# EXPLAINING THE RELATIONSHIP BETWEEN SENSORY PROCESSING SENSITIVITY AND ALEXITHYMIA THROUGH ATTACHMENT STYLES

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### Abstract

High Sensory Processing Sensitivity (HSPS) affects around 30% of people (Lionetti et al., 2018). It involves an increased reactivity to environmental stimuli. HSPS increases alexithymia (Bordarie et al., 2024) which corresponds to difficulties in identifying and describing emotions (Sifneos, 1995). Both contribute to an increase in psychopathological symptoms such as stress, anxiety and depressive symptoms (e.g., (Radetzki et al., 2021). This is particularly true during adolescence, a transformative period that makes individuals more vulnerable to mental health problems (Essau & De La Torre-Luque, 2019) and during which the social environment has a significant impact (Bathelt et al., 2021). For example, attachment styles - secure, preoccupied, dismissive or fearful - influence the ability to interpret and respond to emotional and social cues throughout life (Wilkinson & Walford, 2001). We tested two hypotheses: (1) HSPS will negatively influence both alexithymia and attachment styles; and (2) secure and fearful attachment styles will mediate the relationship between HSPS and alexithymia. The sample (n=148) consisted of 75.68% females (n=112) and 24.32% males (n=36) aged between 15 and 25 years. The mean age was 18.42 years old (SD=3.01). Regarding their status, 60.14% (n=89) were in high school, 29.05% (n=43) were in university and 10.81% (n=16) had a job. They anonymously completed an online questionnaire assessing high sensory processing sensitivity (HSPS-FR), alexithymia (TAS-20) and attachment styles (RSQ). Statistical analyses including correlations, linear regressions, and mediation models were performed with JASP (version 0.19.3) and Jamovi (version 2.6.17.0). Results showed that HSPS influenced fearful attachment style ( $\beta$ =.3400; p<.001) and secure attachment style ( $\beta$ =-.2396; p=.003) but not alexithymia which was influenced by fearful ( $\beta$ =.2891; p<.001) and secure ( $\beta$ =-.2812; p<.001) attachment styles. Both mediate the relationship between HSPS and alexithymia. This study is not in line with the literature that reports the influence of HSPS on alexithymia (Jerome & Liss, 2005). However, we confirmed the vulnerabilising effect of HSPS on alexithymia through the negative impact of fearful attachment style and the protective effect of secure, which mitigates the negative impact of HSPS. The discussion will underscore the importance of fostering secure attachment and emotional regulation strategies during adolescence. Limitations will be mentioned, such as the cross-sectional design, which precludes causal inferences, and potential biases in alexithymia prevalence. Future research should examine longitudinal effects and the role of psychological resources and coping mechanisms.

**Keywords:** Sensory processing sensitivity, alexithymia, attachment styles, internalized disorders, adolescents.

## **1. Introduction**

Adolescence is a critical period of growth, characterised by significant physical, neurological, and psychological changes. It is not simply a transition from childhood to adulthood but a time of considerable individual variation, particularly in personality development and the emergence of inter-individual differences (Branje et al., 2007). Mental health challenges often emerge during this period, with half of all mental disorders appearing before the age of 14 (Patton et al., 2016). The social environment plays a key role in shaping adolescent development (Bathelt et al., 2021). Negative parental behaviours increase the risk of anxiety and depression (Houzel, 2003), whereas positive parenting and social support promote well-being. A supportive family environment acts as a buffer against mental health problems, and helps adolescents develop resilience, autonomy, and positive psychological development, which act as protective factors and promote coping strategies and a positive self-image (Masten & Palmer, 2019). Adolescence can be particularly challenging for individuals with high sensory processing sensitivity (HSPS), which is associated with increased sensitivity in the processing of social, and emotional stimuli (Aron et al., 2012). Approximately 30% of individuals report HSPS (Lionetti et al., 2018), and these individuals tend to respond more intensely to stimuli, both positive and negative (Boterberg & Warreyn, 2016). Although not a disorder, HSPS makes emotional regulation more difficult and increases internalised problems such as depression and anxiety in adolescents (Gearhart, 2014).

Emotional regulation, the ability to manage emotional responses, is particularly challenging for people with HSPS and is often associated with alexithymia, the difficulty in identifying and describing emotions (Preece et al., 2023). Alexithymia may be a stable personality trait or a response to stress that serves as a temporary coping mechanism (Conrad et al., 2009). The association between HSPS and alexithymia increases the risk of behavioural problems such as substance abuse, depression and anxiety (Radetzki et al., 2021). Attachment theory suggests that early relationships with caregivers influence emotional regulation and stress management (Bowlby, 1969). Adolescents with secure attachment styles may be better equipped to cope with HSPS and alexithymia, potentially buffering against socio-emotional difficulties (Wilkinson & Walford, 2001). Four attachment styles can be identified: secure, preoccupied, dismissive, and fearful. They are shaped by two basic cognitive frameworks: the model of self, which reflects an individual's sense of worthiness in relationships, and the model of others, which represents their expectations of the availability and responsiveness of others. Secure attachment arises from a positive view of both self and others, and fosters trust and emotional closeness. Preoccupied attachment is characterised by a negative self-perception but a positive view of others, leading to dependency and fear of abandonment. Dismissive attachment involves a positive self-view but a negative view of others, leading to emotional detachment and self-sufficiency. Fearful attachment results from negative views of both self and others, leading to ambivalence and difficulty forming stable relationships (Wearden et al., 2005).

# 2. Objectives and hypotheses

Highly sensitive adolescents with secure attachments may benefit from their caregivers' responsiveness, which facilitates emotional regulation in the face of stressors. In contrast, those with dismissive or fearful attachment styles may lack such protective factors, increasing their vulnerability to alexithymia. Insecure attachment, which often results from inconsistent or traumatic caregiving, may exacerbate the negative relationship between HSPS and alexithymia, potentially leading to more severe disorders. This study examines the impact of sensory processing sensitivity on alexithymia and attachment styles, focusing on the mediating role of attachment styles in the relationship between SPS and alexithymia. Two hypotheses were pursued:

- H1: HSPS will negatively influence both alexithymia and attachment styles.
- H2: Secure and fearful attachment styles will mediate the relationship between HSPS and alexithymia.

# 3. Method

### **3.1.** Participants

The sample consisted of 148 adolescents and young adults. We used a convenience sample with 74.66% females (n=112) and 24% males (n=36). The mean age was 18.31 years, ranging from 15 to 25 years, with 52.03% (n=77) in the 15-17 age group and 47.97% (n=71) in the 18-25 age group. Regarding their status, 60.14% (n=89) were in high school, 29.05% (n=43) were in university and 10.81% (n=16) had a job.

### 3.2. Procedure and recruitment

The study protocol was approved by the Ethics Committee for Research Involving the Human Person of the Universities of Tours and Poitiers (CER-TP) (approval number 2023-12-05). Participants were invited to complete an anonymous and confidential online questionnaire via the Sphinx platform. They were first informed of the aims of the study and gave their explicit consent. The estimated time to complete the questionnaire was 20 minutes. The questionnaire was open from 5 February to 31 March 2024, and the link was shared through social media discussion groups, secondary schools with administrative consent, and word of mouth.

#### 3.3. Measures

The questionnaire consisted of three questions related to socio-demographic characteristics were asked (gender, age, educational level) and three key variables: high sensory processing sensitivity,

alexithymia, and attachment style. Sensory processing sensitivity is assessed using the French version of the Highly Sensitive Person Scale (HSPS-FR) (Bordarie et al., 2022), a 27-item questionnaire that assesses cognitive and emotional responses to stimuli, with responses rated on a 7-point Likert scale. Alexithymia is measured by the 20-item Toronto Alexithymia Scale (TAS-20) (Bagby et al., 1994), where participants rate items on a 5-point Likert scale, and a score of 56 or higher indicates alexithymia (Loas et al., 1996). Attachment style is assessed using the French version of the Relationship Scales Questionnaire (RSQ) (Guédeney et al., 2010), which categorizes attachment into four styles – secure, preoccupied, dismissive, and fearful – based on a 5-point Likert scale. Attachment styles are also analysed according to the dual model: model of self and model of others.

### 3.4. Statistical analyses

The data were analysed using JASP (version 0.18.3). The internal reliability of the scales was measured using Cronbach's alpha; values are given for each scale [HSPS-FR:  $\alpha$ =.90; TAS-20:  $\alpha$ =.80; RSQ-secure:  $\alpha$ =.41; RSQ-preoccupied:  $\alpha$ =.22; RSQ-dismissive:  $\alpha$ =.64; and RSQ-fearful:  $\alpha$ =.54]. As not all variables follow a normal distribution, we generally used non-parametric tests. Descriptive analyses, Chi2 tests, Spearman's correlations, T-tests. Linear regressions and a mediation analysis were also performed with Jamovi (version 2.6.17.0).

## 4. Results

#### **4.1. Descriptive results**

According to the classification of Lionetti et al. (2018), 28.38% of participants (n=42) had low sensory processing sensitivity (SPS) scores (below 113), 35.13% (n=52) had moderate SPS scores (between 113 and 137), and 36.49% (n=54) had high SPS scores (above 137). Regarding alexithymia, 40.54% (n=60) scored below 56, while 59.46% (n=88) scored 56 or higher, indicating potential alexithymia. A Chi2 test revealed an overrepresentation of highly sensitive individuals within the alexithymia group (X2(2)=11.120; p=.004).

## 4.2. Influence of sociodemographic characteristics

The Chi2 test showed a significant difference between men and women (X2(2)=16.682; p<.001), with hyposensitive individuals overrepresented among men and highly sensitive individuals overrepresented among women. A significant gender difference was also found for alexithymia (X2(1)=8.351; p=.004), with alexithymia being more common among women. A significant difference was found according to status (high school, university or work) (X2(2)=6.567; p=.037), with alexithymia being more common among university students. Age had no effect on alexithymia or HSPS scores.

### **4.3.** Correlations, regressions and mediation

The results of the correlation analysis are shown in Table 1. Results of the multiple regression analysis indicated that HSPS did not significantly influence alexithymia (t=1.43, p=.156). However, HSPS positively influenced fearful (t=4.39; p<.001) and preoccupied attachment styles (t=5.18; p<.001) and negatively influenced secure attachment style (t=-3.02; p<.003). More generally, HSPS influenced the model of self (t=-5.69; p<.001) but not the model of others. The results of the mediation analysis (Figure 1) indicated a significant indirect effect (z=2.579, p=.01) between HSPS and alexithymia with the model of self as a mediator. Fearful (z=2.75; p=.006) and secure attachment styles (z=2.28; =.02) also showed a significant indirect effect.

Variables	1		2		3		4		5		6		7
1. TAS20													
2. HSPS-FR	.158												
3. RSQ-Fearful	.307	***	.392	***	—								
4. RSQ-Preoccupied	.198	*	.395	***	.138								
5. RSQ-Dismissive	.195	*	.033		.365	***	251	**					
6. RSQ-Secure	291	***	287	***	333	***	406	***	037		—		
7. RSQ-Model of self	279	***	445	***	474	***	768	***	.353	***	.690	***	
8. RSQ-Model of others	249	**	123		708	***	.344	***	750	***	.359	***	020

Table 1. Spearman's correlation matrix.

#### 5. Discussion, limitations and perspectives

First and foremost, sensory processing sensitivity and alexithymia are influenced by gender, with women generally showing higher levels of both traits, which is consistent with the existing literature (Trå et al., 20-23). Age did not have a significant effect in this study, probably due to the narrow age range (15-25 years). However, the literature suggests that sensitivity may decrease with age (Ueno et al., 2019), possibly due to the development of better coping strategies. In addition, alexithymia varied according to participants' status (school, university or work), possibly reflecting life changes associated with the transition to adulthood, such as gaining independence and developing emotion regulation strategies. Although HSPS did not directly influence alexithymia in this sample, a correlation expected based on published research (Jakobson & Rigby, 2021; McQuarrie et al., 2023), mediation analysis revealed that attachment styles played a significant role in this relationship. Specifically, the model of the self significantly mediated the relationship between SPS and alexithymia, supporting the idea that how individuals perceive themselves in relationships may be a crucial factor in emotional regulation. Individuals with higher SPS were more likely to have anxious and preoccupied attachment styles, which in turn were associated with higher levels of alexithymia. These findings are consistent with previous research suggesting that insecure attachment styles contribute to emotional dysregulation and difficulties in understanding emotions (Bowlby, 1969). In addition, a significant mediation effect was found for secure attachment, suggesting that individuals with high SPS who develop a secure attachment style may experience lower levels of alexithymia, potentially benefiting from the responsiveness and emotional support of their caregivers.

Figure 1. Mediation of the relationship between SPS and alexithymia through secure and fearful attachment styles.



This study does not distinguish between primary (trait) and secondary (state) alexithymia, which limits the interpretation of how alexithymia relates to sensory processing sensitivity and socio-emotional outcomes. Without this distinction, it is unclear whether alexithymia is a pre-existing trait in individuals with HSPS or a response to negative experiences. Furthermore, the prevalence of alexithymia in this sample (59.46 %) differs from the literature, raising concerns about sample representativeness and potential bias. While alexithymia is generally found in 10-13% of the population (Salminen et al., 1999), rates can vary depending on factors such as mental health, age and cultural context. Despite an acknowledged increase in alexithymia prevalence during adolescence (Joukamaa et al., 2007), and considering that our sample primarily consists of high school students, we are unable to account for such a significant elevation in our sample. This discrepancy raises concerns about potential biases and limitations in our study, and may impact the observed relationship between alexithymia and HSPS. Moreover, the study also overlooks other potential confounding variables, such as parenting style and individual differences in resilience and coping mechanisms, which may influence SPS, alexithymia and socio-emotional outcomes.

In conclusion, although HSPS alone does not directly influence alexithymia, its effect on individual emotionality appears to be mediated by attachment style. Highly sensitive individuals with insecure attachment styles may be more vulnerable to alexithymia, whereas those with secure attachments may experience protective effects. These findings highlight the importance of considering attachment dynamics when addressing emotional difficulties and exploring interventions to promote secure attachment patterns in individuals with HSPS.

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