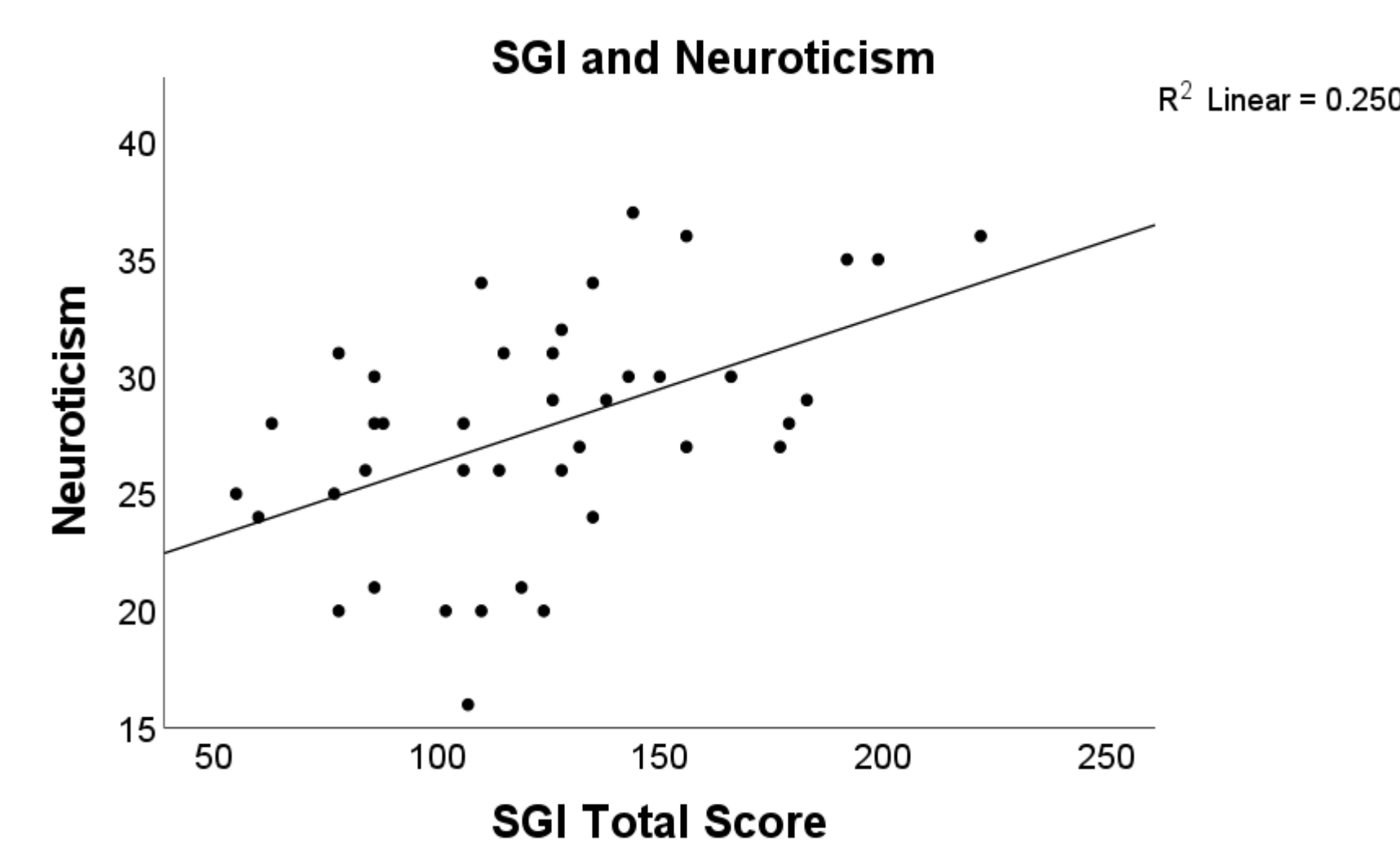


Figure 1

- A positive correlation was found between SGI Total scores and BFI Neuroticism ($r = .500, p < .001^*$).

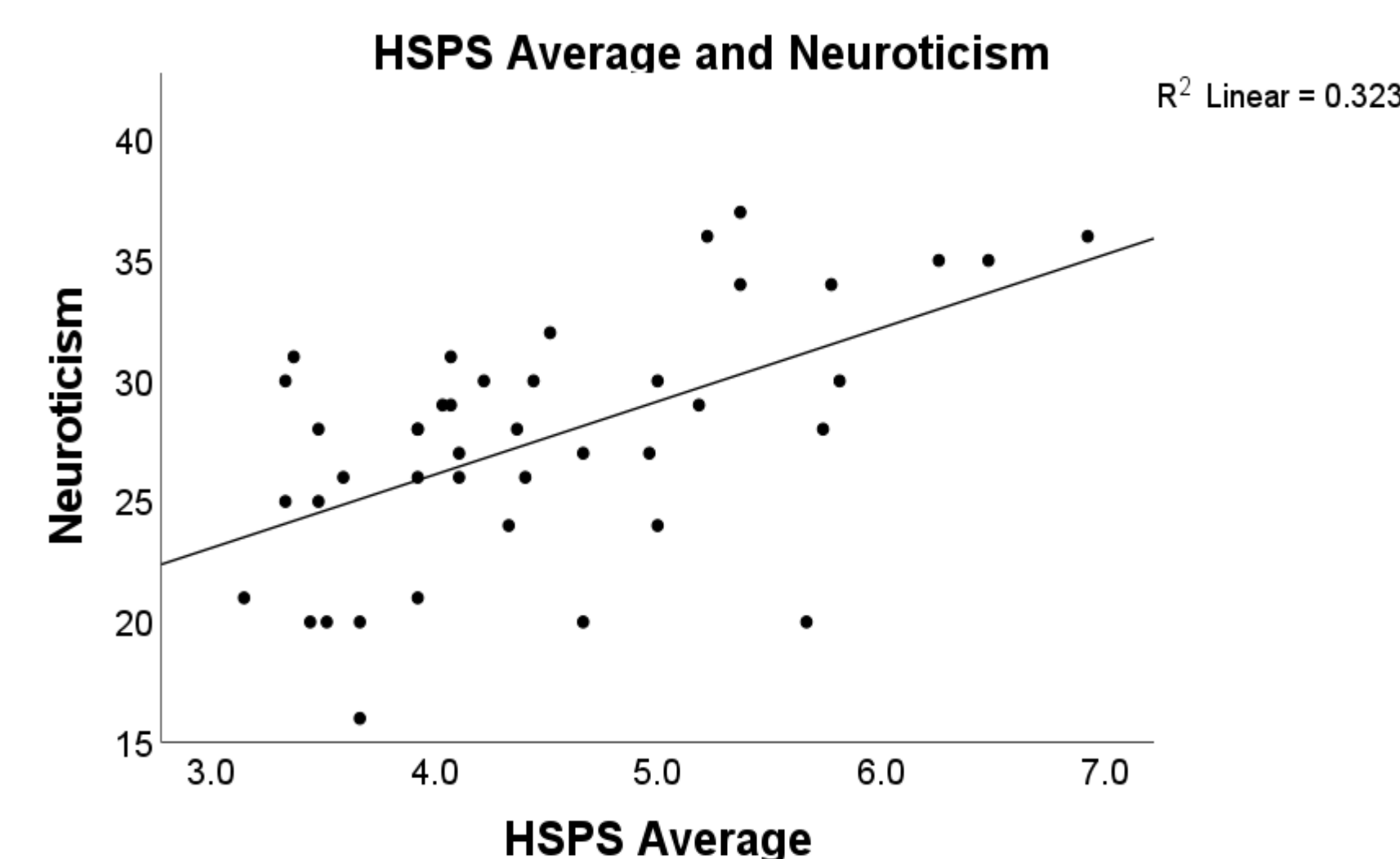


Figure 3

- A positive correlation was found between HSPS Average scores and BFI Neuroticism ($r = .568, p < .001^*$).

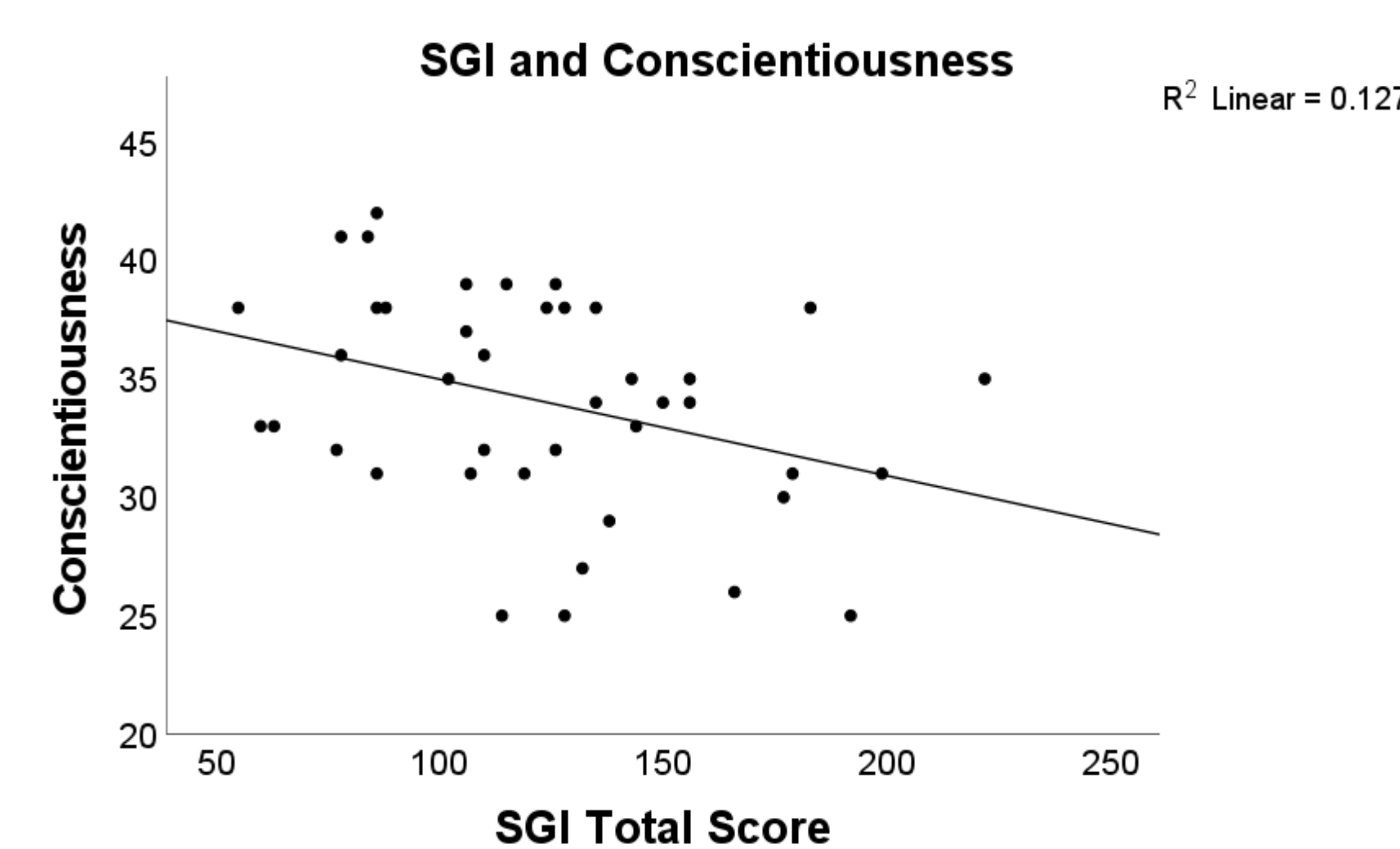


Figure 2

- A negative correlation was found between SGI Total Scores and BFI Conscientiousness ($r = -.356, p = .022$).

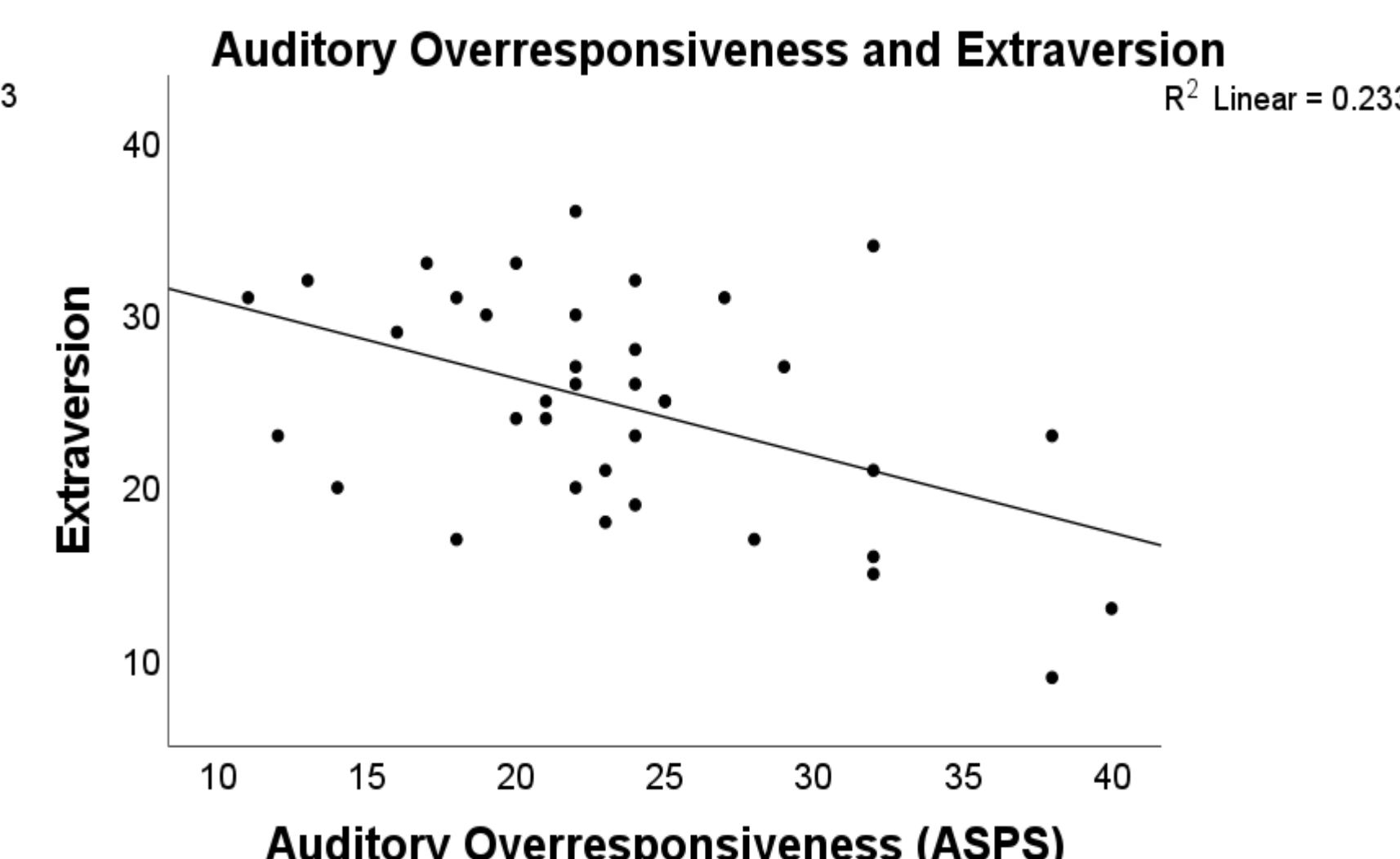


Figure 4

- A negative correlation was found between ASPS Auditory Overresponsiveness scores and BFI Extraversion ($r = -.483, p = .002^*$).

	Extraversion	Agreeableness	Neuroticism	Openness	Conscientiousness
SGI Total	$r = -.339$ $p = .030$	$r = -.271$ $p = .087$	$r = .500$ $p < .001^*$	$r = .346$ $p = .027$	$r = -.356$ $p = .022$
HSPS Average	$r = -.371$ $p = .016$	$r = -.149$ $p = .345$	$r = .568$ $p < .001^*$	$r = .257$ $p = .100$	$r = -.212$ $p = .179$
ASPS Auditory Over- repsonsiveness	$r = -.483$ $p = .002^*$	$r = -.270$ $p = .106$	$r = .413$ $p = .011^*$	$r = .107$ $p = .529$	$r = -.341$ $p = .039$

Table 1: Results of a correlation analysis, assessing the relationships between BFI personality dimensions and self-report sensory processing measurements

*Significant after Bonferroni correction for each set of comparisons with adjusted alpha of .01

Discussion

Our study assessed the relationship between self-reported sensory experiences and personality, measured through the SGI, HSPS, ASPS, and the BFI. We found, similar to Yadon and Daugherty (2019), that Conscientiousness was associated with a higher SGI score (increased sensory gating ability); this was approaching significance when using the more stringent adjusted alpha. However, the results from the SGI in the present study (unlike the 2019 study) suggested a relationship between self-reported sensory gating and Neuroticism. Specifically, a lower SGI score (decreased sensory gating) was associated with higher Neuroticism. The differing results suggest that self-reported sensory gating may measure a different construct than the physiological measure we call sensory gating. Our study also found that being overresponsive to auditory input (measured by the ASPS) was negatively correlated with Extraversion, meaning the more overresponsive a person is to auditory input, the more introverted they tend to be.

Our study also found a significant positive correlation between HSPS scores and Neuroticism and was approaching significance for Extraversion. This suggested that greater sensory sensitivity was associated with higher levels of Neuroticism and Introversion. Both of these findings support the findings by Aron and Aron (1997). As replicated by previous research, the correlation between the SGI and HSPS suggests that lower SGI scores are associated with a person being more highly sensitive (Hetrick et al., 2012).

Overall, this study provided additional evidence that sensory processing (sensory sensitivity in particular) is related to the big five personality traits, most notably Neuroticism. Future research should attempt to explain the differences between self-reported and physiological measures of sensory gating. Further, an increased understanding of the relationship between sensory sensitivity and personality could be used to help explain and predict behavior in highly sensitive and sensory reactive individuals.

References

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