Impact of Sensory Processing Sensitivity on Emotional Dysregulation in Gifted Students: The Mediating Role of Anxiety Sensitivity

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Article type: *Original Research* **How to cite this article:** Abedi, A., & Nejatifar, S. (2025). Impact of Sensory Processing Sensitivity on Emotional Dysregulation in Gifted Students: The Mediating Role of Anxiety Sensitivity. *Psychological Research in Individuals with Exceptional Needs, 3*(3), 1-9. https://doi.org/10.61838/kman.prien.3.3.2 © 2025 the authors. Published by KMAN Publication Inc. (KMANPUB), Ontario, Canada. This is an open access article under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.	This study aimed to investigate the impact of sensory processing sensitivity on emotional dysregulation in gifted students, examining the mediating role of anxiety sensitivity in this relationship. The research employed a descriptive correlational design, involving a sample of 390 gifted secondary school students from Nigeria, selected based on Morgan and Krejcie's sampling table. Participants completed three validated Likert-based instruments: the Highly Sensitive Person Scale (HSPS), the Anxiety Sensitivity Index-3 (ASI-3), and the Difficulties in Emotion Regulation Scale (DERS). Data analysis was conducted using SPSS-27 for descriptive statistics and Pearson correlation analysis, and AMOS-21 for structural equation modeling (SEM) to assess direct, indirect, and total effects among the variables. Model fit was evaluated using standard indices including RMSEA, CFI, TLI, and GFI. Pearson correlation coefficients indicated significant positive relationships between sensory processing sensitivity, anxiety sensitivity, and emotional dysregulation ($r = .56$ to $.67$, $p < .001$). The SEM results showed that sensory processing sensitivity had a significant direct effect on emotional dysregulation ($\beta = .42$, $p < .001$), and on anxiety sensitivity ($\beta = .56$, $p < .001$). Anxiety sensitivity also directly predicted emotional dysregulation ($\beta = .49$, $p < .001$). Importantly, anxiety sensitivity partially mediated the relationship between sensory processing sensitivity and emotional dysregulation, with a significant indirect effect ($\beta = .28$, $p < .001$). The model demonstrated excellent fit indices (CFI = .96, RMSEA = .052, $\chi^2/df = 2.07$). The findings underscore the importance of recognizing and addressing anxiety sensitivity as a key psychological mechanism linking sensory traits and emotional dysregulation in gifted youth. Interventions that integrate emotional regulation and sensitivity awareness may enhance educational and psychological outcomes for this population. ***Keywords:*** *Gifted students; sensory processing sensitivity; emotional dysregulation; anxiety sensitivity; structural equation modeling.*

1. Introduction

Gifted students, often characterized by exceptional cognitive, academic, or creative abilities, are typically perceived as resilient and self-regulated learners. However, this assumption overlooks the complex emotional and sensory profiles that frequently accompany high cognitive potential. Emotional dysregulation—defined as difficulties in managing, processing, or expressing emotions appropriately—has emerged as a pressing concern among gifted youth, particularly when compounded by traits such as sensory processing sensitivity (SPS) and anxiety sensitivity. These internal dispositions can place gifted students at heightened risk for emotional maladjustment, calling for a nuanced understanding of their developmental profiles in educational and psychological contexts (Muneera et al., 2023; Rhaissa Andrêssa Ramos de & Fleith, 2021).

Sensory processing sensitivity (SPS) is a temperament trait that describes heightened sensitivity to both internal and external stimuli. It is notably prevalent among gifted students, many of whom report deep cognitive processing, high emotional reactivity, and sensitivity to environmental subtleties (Bonte et al., 2024; Michalak, 2022). While these characteristics can foster profound creativity and empathy, they may also predispose individuals to overwhelm and stress. In educational settings, such sensitivities can manifest in behavioral withdrawal, emotional volatility, or aversion to overstimulation—all of which may impede learning and social integration (Gabrijelčič & Seničar, 2024; Güler & Ulusoy, 2025). When SPS is coupled with anxiety sensitivity—defined as the fear of anxiety-related sensations—it can result in an overinterpretation of benign stimuli as threatening, exacerbating emotional dysregulation (Rhaissa Andrêssa Ramos de & Fleith, 2021; Shin, 2022).

The phenomenon of emotional dysregulation in gifted students is further complicated by misinterpretations within educational systems. Teachers and school staff may mistake emotional outbursts, perfectionism, or withdrawal for behavioral problems or developmental disorders (Akgül, 2021; GİRgİN et al., 2023). These misconceptions can lead to inappropriate interventions or a lack of support altogether. As Bardzińska (2024) notes, gendered perceptions of giftedness may also bias how emotional expressions are interpreted and managed, with girls' sensitivities often overlooked and boys' emotional reactivity pathologized (Bardzińska, 2024). Consequently, many gifted learners remain underserved, particularly when their emotional and sensory sensitivities are not explicitly recognized in identification or intervention processes (Braslauskienė et al., 2023; Thomas & Mascharka, 2023).

Research indicates that SPS is more than a sensory characteristic; it is deeply intertwined with affective regulation and stress response systems. Highly sensitive individuals tend to engage in deeper information processing, which, while cognitively beneficial, can be emotionally burdensome when facing criticism, unpredictability, or interpersonal conflict (Bonte et al., 2024; Gabrijelčič & Seničar, 2024). In the case of gifted students, this intensification of emotional and sensory stimuli often leads to overexcitabilities—heightened psychological responses to environmental or internal cues—which are recognized as both assets and vulnerabilities in gifted profiles (Muneera et al., 2023; Oh, 2024). Overexcitabilities in the emotional and sensory domains, in particular, have been found to predict increased internalizing symptoms, including anxiety and mood disturbances, as well as difficulties with emotional regulation (Rhaissa Andrêssa Ramos de & Fleith, 2021; Smith & Wood, 2020).

Anxiety sensitivity, distinct from general anxiety, refers to an individual's fear of the physical, cognitive, and social consequences of experiencing anxiety. For gifted students who are already processing the world in heightened ways, anxiety sensitivity can serve as a mediating mechanism between sensory sensitivity and emotional dysfunction. The anticipatory fear of emotional arousal may lead such students to avoid risk, overcontrol their behaviors, or become overly perfectionistic, further exacerbating emotional dysregulation (KuŞCİ & ÇElİK, 2022; Shaidenko et al., 2021). Additionally, anxiety sensitivity can amplify physiological feedback loops, causing a heightened fear response even in non-threatening contexts, which may disrupt the student's academic and social engagement (GİRgİN et al., 2023; Smith & Wood, 2020).

Despite the documented interplay between sensory processing, anxiety, and emotional functioning, few empirical studies have directly examined these variables in gifted populations through a mediational lens. This gap is particularly evident in underrepresented or non-Western educational settings, where cultural factors may influence the recognition and support of giftedness (Kuehl et al., 2025; Zakaria et al., 2023). For instance, in many African and Middle Eastern contexts, giftedness is often narrowly defined by academic performance, with limited attention paid to emotional or sensory characteristics (Hemingway, 2023; Michalak, 2022). This neglect may result in the systemic overlooking of gifted students who exhibit

emotional dysregulation or heightened sensitivity, ultimately reducing their access to appropriate psychological or educational interventions (Güler & Ulusoy, 2025; Yildiz & Durmaz, 2021).

Furthermore, educational practices and teacher perceptions significantly shape the experiences of gifted students with emotional and sensory sensitivities. Teachers' beliefs about giftedness, their expectations, and their training backgrounds directly influence how they interpret and respond to students' emotional needs (Akgül, 2021; Braslauskienė et al., 2023). As noted by Shin (2022), pre-service teachers often lack preparation in science-based or emotional development models for gifted students, leading to gaps in effective pedagogical strategies. Similarly, GİRgİN et al. (2023) highlight the inadequate training many educators receive in identifying twice-exceptionality, which often includes emotional and sensory processing difficulties as underlying components (Bonte et al., 2024; GİRgİN et al., 2023). Addressing this requires integrating affective education into the curriculum and enhancing teachers' emotional literacy to support complex learner profiles.

The role of individualized education plans (IEPs) and differentiated learning environments is also crucial in mitigating the impact of SPS and anxiety sensitivity on emotional dysregulation. Gabrijelčič and Seničar (2024) emphasize the importance of engaging gifted students actively in the preparation of personalized plans that address both their strengths and vulnerabilities (Gabrijelčič & Seničar, 2024). This collaborative approach not only empowers students but also fosters self-awareness and emotional competence. Likewise, Thomas and Mascharka (2023) argue for the use of student profiles and process-based assessments to identify nuanced patterns of learning and emotional functioning, which can guide more responsive teaching strategies (Oh, 2024; Thomas & Mascharka, 2023).

The current study seeks to address these multidimensional gaps by empirically testing a structural model that explores the mediating role of anxiety sensitivity in the relationship between sensory processing sensitivity and emotional dysregulation in gifted students.

2.   Methods and Materials

2.1.   Study Design and Participants

This research employed a descriptive correlational design to investigate the impact of sensory processing sensitivity on emotional dysregulation in gifted students, with anxiety sensitivity as a mediating variable. The study population consisted of gifted secondary school students from urban and peri-urban regions in Nigeria. Based on the Morgan and Krejcie (1970) sample size determination table, a sample of 390 participants was deemed sufficient to represent the target population with a confidence level of 95%. Participants were selected using stratified random sampling to ensure diversity in age, gender, and educational background. Informed consent was obtained from all participants.

2.2.   Measures

To assess emotional dysregulation in gifted students, the Difficulties in Emotion Regulation Scale (DERS) developed by Gratz and Roemer (2004) was utilized. This self-report instrument consists of 36 items rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), designed to measure six dimensions of emotional regulation difficulties: Nonacceptance of emotional responses, Difficulties engaging in goal-directed behavior, Impulse control difficulties, Lack of emotional awareness, Limited access to emotion regulation strategies, and Lack of emotional clarity. Higher scores reflect greater difficulties in emotional regulation. The DERS has been widely validated across adolescent and adult populations, with robust psychometric properties reported in multiple studies, including high internal consistency (Cronbach's alpha = .93) and confirmed construct validity through factor analysis.

Anxiety sensitivity was measured using the Anxiety Sensitivity Index-3 (ASI-3), a revised version of the original ASI developed by Taylor et al. (2007). This 18-item self-report scale is rated on a 5-point Likert scale from 0 (very little) to 4 (very much) and evaluates individuals' fear of anxiety-related sensations. The ASI-3 encompasses three subscales: Physical Concerns (e.g., fear of somatic symptoms), Cognitive Concerns (e.g., fear of losing mental control), and Social Concerns (e.g., fear of visible anxiety symptoms in public). Each subscale comprises six items. The ASI-3 demonstrates excellent internal consistency (α = .86–.91 across subscales) and strong convergent and discriminant validity across both clinical and non-clinical samples, as shown in various cross-cultural validation studies.

Sensory processing sensitivity was assessed using the Highly Sensitive Person Scale (HSPS), developed by Aron and Aron (1997). This widely used 27-item self-report instrument is scored on a 7-point Likert scale ranging from

1 (not at all true) to 7 (extremely true), and is designed to identify individuals with heightened sensitivity to environmental and emotional stimuli. The HSPS comprises three primary subscales: Ease of Excitation (e.g., being easily overwhelmed by stimuli), Aesthetic Sensitivity (e.g., responsiveness to art or beauty), and Low Sensory Threshold (e.g., sensitivity to bright lights or loud noises). The HSPS has been shown to possess good internal consistency (overall Cronbach's alpha ≈ .85) and strong construct and criterion validity, as supported by confirmatory factor analyses in both adolescent and adult populations.

2.3. Data Analysis

Data were analyzed using SPSS version 27 and AMOS version 21. Descriptive statistics including means, standard deviations, frequencies, and percentages were computed to summarize demographic variables and study constructs. Pearson correlation coefficients were calculated to explore the bivariate relationships between the dependent variable (emotional dysregulation) and the independent variables (sensory processing sensitivity and anxiety sensitivity). To test the hypothesized mediation model, Structural Equation Modeling (SEM) was conducted using AMOS, enabling the simultaneous assessment of direct and indirect effects among variables. Model fit indices such as Chi-square (χ^2), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) were used to evaluate model adequacy.

3. Findings and Results

The final sample consisted of 390 gifted students, including 207 females (53.08%) and 183 males (46.92%). Participants' ages ranged from 13 to 18 years, with the majority aged between 15 and 16 years (n = 145, 37.18%), followed by those aged 17 to 18 years (n = 128, 32.82%) and 13 to 14 years (n = 117, 30.00%). Regarding school location, 224 students (57.44%) attended urban schools, while 166 students (42.56%) were enrolled in peri-urban institutions. All participants were identified as gifted based on school-administered cognitive and creative aptitude assessments.

Table 1

Descriptive Statistics for Study Variables (N = 390)

Variable	Mean (M)	Standard Deviation (SD)
Sensory Processing Sensitivity	4.82	0.63
Anxiety Sensitivity	3.91	0.58
Emotional Dysregulation	3.78	0.71

The descriptive statistics presented in Table 1 show that gifted students reported relatively high levels of sensory processing sensitivity (M = 4.82, SD = 0.63) and moderate-to-high levels of anxiety sensitivity (M = 3.91, SD = 0.58). Emotional dysregulation was also reported at a moderate level (M = 3.78, SD = 0.71), suggesting variability in students' emotional regulation capacities.

Prior to conducting parametric analyses, statistical assumptions were evaluated and confirmed. The normality assumption was assessed using skewness and kurtosis values, which ranged from −0.84 to 0.71 and −0.92 to 1.13 respectively, all within the acceptable range of ±2. Linearity was examined through scatterplots, which indicated consistent linear relationships between independent and dependent variables. Multicollinearity was assessed using Variance Inflation Factors (VIF), which ranged from 1.12 to 1.39, well below the threshold of 5. Additionally, homoscedasticity was verified by inspecting residual plots, which showed evenly distributed residuals without funneling or curvature. These findings confirmed the data met the assumptions for Pearson correlation and SEM analysis.

Table 2

Pearson Correlation Coefficients Among Study Variables

Variable	1	2	3
1. Sensory Processing Sensitivity	—		
2. Anxiety Sensitivity	.56** (p < .001)	—	
3. Emotional Dysregulation	.62** (p < .001)	.67** (p < .001)	—

As shown in Table 2, sensory processing sensitivity was positively and significantly correlated with both anxiety sensitivity (r = .56, p < .001) and emotional dysregulation (r = .62, p < .001). Anxiety sensitivity also had a strong positive correlation with emotional dysregulation (r = .67, p < .001). These correlations support the hypothesized direct and indirect relationships among the variables.

Table 3

Goodness-of-Fit Indices for the Structural Equation Model

Fit Index	Value	Recommended Threshold
Chi-Square (χ^2)	128.43	—
Degrees of Freedom (df)	62	—
χ^2/df	2.07	< 3
GFI	0.95	≥ 0.90
AGFI	0.91	≥ 0.90
CFI	0.96	≥ 0.90
RMSEA	0.052	< 0.08
TLI	0.94	≥ 0.90

The structural model demonstrated excellent fit to the data, as shown in Table 3. The χ^2/df ratio was 2.07, indicating acceptable model parsimony. Fit indices including GFI (.95), AGFI (.91), CFI (.96), and TLI (.94) all exceeded recommended thresholds, while RMSEA (.052) was well within the acceptable range. These values confirm the model's adequacy in explaining the relationships among the study variables.

Table 4

*Standardized and Unstandardized Path Coefficients (Direct, Indirect, and Total)*

Path	b	S.E.	β	p
SPS → Anxiety Sensitivity (Direct)	0.48	0.07	.56	<.001
SPS → Emotional Dysregulation (Direct)	0.36	0.06	.42	<.001
Anxiety Sensitivity → Emotional Dysreg. (Direct)	0.44	0.05	.49	<.001
SPS → Emotional Dysregulation (Indirect via AS)	0.21	—	.28	<.001
SPS → Emotional Dysregulation (Total)	0.57	—	.70	<.001

Table 4 displays the structural path coefficients. Sensory processing sensitivity significantly predicted anxiety sensitivity (b = 0.48, β = .56, p < .001), and both SPS and anxiety sensitivity directly predicted emotional dysregulation (b = 0.36 and 0.44 respectively, both p < .001).

The indirect effect of SPS on emotional dysregulation via anxiety sensitivity was also significant (b = 0.21, β = .28), supporting the mediating role of anxiety sensitivity. The total effect of SPS on emotional dysregulation (β = .70) was substantial.

Figure 1

Structural Model of The Study

Structural Model of SPS, AS, and Emotional Dysregulation
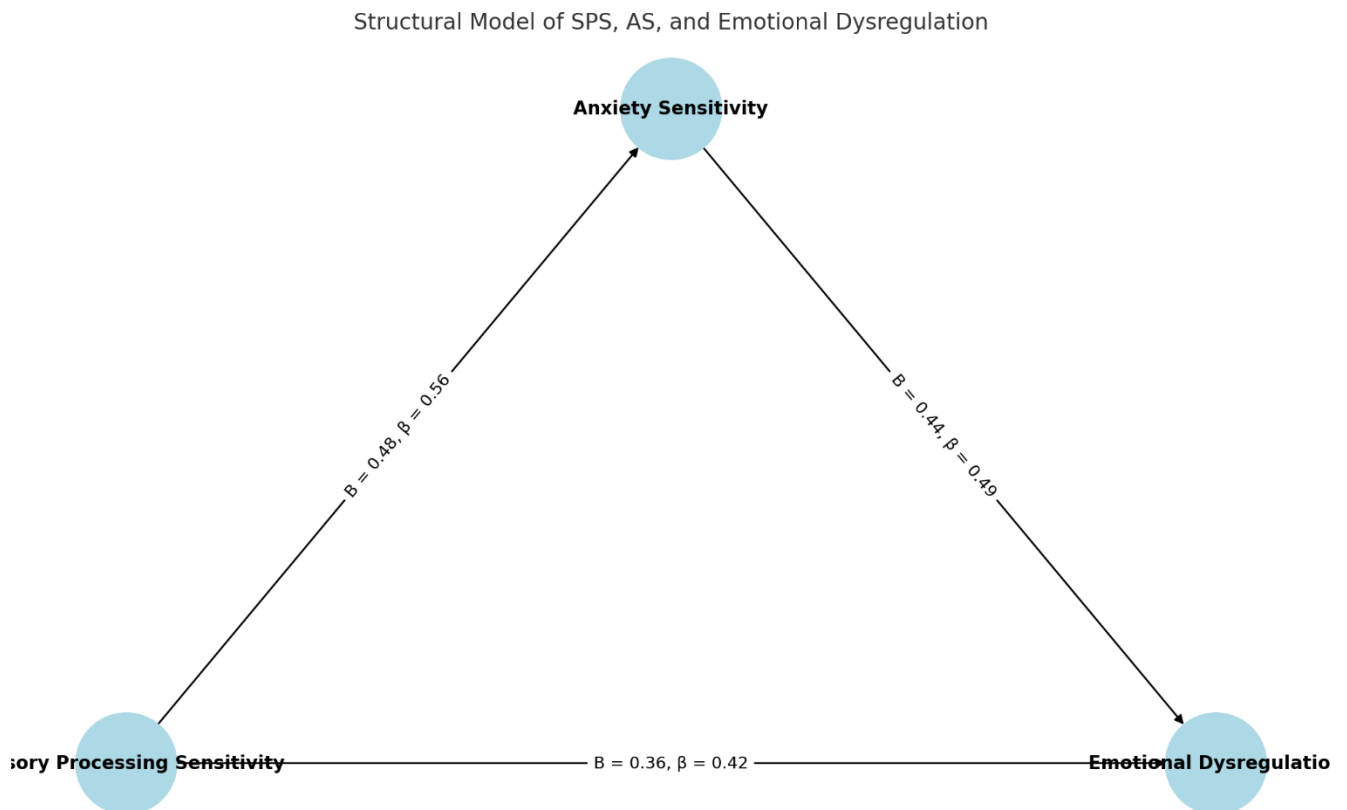
4. Discussion and Conclusion

The results of this study confirmed a significant direct relationship between sensory processing sensitivity (SPS) and emotional dysregulation among gifted students. Additionally, anxiety sensitivity was found to partially mediate this relationship, suggesting that heightened awareness and fear of anxiety-related sensations can exacerbate the effect of sensory sensitivity on emotional instability. This finding supports the proposed model and deepens the understanding of the emotional functioning of gifted learners by identifying specific internal mechanisms that contribute to their vulnerability to dysregulation.

The observed direct relationship between SPS and emotional dysregulation aligns with prior literature emphasizing the heightened sensitivity of gifted students to environmental and emotional stimuli (Bonte et al., 2024; Gabrijelčič & Seničar, 2024). As previous studies have indicated, individuals with high SPS often engage in deeper cognitive and emotional processing, making them more responsive to both positive and negative environmental cues (Michalak, 2022; Muneera et al., 2023). However, this heightened responsiveness often overwhelms the individual's emotion regulation capacity, especially when stimuli are rapid, loud, or intense. In this context, gifted students who are highly sensitive may experience overstimulation in busy classroom settings or during emotionally demanding academic tasks, ultimately leading to emotional dysregulation (Güler & Ulusoy, 2025; Shin, 2022).

This study's finding that anxiety sensitivity mediates the relationship between SPS and emotional dysregulation provides new insight into how gifted students internalize and respond to their heightened experiences. Students with high anxiety sensitivity tend to fear not just external events but also their own internal anxiety symptoms, such as increased heart rate, tension, or intrusive thoughts. This fear can create a self-reinforcing feedback loop where the student becomes more emotionally reactive to their reactions, heightening their emotional instability (KuŞCİ & ÇElİK, 2022; Smith & Wood, 2020). In the context of SPS, this means that the student is not only overwhelmed by the sensory aspects of the environment but is also frightened by their own stress reactions, which compounds dysregulation.

The mediating effect observed in this study mirrors the findings of prior investigations into the psychological functioning of highly sensitive gifted learners. For example, (Rhaissa Andrêssa Ramos de & Fleith, 2021) found that emotional and somatic overexcitabilities were significantly related to negative affectivity and internalizing behaviors in gifted adolescents. Similarly, (Muneera et al., 2023) concluded that overexcitabilities predicted key traits of creative but emotionally unstable students, such as emotional lability and fear of failure. These findings suggest that emotional volatility in gifted individuals is not solely a function of external pressures or cognitive load but is also shaped by their biological and emotional sensitivity traits.

Moreover, the structural equation modeling in this study revealed strong model fit indices, confirming the robustness of the proposed mediating model. This reinforces arguments in the literature that emotional and anxiety sensitivities should be central to any psychological model of giftedness, rather than peripheral concerns (Bonte et al., 2024; Shaidenko et al., 2021). Importantly, this model also highlights the need for early identification and targeted emotional support interventions in gifted populations. Gifted education, particularly in non-Western contexts like Nigeria, often emphasizes cognitive performance while neglecting socio-emotional development (Kuehl et al., 2025; Zakaria et al., 2023). As a result, many students who present high potential may simultaneously struggle with emotion regulation, but go unrecognized because their difficulties are viewed as unrelated to giftedness (Akgül, 2021; Bardzińska, 2024).

In line with this, the findings of the current study provide empirical support for the claims made by (Thomas & Mascharka, 2023) and (Gabrijelčič & Seničar, 2024), who advocate for individualized educational programs that account not only for academic ability but also emotional and behavioral profiles. If a gifted learner exhibits SPS and high anxiety sensitivity, traditional approaches to enrichment may not be effective—or could even be harmful—if not accompanied by emotional support strategies. This concern has been raised by (Braslauskienė et al., 2023) in her cross-cultural study, where teachers from Lithuania and Ukraine expressed difficulty supporting gifted students with emotional complexity, particularly in rigid academic systems.

Furthermore, this study affirms that teacher perceptions and beliefs play a central role in identifying and responding to emotional dysregulation in gifted students. As (GİRgİN et al., 2023) notes, many teachers express a lack of training in recognizing emotional or sensory sensitivity in their students, often mislabeling such characteristics as behavioral issues. This aligns with (Bardzińska, 2024), who found that female and male teachers interpreted emotional reactivity in gifted students differently, potentially reinforcing gendered biases in classroom behavior assessments. The risk is that students with high SPS and anxiety sensitivity may be misunderstood and subsequently marginalized from gifted programs or social groups, worsening their emotional self-concept.

Another layer of interpretation relates to cultural contexts. In countries like Nigeria, where gifted education is emerging within rigid national curricula, emotional well-being is rarely incorporated into formal talent development frameworks. (Kuehl et al., 2025) and (Zakaria et al., 2023) both note that in rural or faith-based contexts, identification of giftedness is often limited to academic or religious performance (e.g., Quran memorization), while traits like emotional or sensory sensitivity are either ignored or culturally reframed as misbehavior. This could prevent appropriate support and interventions from reaching students with high SPS and anxiety sensitivity, who may otherwise benefit from tailored socio-emotional learning initiatives.

The current results also intersect with recent studies on differentiated instruction and process-based assessment. For example, (Oh, 2024) found that using dynamic, digital tools to assess mathematical thinking in gifted students helped reveal hidden anxieties and motivational profiles that traditional assessments missed. Similarly, (Yildiz & Durmaz, 2021) demonstrated that a student's ability to generalize mathematical patterns was influenced not just by cognitive skill but by how emotionally supported they felt in the learning environment. These studies echo the importance of considering emotional variables in the design of gifted curricula.

Finally, the findings lend support to evolving models of teacher training and development, especially for those working with twice-exceptional learners. As (Shin, 2022) argued, pre-service training often lacks adequate content on emotional support for gifted students. The absence of this knowledge leaves educators ill-equipped to address the emotional dysregulation triggered by high SPS and anxiety sensitivity. Future efforts to develop gifted education should integrate evidence-based frameworks that train educators to observe, identify, and accommodate emotional variability.

Despite the strength of its findings, this study has several limitations. First, the use of self-report instruments

introduces the potential for response bias, especially among adolescents who may lack insight into their own emotional patterns or may respond in socially desirable ways. Second, the cross-sectional design limits causal inference; while structural equation modeling suggests directional relationships, longitudinal research is needed to confirm the developmental trajectory of SPS and anxiety sensitivity over time. Third, the cultural context—focused solely on gifted students in Nigeria—may limit the generalizability of findings to other sociocultural environments with different definitions or perceptions of giftedness. Lastly, while the sample size was sufficient, it did not allow for subgroup analysis by gender, age, or type of giftedness (e.g., academic vs. artistic), which could reveal additional nuances in the data.

Future research should employ longitudinal or experimental designs to examine how interventions targeting anxiety sensitivity can buffer the effects of SPS on emotional dysregulation in gifted populations. Such studies could explore the role of mindfulness, biofeedback, or resilience training in reducing overreactivity. Additionally, research should examine how cultural, religious, and educational values shape the expression and recognition of sensory and emotional traits in gifted students, particularly in underrepresented regions such as sub-Saharan Africa, the Middle East, and Southeast Asia. Including parent, teacher, and peer reports may also provide a more multi-dimensional view of students' functioning. Future work could also investigate the neural and physiological correlates of SPS and anxiety sensitivity to deepen understanding of the biopsychosocial basis of emotional dysregulation.

Educational practitioners, school psychologists, and gifted education specialists should be trained to recognize sensory and anxiety sensitivities as integral—not incidental—components of the gifted experience. Screening for SPS and anxiety sensitivity should become a routine part of gifted identification processes. Schools should implement socio-emotional learning (SEL) curricula specifically tailored for gifted students, emphasizing emotional regulation, coping strategies, and peer support. Classroom environments should be designed to minimize overstimulation and provide spaces for self-regulation. Individualized educational plans should integrate emotional as well as cognitive goals. By adopting a holistic approach to giftedness, educational systems can create inclusive spaces that support the full range of gifted learners' needs.

Authors' Contributions

Authors contributed equally to this article.

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