

Investigating the Relationship between Sensory Processing Sensitivity and Social Anxiety Tendencies among Adults

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ABSTRACT

Background: Sensory Processing Sensitivity is a biologically rooted temperament dimension characterized by deep cognitive processing, strong emotionality, and increased sensitivity to subtle environmental stimuli. Sensory Processing Sensitivity has been associated with anxiety and internalizing symptoms, but the relationship between Sensory Processing Sensitivity and Social Anxiety Tendencies has not been studied extensively, especially among non-western populations. In collectivist cultures such as Pakistan, people with high Sensory Processing Sensitivity may be more susceptible to discomfort with social interactions because of societal pressures and fears of evaluate engagement.

Objective: The present research sought to examine the relationship between Sensory Processing Sensitivity and Social Anxiety Tendencies within an adult population in Pakistan, using the Joint Vulnerability Model framework or lens. Based on this, we proposed that higher levels of SPS would significantly predict greater levels of Social Anxiety Tendencies.

Methods: The research employed a correlational design in cross-sectional form, using a final sample of 300 adults (100 males, 200 females), between 18-40 years of age, who volunteered from a convenience sample. Participants completed the Highly Sensitive Person Scale (HSPS) and the Social Anxiety Questionnaire for Adults (SAQ-A30). Reliability of the instruments was assessed using Cronbach's alpha, and descriptive statistics, Pearson correlation, and linear regression were conducted using SPSS.

Results: The findings indicated good internal consistency for SPS ($\alpha = .97$) and SAT ($\alpha = .95$). A moderate, positive correlation was identified between SPS and SAT ($r = .240, p < .01$). Regression analysis verified an important predictor of SAT, SPS ($\beta = .23, p < .001$), and accounted for 5.9% of variance ($R^2 = .059$). These results indicate that individuals with high sensory sensitivity are more likely to have increased symptoms of social anxiety.

Conclusion: Sensory Processing Sensitivity significantly predicts Social Anxiety Tendencies. Clinicians should consider sensory traits in treatment, and future research should explore this link longitudinally.

Keywords: Sensory Processing Sensitivity, Social Anxiety Tendencies, Highly Sensitive Person, Temperament, Joint Vulnerability Model, Pakistan, Trait Vulnerability.

INTRODUCTION

Sensory Processing Sensitivity is a temperamental trait that reflects individual differences in the depth of processing, emotional responsiveness, and sensitivity to subtle stimuli in the environment. First conceptualized by Aron and Aron (1997), this innate characteristic is thought to be biologically rooted

and relatively stable across the lifespan. Highly sensitive individuals (HSIs) often exhibit greater awareness of environmental cues, stronger emotional reactivity, and a tendency to become easily overstimulated in high-stimulus settings (Aron et al., 2012). These individuals process sensory information more deeply, respond intensely to both positive and negative stimuli, and often report feeling overwhelmed by external demands or emotional experiences. Although Sensory Processing Sensitivity is not considered a disorder, it represents a form of heightened environmental responsiveness that, when combined with environmental stressors, may elevate the risk for psychological vulnerabilities, especially in socially challenging or invalidating contexts. In contrast, Social Anxiety Tendencies refer to persistent fears of social judgment, embarrassment, or rejection in interpersonal situations. Individuals with high social anxiety often fear negative evaluation, avoid social interactions, and experience significant emotional distress in performance or evaluative settings (Clark & Wells, 1995; Hofmann et al., 2004). Social anxiety is recognized as a prevalent and debilitating psychological concern that can impair one's academic performance, interpersonal functioning, and overall well-being. Importantly, social anxiety is dimensional in nature, existing along a continuum from mild discomfort in social settings to clinically significant social anxiety disorder. Understanding the contributing factors to these tendencies is therefore critical for early identification and intervention.

The Environmental Sensitivity Theory (Pluess, 2015) and Joint Vulnerability Model (Eley & Stevenson, 2000) offer explanatory frameworks for how Sensory Processing Sensitivity may contribute to the development of social anxiety. According to these models, individuals with heightened sensory sensitivity may not only react more strongly to adverse social experiences but also perceive neutral or mildly negative interactions as highly threatening. In such individuals, the fear of being judged or humiliated may become intensified due to their biologically based hyperawareness and deep emotional processing. Consequently, when placed in high-demand social situations, HSIs may be at greater risk for developing avoidance behaviors, social withdrawal, and maladaptive thought patterns consistent with social anxiety tendencies. Moreover, Sensory Processing Sensitivity has been linked to increased emotional dysregulation, rumination, and internalizing symptoms (Ahadi & Basharpour, 2010), all of which are associated with heightened social anxiety.

Even though a number of studies in Western countries have found associations between SPS and internalizing problems (like depression, anxiety, and stress) (Liss et al., 2005; Benham, 2006; Booth et al., 2015), few studies have specifically examined the relationship between SPS and social anxiety. Moore and Campbell (2018) showed that SPS was positively related to greater fear of negative evaluation, social inhibition, and interpersonal avoidance. Greven et al. (2019) noted that, while Sensory Processing Sensitivity is adaptive in supportive environments, it can become a liability in socially evaluative or emotionally invalidating situations. However, while there is increasing interest in understanding SPS as a predictor of emotional functioning, its impacts on Social Anxiety Tendencies have not been adequately explored. Moreover, this seems especially relevant in relation to collectivist cultures (like Pakistan) where social connections and community judgments often matter to a greater degree culturally.

In Pakistan, where social harmony, familial approval, and community reputation matter greatly, individuals with pronounced Sensory Processing Sensitivity may diverge in their experience. The onslaught of social obligations and judgmental social interactions and constraints stemming from social norms may exacerbate their susceptibility to social anxiety. Cultural perspectives on emotional expression may worsen ambivalence toward seeking help, commonly indicating withdrawal and internalizing symptoms for individuals as style. Thus, an important question is to see how the variable sensitivity operates equivalently in non-Western populations and determine whether it is a relatively strong variable predicting social anxiety propensity. The

Present study addresses this empirical gap by investigating the relationship between Sensory Processing Sensitivity and Social Anxiety Tendencies in a sample of Pakistani adults. Informed by the Joint Vulnerability Model, the research proposes a stronger hypothesis that sensory processing sensitivity will predict social anxiety tendencies in a positive and significant manner; therefore, higher levels of sensitivity would indicate higher social anxiety symptoms. This study hopes to extend the limited research literature specific to these two constructs and provide cultural relevance to the literature and its psychological usefulness (i.e., inform early screening and mental health intervention) for highly sensitive people in collectivist societies.

METHODS

The current study utilized a cross-sectional correlational research design in order to examine the link between Sensory Processing Sensitivity (SPS) and Social Anxiety Tendencies (SAT) among adulthood. A sample of 300 adults (100 males and 200 females) aged 18 to 40 years were recruited through convenience sampling at several educational institutions and public venues in Rawalpindi and Islamabad. Individuals with identified psychological disorders were excluded from the study. To examine Sensory Processing Sensitivity (SPS) a 27-item, 7-point Likert scale, Highly Sensitive Person Scale (HSPS; Aron & Aron, 1997) was used, with higher scores reflecting higher SPS. To assess Social Anxiety Tendencies (SAT), the Social Anxiety Questionnaire for Adults (SAQ-A30; Caballo et al., 2010) 30-item, 5-point measure was used, where higher scores identified higher SAT. Both measures have established reliability in past studies. Data were collected in a paper format after informed consent and ethical approval were established. Additionally, anonymity/confidentiality was provided to all participants. Data were then analyzed using IBM SPSS (version 27) and included descriptive statistics, Pearson correlation, and linear regression. Cronbach's alpha was used to analyze internal consistency of the scales.

RESULTS

In Table 1, the descriptive statistics and internal consistency for the primary variables are shown. The Sensory Processing Sensitivity (SPS) and Social Anxiety Tendencies (SAT) both demonstrated excellent internal reliability ($\alpha = .97$ for SPS; $\alpha = .95$ for SAT). The mean score for the Sensory Processing Sensitivity was 114.68, (SD = 35.48) with scores ranging from 37 to 178, and the mean for Social Anxiety Tendencies was 82.08 (SD = 22.44), ranging from 38 to 148. A distribution analysis revealed that Sensory Processing Sensitivity was approximately normally distributed (Skewness = -0.11) while Social Anxiety Tendencies had a moderate positive skewness (Skewness = 0.89), indicating that the sample may have skewed toward lower levels of social anxiety. Table 2 indicate reported a significant positive correlation between Sensory Processing Sensitivity and Social Anxiety Tendencies ($r = .240$, $p < .01$), which indicates participants with greater sensory sensitivity are more likely to report greater levels of social anxiety tendencies. In order to further investigate if there may be a relationship, a multiple linear regression analysis was conducted. The overall model was significant, $F(2, 297) = 9.33$, $p < .001$, and accounted for approximately 5.9% of the variance in social anxiety tendencies ($R^2 = .059$, $\text{adj } R^2 = .053$) Sensory Processing Sensitivity was significant predictor of Social Anxiety Tendencies ($B = 0.14$, $\beta = .23$, $t = 3.78$, $p < .001$), with a 95% confidence interval (CI) of 0.07 to 0.22 supporting the robustness of the findings. These results indicate that adults who have higher levels of sensory processing sensitivity have meaningfully greater symptoms of social anxiety. In fact, Sensory Processing Sensitivity was a significant predictor of Social Anxiety Tendencies ($\beta = .23$, $p < .001$) and explained approximately 5.9% of the variance, suggesting that individuals with higher levels of sensory sensitivity are at an increased likelihood of getting social anxiety symptoms.

Table 1

Descriptive Statistics of Key Study Variables (N = 300)

Variables	N	α	M	SD	Range		Skewness	Kurtosis
					Actual	Potential		
SPS	300	.97	114.68	35.48	37-178	27-189	-.11	-.97
SAT	300	.95	82.08	22.44	38-148	20-150	.89	.68

Note. SPS = Sensory Processing Sensitivity (measured by the Highly Sensitive Person Scale); SAT = Social Anxiety Tendencies (measured by the Social Anxiety Questionnaire for Adults SAQ-A30).

Table 2

Bivariate correlations among primary study variables (N = 300)

Variables	SPS	SAT
SPS	-	.240**
SAT		-

Note. SPS = Sensory Processing Sensitivity; SAT = Social Anxiety Tendencies. $p < .01$.

Table 3

Regression Summary for Social Anxiety Tendencies based on Sensory Processing Sensitivity (N = 300)

Predictor	B	SE	β	T	P	95% CI	
						LL	UL
Constant	63.74	4.50	-	14.16	.000	54.87	72.60
SPS	0.14	0.04	.23	3.78	.000	0.07	0.22

Note. SPS = Sensory Processing Sensitivity. B = unstandardized coefficient; β = standardized coefficient; SE = standard error; CI = confidence interval. outcome variable: Social Anxiety Tendencies.

DISCUSSION

The current investigation examined the potential relationship between Sensory Processing Sensitivity and Social Anxiety Tendencies in adults. Results were consistent with the hypothesis and revealed a significant positive correlation between Sensory Processing Sensitivity and Social Anxiety Tendencies, which means those who are more sensitive to sensory input are likely to also display symptoms of greater social anxiety. Results are also consistent with literature suggesting people who are high-SPS tend to experience overstimulation and carry greater emotional overload in social situations, subsequently resulting in avoidant behavior and increase self-awareness (Aron & Aron, 1997). Regression analyses also established Sensory Processing Sensitivity is a significant predictor of Social Anxiety Tendencies in adults, which indicates, when controlling for other potential sources of variance in the data, that adults who are high-SPS are more likely to exhibit the stated symptoms. regarding social anxiety, suggesting, that SPS is an inherent risk factor, when the individual is faced with situational stressors. These results begin to verify the Joint Vulnerability Model, which argues that inherent traits—such as high-SPS traits—culturally position an individual for psychological suffering (anxiety) as a response to strains arising from social interaction. Practically, these results suggest that sensory sensitivity should be considered separately; this is an additional consideration, but all three measures of sensory sensitivity showed statistically significant relationships with social anxiety in a culturally relevant model. Adults who

reported high levels of Sensory Processing Sensitivity, should be better supported through individual interventions aimed toward emotional self-regulation, interventions to manage stress levels, and interventions to promote desensitization. This research adds to the existing literature regarding temperament-based vulnerabilities, and tested in the non-western context of Pakistan, and in a context that has not reported studies on various dimensions of temperament and psychology, including social anxiety. Limitations are the reliance on self-report measures and the cross-sectional methodology constraining the inferences of causality. While, the sample was mostly comprised of young, educated adults which limits the generalizability of the findings to the rest of society. Allowing for larger and more diverse samples to study these relationships in future research, and that potential moderators should also be explored (i.e. gender, coping strategies, social supports).

CONCLUSION

This study provides evidence that Sensory Processing Sensitivity is significantly and positively correlated with Social Anxiety Tendencies in adults. Adults who score high on sensory sensitivity to various stimuli, like bright lights, loud noises, and crowds, tend to report greater social discomfort, fear of negative evaluation, and engage in behavior to avoid problem social situations entirely. Also, this provides support for categorizing biological temperament variables, like Sensory Processing Sensitivity, as potential vulnerabilities to symptoms of social anxiety. There would also be significant implications for mental health professionals, educators, and even policy makers, to consider in the fields of mental health and education regarding the findings of this study. For example, if clinicians are to take a step back, and consider that sensory sensitivity is a form of biological temperament, it would be beneficial to assess socially anxious clients' sensory sensitivity to take a more holistic approach for assessment and treatment. Identifying targeted interventions for individuals with elevated Sensory Processing Sensitivity (i.e. mindfulness-based, sensory modulation, cognitive-behavioral) is likely to improve social functioning and emotion regulation. Finally, implications for future research can be drawn from this study - longitudinal research is needed (and observing Sense of Development) on the previously noted Socioemotional - Sensory Processing Sensitivity relationship to determine if causation exists, and to aid in determining how environmental or psychological moderators (concepts such as, resilience, parenting, and emotion regulation styles) are impacting this relationship. This type of knowledge would provide therapeutically relevant explanations of how biological sensitivity for distress for some individuals will contextually interact with life experiences, affect mental health, and provide information for preventative or therapeutic frameworks for individuals with heightened sensitivity for risks.

IMPLICATIONS

Theoretical Implications

1. These results provide corroboration for the Joint Vulnerability Model indicating that individuals with elevated Sensory Processing Sensitivity are more susceptible of developing Social Anxiety Tendencies in challenging contexts.
2. These findings provide additional support for the conceptualization of SPS as a core temperamental disposition that predisposes individuals to anxiety, and it continues to support a significant association of SPS with anxiety-related outcomes.
3. By specifically exploring the relationship between SPS and SAT, the current study provides support for a biopsychosocial model of anxiety, in the hopes of encouraging researchers to investigate anxiety constructs by integrating both biological traits and psychosocial factors.

Practical Implications

1. Clinicians have to bear in mind sensory processing sensitivity while assessing customers with social tension tendencies, as fairly sensitive humans may moreover gain from tailored interventions collectively with mindfulness training, emotional regulation strategies, and graded exposure.
2. Awareness of the connection amongst Sensory Processing Sensitivity and social anxiety can guide educators, families, and highbrow health professionals in presenting supportive and low-stimulation environments, reducing the possibility of hysteria development.
3. Institutions can practice those findings to expand guidelines and inclusive practices that accommodate people with excessive sensory sensitivity, thereby enhancing their social functioning and emotional well-being.

LIMITATIONS

1. The pattern turned into decided on the usage of comfort sampling and consisted specifically of Pakistani college students, which limits the generalizability of the findings. Future research have to goal to encompass members from numerous age groups, academic backgrounds, and areas to enhance outside validity.
2. The take a look at hired a cross-sectional, correlational design, limiting the cappotential to set up causal inferences. While institutions have been discovered among SPS and SAT, the directionality of those relationships is unknown. Future studies have to use longitudinal designs to recognize extrade over the years and make clear causal pathways.
3. All the records have been received thru self-document questionnaires which may be situation to capacity biases (e.g., social desirability and recall), so in addition studies highlighting a multi-approach technique that still integrates medical interviews or behavioral statement can be useful in enhancing reliability.
4. While established contraptions had been hired on this have a look at, the mixing of qualitative information might permit for a greater complete illustration of the reviews of surprisingly touchy individuals. Future studies can also additionally include qualitative methodologies to offer more perception into the contributions of SPS to social tension tendencies.
5. Studies gathering longitudinal records ought to be performed to have a look at the way wherein SPS units the level and unfolds throughout specific lifestyles intervals with reference to social tension.
6. Experimental research ought to be performed to evaluate whether or not tons of the literature on mindfulness, schooling in emotional regulation, or cognitive-conduct techniques reveal a few efficacies with decreasing social tension signs in human beings with excessive SPS.
7. Future research need to look at feasible moderators including gender, resilience, and cultural norms to apprehend how SPS interprets into one-of-a-kind styles of social tension throughout distinctive populations.
8. Protective elements together with social support, steady attachment, and high quality peer relationships must be tested as well, as they will function a buffer in opposition to social tension for people with excessive sensitivity to environmental stimuli.

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