

Original Research

Some Pathological and Non-Pathological Characteristics of the Highly Sensitive Person (HSP)

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Abstract

Background: The topic of Highly Sensitive Person (HSP) has become popular in recent times. This concept refers to individuals who possess the trait of “sensory processing sensitivity” (SPS) composed of features such as deep processing of sensory information, high emotional reactivity, easy overstimulation, and sensitivity to subtle detail. **Methods:** Using samples of university students and patients with social anxiety disorder and working with a modified version of the Highly Sensitive Person Scale, this study attempted to provide more information on some of the psychological problems with which SPS may be associated. **Results:** We found that SPS had statistically significant positive relationships with worries, ruminations, social anxiety, depression, dysfunctional anticipatory behaviors, perfectionism and some personality styles/disorders, and negative relationships with self-esteem, quality of life and some social skills. Similar results were found when people with high sensory processing sensitivity were compared to people with low sensory processing sensitivity. **Conclusions:** The study concluded that more research is needed to better define the SPS trait, its essential characteristics, advantages and disadvantages.

Keywords: highly sensitive person (HSP); sensory processing sensitivity (SPS); Highly Sensitive Person Scale (HSPS); psychological problems; psychopathology

Algunas Características Patológicas y no Patológicas de las Personas de Alta Sensibilidad (PAS)

Resumen

Antecedentes: El tema de las personas de alta sensibilidad (PAS) se ha popularizado en los últimos tiempos. Este concepto se refiere a las personas que poseen el rasgo de la «sensibilidad de procesamiento sensorial» (SPS) compuesto por características como el procesamiento profundo de la información sensorial, alta reactividad emocional, fácil sobreestimulación y sensibilidad a los detalles sutiles. **Métodos:** Utilizando una muestra de estudiantes universitarios y otra de pacientes con trastorno de ansiedad social y empleando una versión modificada de la “Escala de personas de alta sensibilidad”, este estudio intentó proporcionar más información sobre algunos de los problemas psicológicos con los que puede estar asociada la SPS. **Resultados:** Descubrimos que la SPS tenía relaciones positivas estadísticamente significativas con preocupaciones, rumiaciones, ansiedad social, depresión, comportamientos anticipatorios disfuncionales, perfeccionismo y algunos estilos/trastornos de la personalidad, y relaciones negativas con la autoestima, la calidad de vida y algunas habilidades sociales. Se obtuvieron resultados similares cuando se compararon personas de alta sensibilidad de procesamiento sensorial con personas de baja sensibilidad. **Conclusiones:** Se necesita más investigación para definir mejor el rasgo de SPS, sus características, así como sus ventajas e inconvenientes.

Palabras Claves: personas de alta sensibilidad (PAS); sensibilidad de procesamiento sensorial (SPS); Escala para personas de alta sensibilidad (HSPS); problemas psicológicos; psicopatología



1. Introduction

Aron and Aron (1997) introduced the concept of “Highly Sensitive Person” (HSP) to refer to individuals who possess the trait of “sensory processing sensitivity” (SPS) that controls how information is received and processed in the brain. According to some authors, SPS constitutes a temperament trait that is common, heritable and evolutionarily conserved. Individuals with high SPS are characterized by their relatively deep processing of sensory information, high emotional reactivity and empathy, greater awareness of subtle stimuli, and susceptibility to overstimulation, and that reflects individual differences in sensitivity and reactivity to environmental stimuli (e.g., Aron et al, 2012; Aron and Aron, 1997; Greven et al, 2019). High SPS is therefore an individual predisposition to receive and process external and internal stimuli more intensely than average relative to the population. According to the theory authors, this sensitivity would extend to sensory processing of aesthetic experiences, pain threshold, susceptibility to caffeine, loud sounds and perception of other people’s moods and feelings (Aron and Aron, 1997). These same authors associated SPS with a personality type, defined it according to that single feature and called it HSP, claiming that 15% to 20% of the population would have this trait.

Some SPS researchers consider it to be a partially innate trait, which may reflect an evolutionary behavior of risk-avoidance, in which individuals analyze the environment in detail before acting (Wolf et al, 2008). Others defend the goodness of the trait, pointing out that this condition would be associated with enhanced awareness of and responsiveness to the environment, as well as depth of cognitive processing (Acevedo et al, 2023), which can help these people to excel in areas such as creativity, empathy and the ability to observe details or make unique connections (e.g., Aron et al, 2012; Greven et al, 2019). However, this SPS is hypothesized to mediate the impact of environmental influences in a “for better and for worse” manner. The sensitive mind can easily become overwhelmed, leading to overstimulation and emotional overload for the HSP. SPS has also been associated with unfavorable characteristics such as hypersensitivity to pain, behavioral inhibition, lower subjective well-being, lower quality of life, a greater susceptibility to experience high levels of stress, symptoms of poor health and, particularly, with a range of psychological problems such as neuroticism, anxiety, depression, autistic traits, low assertiveness or difficulties in social interaction (e.g., Assary et al, 2024; Benham, 2006; Booth et al, 2015; Brindle et al, 2015; Costa-López et al, 2024; Ahadi and Basharpour, 2010; Kinnealey and Fuiek, 1999; Lionetti et al, 2019; Liss et al, 2008; Pfeiffer and Kinnealey, 2003; Wu et al, 2021). On the other hand, an attempt has been made to see to what extent the SPS measured by the HSPS is related to the Five Factor Model (FFM). These studies have found that neuroticism (positively) and, to a lesser extent, extraversion (negatively) significantly correlated with

the total score of the scale (e.g., Lionetti et al, 2018; Pluess et al, 2018; Smolewska et al, 2006; Sobocko and Zelenski, 2015).

The “Highly Sensitive Person Scale” (HSPS; Aron and Aron, 1997) is commonly used to assess SPS in adults. Its authors developed it based on clinical observation after extensive interviews with adults. This scale consists of 27 items, with a rating from 1 (“Strongly disagree”) to 7 (“Strongly agree”). Higher scores indicate greater SPS. Aron and Aron (1997) considered the HSPS to be unidimensional as did other researchers (e.g., Hofmann and Bistran, 2007; Neal et al, 2002; Smith et al, 2022). Nevertheless, many authors have found variability in its dimensional structure, proposing that the best fit was two-factor (Bobrowska and Liberska, 2023; Ershova et al, 2018; Evans and Rothbart, 2008; Rinn et al, 2018), three-factor (Booth et al, 2015; De Gucht et al, 2023; Grimen and Diseth, 2016; Konrad and Herzberg, 2019; Lionetti et al, 2018; Rocha-Nieto et al, 2025; Smolewska et al, 2006; Sobocko and Zelenski, 2015), four-factor (Bordarie et al, 2022; Meyer et al, 2005; Şengül-İnal and Sümer, 2017), five-factor (Chacón et al, 2021; May et al, 2020), and even six-factor (Blach and Egger, 2011) structure. In the factor analysis of the scale, some of its items have often been excluded in order to arrive at a consistent solution. For example, Bobrowska and Liberska (2023) eliminated six items in their adaptation of the HSP scale to Polish due to its low factor loadings, Konrad and Herzberg (2019) eliminated 13 items for the same reason, Ershova et al. (2018) also eliminated 13 items for different reasons, and Baryła-Matejczuk et al. (2021) reduced the scale to 10 items.

Given the significant social interest that has long existed in the topic of SPS and its measurement with the HSPS, we conducted research on the degree to which SPS is associated with a whole range of psychological conditions. To this end, we gathered data on the most frequent type of sample used in SPS research (university students) and a clinical sample class consisting of patients diagnosed with social anxiety disorder, following the recommendations of Greven et al. (2019).

2. Method

2.1 Participants

A total of 562 psychology students from the University of Granada (Spain) participated in the study, with a mean age of 20.13 years ($SD = 4.54$), of whom 114 were men ($means (M) = 20.70$ years; $standard deviation (SD) = 4.91$) and 448 were women ($M = 19.99$ years; $SD = 4.45$). A total of 117 patients diagnosed with social anxiety disorder (SAD), following the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013), from 5 countries also participated (54 from Ecuador, 17 from Paraguay, 18 from Bolivia, 8 from Puerto Rico and 20 from Spain), with a mean age of 24.90 years ($SD = 8.90$), of whom 42 were

Table 1. Items loadings on the “Highly Sensitive Persons Scale - Modified” (HSP-M20).

Factors in university students (N = 564)	Loadings	Factors in patients with social anxiety (N = 107)	Loadings
Factor 3. Ease of Excitation (EOE) Eigenvalue = 1.33; Explained variance = 6.68		Factor 1. Ease of Excitation (EOE) Eigenvalue = 4.68; Explained variance = 23.42	
11. I get rattled when I have a lot to do in a short amount of time (14)	0.62	4. I am annoyed when people try to get me to do too many things at once (16)	0.69
3. I tend to be more sensitive to pain (4)	0.58	3. I tend to be more sensitive to pain (4)	0.67
1. I am easily startled (13)	0.54	12. I try hard to avoid making mistakes or forgetting things (17)	0.62
19. When I have to compete or be observed while performing a task, I become so nervous or shaky that I do much worse than I should otherwise (26)	0.53	11. I get rattled when I have a lot to do in a short amount of time (14)	0.60
12. I try hard to avoid making mistakes or forgetting things (17)	0.52	2. Other people’s moods affect me (3)	0.60
13. I make a point to avoid violent movies and TV shows (18)	0.50	14. I become unpleasantly aroused when a lot is going on around me (19)	0.56
2. Other people’s moods affect me (3)	0.50	1. I am aware of subtleties in my environment (2)	0.55
2. When I was a child, my parents or teachers seemed to see me as sensitive or shy (27)	0.35	16. Changes in my life shake me up (21)	0.47
Factor 1. Low Sensory Threshold (LST) Eigenvalue = 4.62; Explained variance = 23.12		1. I am easily startled (13)	0.46
7. I am easily overwhelmed by things like bright lights, strong smells, coarse fabrics, or sirens close by (7)	0.74	8. I have a rich, complex inner life (8)	0.40
9. Loud noises make me uncomfortable (9)	0.68	13. I make a point to avoid violent movies and TV shows (18)	0.32
15. Being very hungry creates a strong reaction in me, disrupting my concentration or mood (20)	0.56	Factor 2. Low Sensory Threshold (LST) Eigenvalue = 1.92; Explained variance = 9.60	
14. I become unpleasantly aroused when a lot is going on around me (19)	0.55	9. Loud noises make me uncomfortable (9)	0.80
16. Changes in my life shake me up (21)	0.52	7. I am easily overwhelmed by things like bright lights, strong smells, coarse fabrics, or sirens close by (7)	0.78
5. I find myself needing to withdraw during busy days, into bed or into a darkened room or any place where I can have some privacy and relief from stimulation (5)	0.50	15. Being very hungry creates a strong reaction in me, disrupting my concentration or mood (20)	0.62
4. I am annoyed when people try to get me to do too many things at once (16)	0.41	19. When I have to compete or be observed while performing a task, I become so nervous or shaky that I do much worse than I should otherwise (26)	0.39
6. I am particularly sensitive to the effects of caffeine (6)	0.40	Factor 3. Aesthetic Sensitivity (AES) & miscellaneous Eigenvalue = 1.60; Explained variance = 7.99	
Factor 2. Aesthetic Sensitivity (AES) Eigenvalue = 1.73; Explained variance = 8.67		18. I make it a high priority to arrange my life to avoid upsetting or overwhelming situations (24)	0.62
17. I notice and enjoy delicate or fine scents, tastes, sounds, works of art (22)	0.70	6. I am particularly sensitive to the effects of caffeine (6)	0.56
1. I am aware of subtleties in my environment (2)	0.68	2. When I was a child, my parents or teachers seemed to see me as sensitive or shy (27)	0.51
8. I have a rich, complex inner life (8)	0.67	17. I notice and enjoy delicate or fine scents, tastes, sounds, works of art (22)	0.50
18. I make it a high priority to arrange my life to avoid upsetting or overwhelming situations (24)	0.48	Total explained variance = 41.01%	
Total explained variance = 38.46%			

Note: Gray-shaded areas: the name of each factor is gray-shaded for better comparison between the two samples. The number before each item represents the order of the item in the HSP-M20. At the end of each item, we have included the order number in which it appears on the 27-item “*High Sensitive Person Scale*” (HSPS) by Aron and Aron (1997).

men ($M = 25.43$ years; $SD = 8.40$) and 75 were women ($M = 24.61$ years; $SD = 9.21$).

2.2 Instruments

(a) *Highly Sensitive People Scale-Modified* (HSP-M20). A modification of the “Are you highly sensitive?” questionnaire proposed by Aron (1999) was used, eliminating 2 of the 22 items from the questionnaire due to some problems on comprehension in the Spanish language. The HSP-M20 (see Table 1) constitutes a reduced and slightly modified version of the most widespread and widely used self-report measure in research on sensory processing sensitivity called the “Highly Sensitive Person Scale” (HSPS) (Aron and Aron, 1997). Of the 27 items included in this last measure, 7 (items 1, 10, 11, 12, 15, 23 and 25) were omitted. The HSP-M20 (like the original scale by Aron and Aron, 1997) attempts to assess the degree of sensitivity that a person has to both external (mainly) and internal stimuli and events. The HSP-M20 is answered on a five-point Likert scale (from 1 = “Very uncharacteristic of me” to 5 = “Very characteristic of me”). The higher the score, the greater the SPS. This scale, together with other added items, has been commonly used in the evaluation of patients being treated for social anxiety problems (Salazar et al, 2022). In this study no statistically significant differences were found between countries within each sex.

(b) *Social Anxiety Questionnaire for Adults* (SAQ; Caballo et al, 2012). The SAQ was developed to assess social anxiety in Spain, Portugal, and most Ibero-American countries. The questionnaire consists of 30 items that are answered using a five-point Likert scale (from 1 = “Not at all or very little” to 5 = “A lot or very much”), indicating the degree of unease, stress or nervousness experienced in each social situation. The items are grouped into five dimensions (or subscales): (1) Interactions with strangers, (2) Interactions with people I find attractive, (3) Assertive expression of annoyance, disgust, or displeasure, (4) Criticism or embarrassment, and (5) Speaking in public/Interacting with people in authority. The higher the score, the higher the social anxiety, both in the different dimensions and in the total score. These dimensions were empirically identified with more than 30,000 non-clinical participants, over 1000 patients and the participation of 18 countries. The psychometric properties of the instrument can be found in Caballo et al. (2012). The internal consistency (Cronbach’s alpha) for the SAQ total score has ranged from 0.88 to 0.93 and that of the dimensions has ranged from 0.74 to 0.90. In this study it was 0.90 for the total score and 0.81, 0.77, 0.76, 0.67 and 0.86 in the corresponding dimensions for the university sample, and 0.95 for the total score and 0.89, 0.91, 0.86, 0.76 and 0.86 in the corresponding dimensions for the clinical sample.

(c) *Liebowitz Social Anxiety Scale, Self-Report Version* (LSAS-SR; Liebowitz, 1987). The LSAS-SR consists of 24 items assessing fear or anxiety (*Anxiety subscale*)

and avoidance (*Avoidance subscale*) of specific social situations. Participants are asked to rate their fear or anxiety on a Likert-type scale ranging from 0 (None) to 3 (Severe) as well as avoidance on the same type of scale, from 0 (Never) to 3 (Usually). The total score is obtained by adding the Anxiety subscale score and the Avoidance subscale score. The higher the score, the higher the anxiety or avoidance or both. The internal consistency (Cronbach’s alpha) found of the total LSAS-SR has ranged from 0.93 to 0.95 and that of the subscales has ranged from 0.83 to 0.93 (González et al, 1998; Terra et al, 2006). In this study, Cronbach’s alpha was 0.94, 0.90, and 0.88 for the total score and the Anxiety and Avoidance subscales, respectively, in the university sample, and 0.96, 0.94, and 0.93 in the clinical sample.

(d) *Beck Depression Inventory* (BDI-II; Beck et al, 1996). BDI-II measures the magnitude of depression by means of 21 items with four response options that are ordered according to severity, from 0 to 3 points. The respondent must choose the option that best describes his or her current situation during the last two weeks. The higher the score, the greater the presence of depressive symptoms. Reliability levels reported with Spanish samples are high (e.g., Salazar et al, 2014) and in the study by Salazar et al. (2022) Cronbach’s alpha was 0.90. In this study it was 0.92 for university students and 0.90 for patients.

(e) *Penn State Worry Questionnaire* (PSWQ; Meyer et al, 1990), Spanish version of Nuevo et al. (2002). The PSWQ is a unidimensional instrument that assesses the excessiveness, generality, and uncontrollability of worries and consists of 16 items that are answered on a five-point Likert scale (from 1 = “Not at all” to 5 = “Very much”). The original questionnaire (Meyer et al, 1990) contains five negative items (1, 3, 5, 8, 10 and 11), but the Spanish version used in this study contains the negative items reformulated into positive items due to the problematic nature of negatively worded items for Spanish speakers. The total score is obtained by adding the scores of all the items and the higher it is, the greater the degree of worry. The levels of internal consistency (Cronbach’s alpha) reported on the instrument are excellent (e.g., 0.92 on Counsell et al, 2017; 0.95 on Salazar et al, 2022). In this study, Cronbach’s alpha was 0.95 for the students and 0.94 for the patients.

(f) *Questionnaire for Avoidant Personality Disorder* (QAPD). The QAPD is a seven-items scale that measures Avoidant personality disorder (APD) derived from the personality questionnaire of the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II; First et al, 1999). The original response scale (yes/no) was modified to a 5-point Likert scale, from 1 = “Very uncharacteristic of me” to 5 = “Very characteristic of me”. The higher the score the higher the possibility of being diagnosed with a APD. In the study by Salazar et al. (2022) Cronbach’s alpha was 0.85 and in this study, it was 0.82 for university students and 0.85 for patients.

(g) *Rosenberg Self-Esteem Scale* (RSES; [Rosenberg, 1965](#); [Rosenberg et al, 1995](#)). The RSES is the most widely used self-report measure to assess self-esteem. According to Rosenberg (1965), it evaluates “the feeling that one is good enough” (p. 31). It consists of 10 items, five formulated positively and five negatively. Each item is answered on a four-point Likert scale (from 1 = “Strongly disagree” to 4 = “Strongly agree”). To calculate a total score of the negative items is inverted and all are added together. The higher the score, the higher the self-esteem. Regarding its internal consistency, Cronbach’s alphas of 0.81 ([Cheng et al, 2015](#)) and 0.88 ([Fleming and Courtney, 1984](#)) and test-retest reliability of 0.82 ([Fleming and Courtney, 1984](#)) have been reported. In the study by Salazar et al. (2022) Cronbach’s alpha was 0.87 and in this study, it was 0.89 for the university sample and 0.87 for the clinical sample.

(h) *Social Skills Assessment Questionnaire* (SOSAQ; [Caballo et al, 2017](#)). The SOSAQ is a 40-item questionnaire that assesses 10 social skills (four items per skill): (1) Interacting with strangers; (2) Expressing positive feelings; (3) Dealing with criticism; (4) Interacting with people I am attracted to; (5) Keeping calm in embarrassing situations; (6) Speaking in public/Interacting with people in authority; (7) Dealing with embarrassing situations; (8) Defending one’s rights; (9) Apologizing, and (10) Refusing requests. Each item is answered on a Likert scale, from 1 (“Very uncharacteristic of me”) to 5 (“Very characteristic of me”). No items were negatively worded, so that the score is obtained by adding the items directly. In each skill the minimum score is 1 and the maximum score is 20. The higher the score the higher the social skill assessed. Caballo et al. (2017) reported reliability coefficients (Guttman split-half reliability) between 0.66 and 0.89, and internal consistency (Cronbach’s alpha) between 0.64 and 0.90 for the SOSAQ dimensions and for the total score of 0.86 (Guttman’s) and 0.88 (Cronbach’s alpha). It has been significantly correlated with the Rathus Assertiveness Schedule ($r = 0.53$) and with the Social Anxiety Questionnaire for adults (SAQ) ($r = -0.49$) ([Salazar et al, 2022](#)). Cronbach’s alpha for the total score was 0.93 in the Salazar et al. (2022) research. In this study it was 0.89 for the total score and for the dimensions 0.80, 0.84, 0.79, 0.91, 0.74, 0.86, 0.63, 0.75, 0.84 and 0.81, respectively, in the university sample and 0.93 for the total score and for the dimensions of 0.81, 0.84, 0.88, 0.95, 0.84, 0.80, 0.74, 0.81, 0.89 and 0.86, respectively, in the clinical sample.

(i) *World Health Organization Quality of Life* (WHOQoL-Bref; [World Health Organization, 1996](#)). The WHOQoL-Bref consists of 26 items that assess the individual’s perception of his or her quality of life. The first two items are examined separately. Item one refers to the general perception of their quality of life and item two to the general perception of their health. The remaining 24 items are distributed in four domains, in which quality of life is assessed independently: (1) Physical health (7 items),

which refers to activities of daily living, medication dependence, energy and fatigue, mobility, pain and discomfort, sleep and work capacity; (2) Psychological (6 items), which refers to body image, positive and negative feelings, self-esteem, spirituality and personal beliefs, and higher processes (thinking, learning, memory and concentration); (3) Social relationships (3 items), which refers to personal relationships, social support and sexual activity; and (4) Environment (8 items), which refers to economic resources, physical security, the social security system (access and quality), family environment, opportunities to acquire new knowledge and skills, opportunities for leisure and free time activities, physical environment (pollution, noise, traffic, climate) and transportation. The items are answered on a five-choice Likert scale, and before the scores in each domain and overall are calculated, the scores of three items must be reversed. The higher the score, the higher the quality of life in the respective domain. In the study by Salazar et al. (2022) Cronbach’s alpha was 0.92, and in this study, it was 0.90 in university students and 0.90 in patients. Regarding the sections, in university students it was 0.72 (physical health), 0.83 (psychological area), 0.62 (social relations) and 0.74 (environment) and in patients the alpha was 0.57 (physical health), 0.63 (psychological area), 0.79 (social relations) and 0.78 (environment).

(j) *Anticipatory Social Behaviours Questionnaire* (ASBQ; [Hinrichsen and Clark, 2003](#)). The ASBQ is a 12-item questionnaire that assesses the type and level of cognitive strategies used by individuals prior to social situations. These include rehearsal for the upcoming situation, catastrophizing, and thinking about past social situations. Participants are asked to rate the frequency with which they typically engage in specific behaviors or have specific thoughts prior to a social situation. Each item is rated on a 1 (Never) to 4 (Always) scale, and higher scores indicate more use of maladaptive cognitive strategies. The internal consistency reported for ASBQ is high ($\alpha = 0.88$; [Hinrichsen and Clark, 2003](#)), and in this study it was 0.90 for the student sample.

(k) *Experiences Questionnaire* (EQ; [Fresco et al, 2007](#)). The EQ is a 17-item self-report measure composed by two subscales: (1) *Decentering subscale*, formed by the first 11 items which would indicate the ability to distance oneself from one’s thoughts and feelings. The higher the score on this subscale, the greater the capacity for distancing, which is a positive characteristic of the person. (2) *Rumination subscale*, formed by the six last items which would indicate that the person turns his thoughts over and over again. The higher the score, the more focused the person is on his own thoughts, which is a negative characteristic of the individual. Both subscales use a 5-point Likert scale. The Decentering subscale has been shown to have adequate to good internal consistency as well as convergent and divergent validity ([Fresco et al, 2007](#)). In the sample of students in this study it was 0.79 for Decentering and 0.74 for Rumination.

(l) *Multidimensional Perfectionism Scale* (MPS; Frost et al, 1990). The MPS has been developed to assess perfectionism, very common in people with social phobia. This scale consists of 35 items that are distributed over six subscales. In addition, there is a global perfectionism score, which is the sum of all subscales except Organization. The subscales are as follows: (1) *Concern over mistakes* (CM), composed of 9 items, which assess negative reactions to errors, a tendency to interpret mistakes as equivalent to failure and a tendency to believe that one will lose the respect to others after failure. (2) *Personal standards* (PS), composed of 7 items, which reflect the establishment of very high standards and the excessive importance given to these high standards for self-evaluation. (3) *Parent expectations* (PE), composed of 5 items, which assess the tendency to believe that parents themselves set very high goals. (4) *Parental criticism* (PC), composed of 4 items, which assess to the perception that the parents themselves are (or were) too critical. (5) *Doubting of actions* (D), composed of 4 items, which assess the extent to which people doubt their ability to perform tasks. (6) *Organization* (O), composed of 6 items, which assess the tendency to be orderly or organized and reflects an emphasis on order and discipline that has often been associated with perfectionism. This subscale is slightly different from the previous ones and is not included in the overall perfectionism score. Good internal consistency (Cronbach's alpha) has been demonstrated for both the general measure of perfectionism and the six subscales (Frost et al, 1990). In the sample of students in this study it was 0.93 for the total score and 0.90, 0.82, 0.87, 0.84, 0.71 and 0.88 for the subscales.

(m) *Exploratory Questionnaire of Personality* ("Cuestionario exploratorio de personalidad-III", CEPER-III; Caballo et al, 2011). This self-report instrument is composed of 168 items that assess 14 personality styles: paranoid, schizoid, schizotypal, histrionic, narcissistic, antisocial, borderline, avoidant, dependent, obsessive-compulsive, passive-aggressive, sadistic, self-defeating, and depressive. It also includes two items that assess sincerity. The first ten styles follow the DSM-5 criteria (APA, 2013), the passive-aggressive and depressive styles follow the DSM-IV criteria (APA, 1994), and the self-defeating and sadistic styles follow the DSM-III-R criteria (APA, 1987). Although the questionnaire's items follow the diagnostic criteria of personality disorders, the CEPER-III has been developed to assess personality styles. The response format is Likert-type, ranging from 1 = "Very uncharacteristic of me" to 7 = "Very characteristic of me". Internal consistency (Cronbach's alpha) for the overall score with Spanish samples has been excellent (0.97 in Caballo et al, 2011) and good (from 0.76 to 0.89) for each of the personality styles (Caballo et al, 2011). In the sample of students in this study, Cronbach's alpha was 0.97 for the total score and for the Paranoid styles 0.80, Schizoid 0.74, Schizotypal 0.81, Antisocial 0.73, Borderline 0.86, Histrionic 0.79, Nar-

cissistic 0.78, Avoidant 0.87, Dependent 0.86, Obsessive-compulsive 0.80, Passive-aggressive 0.73, Self-destructive 0.83, Depressive 0.91 and Sadistic 0.83.

2.3 Procedure

For the psychology students' sample, the questionnaires were completed in a class. They were filled out voluntarily and anonymously. For the clinical sample included in the study, it had been selected to participate in the "Multidimensional Intervention for Social Anxiety" (MISA) program (Caballo et al, 2023). The present study included data from patients obtained in the pre-treatment stage, before going through the program. Previous articles (Caballo et al, 2021; Salazar et al, 2022) have published data on the application of the MISA program to some of these patients.

2.4 Data Analysis

Initially, an analysis was performed on some of the psychometric properties of the PAS-M20, such as its factor structure by means of exploratory factor analysis, its internal consistency and reliability by calculating Cronbach's alpha and the Guttman split-half reliability, respectively, in the samples of students and patients with SAD.

Next, an analysis of the differences in means according to sex (using Student's *t* test) was performed regarding the temperamental trait of sensitivity to sensory processing to establish the discrepancies between men and women, both among university students and among patients.

Then, in order to analyze the relationship between the personality trait of SPS and other psychological difficulties, such as social anxiety, avoidant personality disorder, dysfunctional worries, depression, self-esteem, social skills and quality of life, the correlations (Pearson's *r*) were examined both in the student sample and in the patient sample. In the student sample, correlations (Pearson's *r*) were also examined for the three factors obtained from the PAS-M20 with anticipatory social behaviors, experiences (distancing and rumination), perfectionism and personality styles/disorders.

Finally, a sample of students was selected to compare, using Student's *t* test (and in some cases also using the Mann-Whitney U test), those who had the highest scores in the trait of high SPS with those who showed the lowest scores in that trait. To obtain these subsamples, we categorized subjects as highly sensitive when their HSP-M20 score was at least one standard deviation above the mean and as low sensitive when their score was at least one standard deviation below the mean.

3. Results

3.1 Exploratory Factor Analysis of the HSP-M20

Using exploratory factor analysis with oblique rotation, the most coherent solution for this scale was that of 3 factors in both samples. The cumulative variance was 33.46% for the university students and 41.01% for the pa-

tients with social anxiety disorder. In Table 1 we have included the items of these 3 factors for the two samples. The factor Ease of Excitation (EOE) shared 6 items across samples, the factor Low Sensory Threshold (LST) shared 3 items across samples and the factor Aesthetic Sensitivity (AES) shared 2 items across samples (although in the case of the patients the items included in this factor were not very coherent). The 3-factor solution was the one with the most congruent dimensions, although far from constituting an easily explainable situation, due to differences between the samples in the items that loaded on each factor and the low accumulated variances (see Table 1).

The factor analysis of this 20-item version of the HSP-M20 does not seem to yield clearly consistent results when comparing the content of the 3 factors in the two samples used in the study. The solutions with more factors, although they increased the percentage of accumulated variance, included very diverse items in each factor and item loading differed across samples. Taking these problems into account, we decided to use the total score of the HSP-M20 as the main variable when relating the SPS to the other variables used in this study. However, in the case of the students, and despite some problems of coherence in the factors found, we have also included convergent validity correlations with the other variables for those three factors, EOE, LST and AES, in the analyses.

Table 2 shows the correlations of the three factors with the total score of the HSP-M20 and between themselves in the sample of university students, clearly the EOE and LST factors are more related to each other than to AES.

3.2 Reliability of the HSP-M20

The analysis of internal consistency of the HSP-M20 was assessed using Cronbach's alpha, which in the case of the student sample was 0.81 for the overall score of the scale and 0.73, 0.57 and 0.70 for the factors Low Sensory Threshold, Aesthetic Sensitivity, and Ease of Excitability, respectively. In the sample of patients, Cronbach's alpha for the total score was 0.80 and 0.64, 0.19 and 0.79 for the factors Low Sensory Threshold, Aesthetic Sensitivity and Ease of Excitability, respectively.

Guttman split-half reliability was also calculated, which was 0.84 for the total score of the HSP-M20 and 0.78,

0.62 and 0.74 for the factors Low Sensory Threshold, Aesthetic Sensitivity, and Ease of Excitability, respectively, in the student sample. In the patient sample, Guttman split-half reliability was 0.80 for the total score of the HSP-M20 and 0.64, 0.12 and 0.81 for the factors Low Sensory Threshold, Aesthetic Sensitivity, and Ease of Excitability, respectively. Finally, the average correlation between items was 0.18 in both samples.

3.3 Gender Differences in the HSP-M20

In the sample of university students, women scored significantly higher than men ($p < 0.001$) in the total score of the HSP-M20. Regarding scale scores, only in the EOE factor did women score significantly higher than men ($p < 0.001$). In the sample of patients, these differences were not statistically significant ($p = 0.059$) although women scored higher than men on the HSP-M20 (Table 3).

We can also find that patients with SAD had higher averages than university students in the total score of the HSP-M20. When comparing the men in both samples, we also found that the differences were not statistically significant ($t = 1.54$; $p = 0.125$), while in women they were ($t = 2.02$; $p < 0.05$).

3.4 Correlations of the HSP-M20 Scale With Different Psychopathological Variables

The correlations between the scores on the HSP-M20 and those obtained in other variables used in this study are very diverse. We used instruments that assessed social anxiety (including avoidant personality disorder), worries, depression, social skills, self-esteem and quality of life in both university subjects and patients with SAD. In addition, in university students we also assessed dysfunctional anticipatory behaviors, the ability to distance oneself from one's own thoughts and feelings, ruminative thoughts, various facets of perfectionism, and personality styles/disorders (We chose to assess personality styles based on the DSM-IV/DSM-5/DSM-5-TR diagnostic criteria (APA, 1994, 2013, 2022) and not on the alternative DSM-5/DSM-5-TR classification based on the Big Five traits (Five Factor Model, FFM), since the contribution of this model to clinical practice and the treatment of personality disorders has been null so far (see Caballo et al, 2024

Table 2. Correlations among the different factors of the Highly Sensitive People Scale-Modified (HSP-M20) in university students.

Variable	Means	SD	1	2	3	4
1. PAS-M20 total	66.95	10.99	–	–	–	–
2. LST	24.74	5.78	0.86	–	–	–
3. AES	15.54	2.63	0.52	0.27	–	–
4. EOE	26.66	5.48	0.85	0.54	0.28	–

Notes: LST, Low Sensory Threshold; AES, Aesthetic Sensitivity; EOE, Ease of Excitation; SD, standard deviation. All correlations were statistically significant ($p < 0.001$).

Table 3. Mean differences between men and women in the HSP-M20 total and factors scores of university students and total score of SAD patients.

University students	Sex	<i>M</i>	<i>D</i>	<i>t</i>	<i>p</i>
PAS-M20					
Total score	Men	63.49	9.56	3.82	0.000
	Women	67.85	11.19		
Factor 1. LST	Men	23.85	5.51	1.78	0.076
	Women	24.93	5.86		
Factor 2. AES	Men	15.51	2.77	0.19	0.851
	Women	15.56	2.60		
Factor 3. EOE	Men	24.02	4.40	5.95	0.000
	Women	27.36	5.56		
SAD patients					
Total score	Men	66.43	11.56	1.90	0.059
	Women	70.74	10.91		

Notes: SAD, Social anxiety disorder. The sample of students comprised 114 men and 450 women, and the sample of patients included 37 men and 70 women.

for a more detailed review), despite the numerous studies conducted in the area).

Tables 4,5 present correlations found in the sample of university students, for the overall score of the HSP-M20 and its three factors. Thus, in Table 4 the highest correlations of high personal sensitivity were with the *Worries* ($r = 0.52$), with *Avoidant Personality Disorder* ($r = 0.49$) and *Social Anxiety* ($r_{LSAS} = 0.46$ and $r_{SAQ} = 0.44$), particularly in situations that have to do with criticism and embarrassment ($r = 0.39$) and those that require speaking in public or interacting to people in authority ($r = 0.37$), but also in interaction with strangers ($r = 0.32$) and in the assertive expression of annoyance, disgust or displeasure ($r = 0.31$). There were also positive correlations, although not as high as the previous ones ($0.20 < r < 0.30$) between high personal sensitivity and *Depression* ($r = 0.29$), and with the social skill of Apologizing ($r = 0.20$), and negative relationships with *Self-esteem* ($r = -0.27$), *Quality of Life*, particularly in the areas of physical health ($r = -0.29$), psychological ($r = -0.26$) and global ($r = -0.27$) quality of life and also with two types of *Social Skills* such as keeping calm in embarrassing situations ($r = -0.29$), speaking in public/interacting with people in authority ($r = -0.25$).

Regarding the factors of SPS in university students, the results of the EOE and the LST are very similar to those obtained with the overall high sensitivity, especially in the case of the former. However, the third factor, AES, had different correlations with many of the variables than those of the other two factors. For example, it did not have significant correlations with avoidant personality disorder or with social anxiety, except in situations that have to do with criticism and embarrassment ($r = 0.10$), nor with self-esteem and quality of life. The correlation with worries was also very low ($r = 0.13$) and, unlike the negative correlations of the HSP-M20, the EOE or the LST with social skills, the

AES had significant positive correlations with some but no other variables.

In Table 5 we find significant correlations between personal sensitivity and other variables such as *Rumination* ($r = 0.47$), *Anticipatory Social Behaviors* ($r = 0.44$) and *Perfectionist Doubts about one's ability to perform tasks* ($r = 0.45$). There were also significant correlations, although not as high as the previous ones ($0.20 < r < 0.40$) between high personal sensitivity and *negative reactions to mistakes* ($r = 0.32$), the *setting of very high standards* and the excessive importance given to these high standards for self-evaluation ($r = 0.24$) and *Perfectionism* in general ($r = 0.35$). Regarding personality styles, participants with high SPS were characterized by symptoms typical of *Avoidant* ($r = 0.47$), *Schizotypal* ($r = 0.46$), *Depressive* ($r = 0.43$), *Borderline* ($r = 0.42$) and *Dependent* ($r = 0.40$) personality styles. It is also interesting to highlight the low correlations, or lack of them, between high SPS and the antisocial, histrionic, narcissistic and sadistic personality styles.

Regarding the factors of high SPS, the results of the EOE and LST factors were also very similar to those obtained with overall high SPS. The correlations of the AES factor with the rest of the variables were considerably lower than in the case of the other two factors in most cases and in some of them there were no significant correlations, especially with certain personality styles (schizoid, avoidant, dependent, self-destructive, depressive and sadistic). In the *Decentering subscale* (the ability to distance oneself from one's own thoughts and feelings) of the EQ, the AES factor correlated significantly in a positive way, while both the HSP-M20 and the EOE and LST factors correlated negatively.

In the case of patients with SAD (Table 6), the highest correlation of high personal sensitivity was with *Worries* ($r = 0.63$). Other important correlations ($0.20 < r <$

Table 4. Correlations of the high personal sensitivity with different psychological variables in university students ($N = 562$).

Variables (instruments)	HPS (HSP-M20 Total)	LST	AES	EOE
Social anxiety (SAQ)				
Interaction strangers	0.32***	0.29***	−0.01	0.35***
Interaction attractive people	0.24***	0.22***	−0.05	0.27***
Assertive expression	0.31***	0.24***	0.08	0.34***
Criticism and embarrassment	0.39***	0.33***	0.10*	0.39***
Speaking in public/Authority	0.37***	0.29***	−0.02	0.45***
Overall social anxiety	0.44***	0.37***	0.02	0.49***
Social anxiety (LSAS-SR)				
Anxiety	0.46***	0.42***	0.03	0.46***
Avoidance	0.42***	0.40***	0.03	0.40***
Overall social anxiety	0.46***	0.43***	0.03	0.45***
Avoidant personality disorder (QAPD)	0.49***	0.44***	0.02	0.50***
Worries (PSWQ)	0.52***	0.39***	0.13**	0.56***
Depression (BDI-II)	0.29***	0.31***	0.05	0.23***
Social skills (SOSAQ)				
Interaction Strangers	−0.17***	−0.17***	0.13**	−0.22***
Expressing positive feelings	0.08	−0.03	0.19***	0.10*
Dealing with criticism	−0.09	−0.11**	0.18***	−0.14***
Interaction attractive people	0.01	−0.01	0.14***	−0.05
Keeping calm embarrassing sit	−0.29***	−0.25***	0.03	−0.32***
Speaking in public/Authority	−0.25***	−0.19***	0.08	−0.32***
Deal embarrass situations	0.01	−0.02	0.07	0.01
Defending one's rights	−0.10*	−0.04	0.07	−0.19***
Apologizing	0.20***	0.04	0.26***	0.23***
Refusing requests	−0.05	−0.02	0.10*	−0.13**
Overall social skills	−0.13**	−0.16***	0.23***	−0.21***
Self-esteem (RSES)				
Positive items	−0.23***	−0.24***	0.11**	−0.26***
Negative items	−0.28***	−0.26***	0.02	−0.29***
Overall self-esteem	−0.27***	−0.27***	0.07	−0.29***
Quality of life (WHOQoL)				
Perception quality life	−0.13**	−0.14***	0.03	−0.12**
Perception quality health	−0.07	−0.10*	0.06	−0.06
Physical health	−0.29***	−0.33***	0.03	−0.25***
Psychological	−0.26***	−0.30***	0.07	−0.24***
Social relationships	−0.16***	−0.20***	0.00	−0.10*
Environmental	−0.17***	−0.21***	0.08	−0.15***
Overall quality of life	−0.27***	−0.31***	0.06	−0.24***

Notes: SAQ, Social Anxiety Questionnaire for Adults; LSAS-SR, Liebowitz Social Anxiety Scale, Self-Report version; QAPD, Questionnaire for Avoidant Personality Disorder; PSWQ, Penn State Worry Questionnaire; SOSAQ, Social Skills Assessment Questionnaire; RSES, Rosenberg Self-Esteem Scale; WHO-QoL, World Health Organization Quality of Life. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

0.40) were with global *Social Anxiety* ($r = 0.39$ in both the LSAS and the SAQ), especially in situations that have to do with criticism and embarrassment ($r = 0.46$), those that require the assertive expression of annoyance, disgust or displeasure ($r = 0.40$), and speaking in public or interacting to people in authority ($r = 0.38$), with *Avoidant Personality Disorder* ($r = 0.39$), with *Depression* ($r = 0.38$), with a type of *Social Skill* such as keeping calm in embarrassing situations ($r = -0.41$), *Self-esteem* ($r = -0.30$) and with *Quality*

of Life ($r = -0.27$), particularly in the general perception of their quality of life ($r = -0.31$), the general perception of their health ($r = -0.26$), environmental factors that help quality of life ($r = -0.24$) and their psychological health ($r = -0.23$). Also interesting is the total lack of correlation with most social skills. Finally, it should be noted that the questionnaires shown in Table 5 were not administered to patients with SAD.

Table 5. Correlations of the high personal sensitivity with different psychological variables ($N = 562$) and personality styles/disorders ($N = 392$) in university students.

Variables (instruments)	HPS (HSP-M20 total)	LST	AES	EOE
Anticipatory behaviors (ASBQ)	0.44***	0.38***	0.14***	0.41***
Experiences Questionnaire (EQ)				
Decentering	−0.20***	−0.19***	0.16***	−0.27***
Rumination	0.47***	0.38***	0.32***	0.38***
Perfectionism (MPS)				
Concern mistakes	0.32***	0.33***	0.08	0.26***
Personal standards	0.24***	0.22***	0.24***	0.14***
Parent expectations	0.13**	0.16***	0.13**	0.03
Parental criticism	0.19***	0.22***	0.10*	0.09*
Doubting of actions	0.45***	0.38***	0.13**	0.45***
Organization	0.15***	0.06	0.17***	0.16***
Overall perfectionism	0.35***	0.35***	0.18***	0.25***
Personality styles/disorders (CEPER)				
Paranoid style	0.39***	0.41***	0.18***	0.27***
Schizoid style	0.32***	0.42***	0.03	0.21***
Schizotypal style	0.46***	0.44***	0.29***	0.34***
Antisocial style	0.14**	0.21***	0.12*	0.00
Borderline style	0.42***	0.43***	0.16	0.32***
Histrionic style	0.04	0.02	0.18***	−0.03
Narcissistic style	0.16**	0.17***	0.26***	0.03
Avoidance style	0.47***	0.42***	0.04	0.50***
Dependent style	0.40***	0.34***	0.04	0.45***
Obsessive-compulsive style	0.30***	0.23***	0.19***	0.28***
Passive-aggressive style	0.30***	0.36***	0.11*	0.18***
Self-defeating style	0.36***	0.38***	0.05	0.32***
Depressive style	0.43***	0.44***	0.09	0.37***
Sadistic style	0.11*	0.21***	−0.06	0.04

Notes: ASBQ, Anticipatory Social Behaviours Questionnaire; EQ, Experiences Questionnaire; MPS, Multidimensional Perfectionism Scale; CEPER, Exploratory Questionnaire of Personality. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

3.5 Differences Between Participants With High and Low Sensory Processing Sensitivity

Although the correlations between the scores obtained on the high SPS scale and the rest of the variables were statistically significant in most cases, we examined differences between participants with high and low sensory processing sensitivity in the student sample. We did not do this in the sample of patients with SAD because the sample size was small and there would be too few participants in the extreme groups. The results for female university students are shown in Table 7 and for male university students in Table 8.

As we can see in Table 7, the differences between university women with high and low SPS were significant in almost all the variables (except for some types of social skills and an area of quality of life—the perception of the quality of their health). Women with high SPS had more *Worries*, more *Social Anxiety* (including *Avoidant Personality Disorder*), lower *Self-esteem*, lower *Quality of Life* ($p < 0.001$), and had greater difficulty with some types of *Social Skills* than women with low SPS.

In Table 7 we can see that women with high sensory processing sensitivity scored significantly higher on almost all variables than women with low SPS (with $p < 0.001$ in most cases). Highly sensitive women had more *Anticipatory Behaviors*, more *Rumination*, more *maladaptive Perfectionist ideas* of all kinds, less *ability to Distance themselves* from their own thoughts and feelings, and scored significantly higher than low SPS women in almost all *Personality styles*, except for *histrionic* and *sadistic* personality styles, although the differences in *antisocial* and *narcissistic* styles were barely significant as were correlations with measures of perfectionist ideas regarding the tendency to believe that one's parents set very high goals and the tendency to be neat or organized, reflecting an emphasis on order and discipline that has often been associated with perfectionism.

Regarding male university students (Table 8), those with high sensory processing sensitivity had more *Worries*, more *Social Anxiety* (including *Avoidant Personality Disorder*), lower *Self-esteem*, were more *Depressed*, had a lower *Quality of Life* in general and in three of its facets ($p < 0.001$

Table 6. Correlations of the high personal sensitivity with different psychological variables in patients with social anxiety (N = 107).

Variables (instruments)	HPS (HSP-M20 Total)
Social anxiety (SAQ)	
Interaction strangers	0.25**
Interaction attractive people	0.28**
Assertive expression	0.40***
Criticism and embarrassment	0.46***
Speaking in public/Authority	0.38***
Overall social anxiety	0.39***
Social anxiety (LSAS-SR)	
Anxiety	0.40***
Avoidance	0.34***
Overall social anxiety	0.39***
Avoidant personality disorder (QAPD)	0.39***
Worries (PSWQ)	0.63***
Depression (BDI-II)	0.38***
Social skills (SOSAQ)	
Interaction Strangers	-0.19*
Expressing positive feelings	0.04
Dealing with criticism	-0.09
Interaction attractive people	-0.17
Keeping calm embarrassing situations	-0.41***
Speaking in public/Authority	-0.19*
Dealing with embarrassing situations	-0.01
Defending one's rights	-0.15
Apologizing	0.03
Refusing requests	-0.10
Overall social skills	-0.18
Self-esteem (RSES)	
Positive items	-0.28**
Negative items	-0.26**
Overall self-esteem	-0.30**
Quality of life (WHOQoL)	
Perception quality life	-0.31**
Perception quality health	-0.26**
Physical health	-0.17
Psychological	-0.23*
Social relationships	-0.16
Environmental	-0.24*
Overall quality of life	-0.27**

Notes: LSAS, Liebowitz Social Anxiety Scale, Self-Report version. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

or $p < 0.01$), greater difficulty in two types of *Social Skills* (*coping with criticism* and *keeping calm in embarrassing situations*) than men with low SPS. Although we used *t*-test as our main tool for finding possible differences, we also used non-parametric statistics (Mann-Whitney U test) to confirm these differences due to the low number of participants in the two groups (Table 8).

In Table 8 we can see that male university students who scored high on sensory processing sensitivity scored significantly higher on most of the variables than men who scored low on SPS. The differences were not as high as in the case of women due to the smaller sample size. Highly SPS men had more *Rumination*, more *Perfectionist* ideas in general and particularly in negative reactions to errors, in the tendency to interpret mistakes as equivalent to failure and to believe that one will lose the respect of others after this failure, and in the extent to which people doubt about their ability to perform tasks, had more *Anticipatory Behaviors*, and they also scored higher in different *Personality styles* (particularly the *avoidant style*) than low SPS men.

4. Discussion

The main objective of the present study was to shed further light on the personality trait “sensory processing sensitivity”, particularly about its relationships with other psychological variables. Our data highlight important problems when it comes to the evaluation of the characteristics of the “highly sensitive person” (HSP) which, it is assumed, is identified by manifesting elements of the SPS trait. To assess the SPS we used the “Highly Sensitive Person Scale-Modified” (HSP-M20), a modified (20-item) version of Aron and Aron’s (1997) “*Highly Sensitive Person Scale*” (HSPS) (27-item). For this reason, we decided to initially analyze some of the psychometric properties of the HSPS-M20.

The factor structure obtained with the HSP-M20, which includes most of the items proposed by the original authors of the scale, was not consistently maintained in both clinical and non-clinical subjects. We found a tri-factorial solution (“Ease of excitability” [EOE], “Low sensory threshold” [LST] and “Aesthetic sensitivity” [AES]) in which the factors seem more coherent, but far from the expected results. The diversity in dimensional structure found in the HSPS has been the norm in studies on the HSP (see the introductory section of this study) and our results confirmed the idea that the dimensional structure of the HSPS remains unclear and is likely to need modifications to assess the essential characteristics of the HSP. The HSPS has often been used with the assumption of the sensory processing sensitivity as a one-dimensional construct, but recent data have supported three factors (EOE, LST, and AES) or more as the basic structure of the SPS. The latter would make a certain amount of sense, as it seems that AES has very different characteristics to the other two dimensions. It would be the positive feature of the HSP, which have other different features, generally with less positive connotations, such as EOE and LST.

In our study we have had the same problems as many researchers, not finding a clear one-dimensional or multidimensional structure for the HSP-M20. The three-dimensional structure found has been especially problem-

Table 7. Differences between women university students with high and low sensory sensitivity.

Variables (instruments)	Low sensitivity (<i>n</i> = 67)		High sensitivity (<i>n</i> = 80)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Social anxiety (SAQ)						
Interaction strangers	12.30	4.35	17.16	5.33	−5.98	0.000
Interaction attractive people	18.58	4.68	21.37	4.70	−3.59	0.000
Assertive expression	15.95	4.82	20.31	4.44	−5.69	0.000
Criticism and embarrassment	17.60	4.56	22.35	3.49	−7.16	0.000
Speaking in public/Authority	16.34	5.21	22.24	5.26	−6.80	0.000
Overall social anxiety	80.78	16.70	103.44	16.64	−8.21	0.000
Social anxiety (LSAS-SR)						
Anxiety	17.79	8.63	33.55	12.3	−8.77	0.000
Avoidance	14.85	9.33	29.17	11.89	−8.01	0.000
Overall social anxiety	32.77	16.49	62.72	22.25	−9.07	0.000
Avoidant personality disorder (QAPD)	14.00	5.01	22.99	6.62	−9.13	0.000
Worries (PSWQ)	40.03	13.07	61.40	13.25	−9.80	0.000
Depression (BDI-II)	9.62	9.67	17.47	11.53	−4.40	0.000
Social skills (SOSAQ)						
Interaction Strangers	12.94	4.24	11.29	3.29	2.65	0.009
Expressing positive feelings	16.28	3.5	17.11	3.55	−1.42	0.158
Dealing with criticism	15.72	3.66	15.04	3.35	1.17	0.243
Interaction attractive people	9.27	4.21	9.48	4.16	−0.30	0.760
Keeping calm embarrassing sit	13.13	2.95	10.3	3.52	5.18	0.000
Speaking in public/Authority	12.46	4.22	9.52	4.06	4.29	0.000
Deal. embarrass situations	10.00	2.96	10.29	3.69	−0.51	0.608
Defending one's rights	12.22	3.93	10.59	3.53	2.66	0.009
Apologizing	16.27	3.35	17.99	2.75	−3.42	0.001
Refusing requests	13.43	3.46	12.92	3.65	0.86	0.391
Overall social skills	131.89	20.13	124.43	19.25	2.28	0.024
Self-esteem (RSES)						
Positive items	16.67	2.88	14.95	3.53	3.20	0.002
Negative items	15.98	3.26	13.31	3.66	4.63	0.000
Overall self-esteem	32.66	5.58	28.26	6.76	4.24	0.000
Quality of life (WHOQoL)						
Perception quality life	4.03	0.67	3.75	0.93	2.04	0.043
Perception quality health	3.49	1.08	3.45	1.18	0.23	0.821
Physical health	26.86	4.45	23.09	4.73	4.95	0.000
Psychological	22.06	4.19	18.91	4.80	4.18	0.000
Social relationships	11.67	2.41	10.15	2.81	3.48	0.001
Environmental	30.89	4.33	29.02	5.27	2.31	0.022
Overall quality of life	99.01	14.15	88.56	15.68	4.18	0.000
Anticipatory behaviors (ASBQ)	31.69	9.29	45.2	10.68	−8.10	0.000
Experiences Questionnaire (EQ)						
Decentering	36.57	4.90	33.2	7.64	3.10	0.002
Rumination	19.60	4.28	25.42	3.85	−8.64	0.000
Perfectionism (MPS)						
Concern mistakes	18.57	8.06	25.52	9.70	−4.63	0.000
Personal standards	18.91	6.12	23.29	6.12	−4.32	0.000
Parent expectations	12.18	5.36	14.13	6.26	−2.00	0.047
Parental criticism	7.92	3.62	9.95	4.89	−2.79	0.006
Doubting of actions	9.67	2.89	14.72	3.66	−9.08	0.000
Organization	20.85	5.13	22.77	5.04	−2.29	0.024
Overall Perfectionism	67.34	21.14	87.75	23.29	−5.40	0.000

Table 7. Continued.

Variables (instruments)	Low sensitivity (<i>n</i> = 67)		High sensitivity (<i>n</i> = 80)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Personality styles/disorders (CEPER)	Low sensitivity (<i>n</i> = 59)		High sensitivity (<i>n</i> = 47)			
Paranoid style	28.78	11.04	42.05	12.41	−5.68	0.000
Schizoid style	27.30	9.24	37.74	11.38	−5.09	0.000
Schizotypal style	24.19	9.70	41.29	13.05	−7.48	0.000
Antisocial style	26.55	7.92	30.96	10.10	−2.45	0.016
Borderline style	29.21	11.10	46.79	15.60	−6.49	0.000
Histrionic style	38.59	12.12	39.24	12.58	−0.27	0.790
Narcissistic style	35.89	12.84	41.00	12.13	−2.09	0.039
Avoidance style	29.54	9.61	50.74	15.54	−8.11	0.000
Dependent style	35.11	10.59	51.09	12.76	−6.81	0.000
Obsessive-compulsive style	42.62	12.46	52.63	11.86	−4.22	0.000
Passive-aggressive style	32.38	11.23	40.19	10.64	−3.64	0.000
Self-defeating style	24.70	9.41	37.12	12.94	−5.51	0.000
Depressive style	27.47	13.18	48.03	17.93	−6.57	0.000
Sadistic style	18.08	8.42	20.56	7.94	−1.55	0.124

atic with the sample of patients with social anxiety, especially due to the lack of coherence between the items that composed the factors, particularly the AES factor. It is true that the sample of patients was too small for a factor analysis, but the much larger sample of university students did not yield clear factors either, except in the case of factor 1 (EOE) which coincided, to a large extent, with the items obtained in the same factor by other researchers (e.g., [Khosravani et al, 2021](#); [Smolewska et al, 2006](#)). On the other hand, it is not clear whether some items belong to the EOE dimension or to the LST dimension, since, due to the way they are formulated, they could belong to either one. As we have seen, the correlation between the two factors is relatively high ($r = 0.54$). For all these reasons, it seems clear that a review of the essential features of the SPS that characterize the HSP is needed and, therefore, a refinement of its evaluation instruments, especially the scale that is usually used to measure it, the HSPS of Aron and Aron (1997).

Accepting that the HSP-M20 assesses a large part of the characteristics of the SPS, we would like to discuss the relationships found between the trait of sensitivity to sensory processing and the psychological difficulties or problems assessed in this study. First of all, we have confirmed that women score higher than men on the SPS in the sample of university students (and barely in the case of patients with SAD, due to the low number of subjects and the high variance of the sample), consistent with the results from other studies (e.g., [Aron and Aron, 1997](#); [Baryła-Matejczuk et al, 2021](#); [Aron, 2010](#); [Greven et al, 2019](#); [Konrad and Herzberg, 2019](#); [Rocha-Nieto et al, 2025](#)). It would seem that women are more responsive than men to both internal and external stimuli, which could sometimes be an advantage, but in most situations (according to the scale items) it would be a disadvantage (e.g., being easily startled, getting rattled when having to do many things in a short amount of

time, and so on). Looking closely at the three factors of the HSP-M20 (in the university sample), we find that such differences are present only in the factor “Ease of excitability” (EOE), supporting the idea that this factor is the main support for the differences between men and women and not so much the other two factors (LST and AES).

Regarding the results found between the HSP-M20 (and its three factors in the sample of university students) with the psychological difficulties or problems assessed, they tell us that the SPS is related to dysfunctional worries, social anxiety, poor social skills, low self-esteem, negative anticipations about the social situations one has to face, frequent rumination, doubts about their ability to perform certain tasks, a tendency to interpret mistakes as failures thinking that they may lose the respect of others as a result, behaviors that can sometimes seem strange or fickle, and depressive behaviors and thoughts. SPS is not related to an active social life or to antisocial acts or acts that try to harm others. Finally, SPS is negatively related to quality of life, both in general and in specific aspects. The EOE and LST factors confirm these relationships, but not the third factor, AES. This dimension was positively related to several healthy aspects of behavior (e.g., some types of social skills, the ability to distance oneself from thoughts and feelings, and also with self-esteem) and was hardly related to negative aspects, as was the case with the other two dimensions. With regard to patients, the correlations found confirm the main results for university students (in the variables evaluated in both samples and with the total score on the HSP-M20 scale).

Our findings largely confirm some of the results obtained in other studies showing that participants with high levels of SPS were more likely to report internalized problems, such as anxiety symptoms (e.g., [Blach and Egger, 2011](#); [Ben-Avi et al, 2012](#); [Hofmann and Bitran, 2007](#);

Table 8. Differences between men university students with high and low sensory sensitivity.

Variables (instruments)	Low sensitivity (n= 16)		High sensitivity (n= 20)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Social anxiety (SAQ)						
Interaction strangers*	12.56	5.61	17.40	5.33	−2.64	0.012
Interaction attractive people**	16.25	4.78	21.35	4.74	−3.20	0.003
Assertive expression**	13.87	3.01	18.60	4.84	−3.41	0.002
Criticism and embarrassment***	15.00	3.97	21.25	3.46	−5.04	0.000
Speaking in public/Authority	15.56	4.50	19.30	5.39	−2.22	0.033
Overall Social anxiety***	73.25	16.23	97.90	16.67	−4.46	0.000
Social anxiety (LSAS-SR)						
Anxiety***	16.37	9.88	31.55	14.12	−3.64	0.001
Avoidance**	12.25	11.02	28.70	15.79	−3.53	0.001
Overall Social anxiety***	28.62	20.00	60.25	27.88	−3.81	0.001
Avoidant personality disorder (QAPD)***	14.25	5.86	23.35	5.55	−4.77	0.000
Worries (PSWQ)***	37.44	11.25	54.65	13.77	−4.03	0.000
Depression (BDI-II)**	6.31	6.54	15.63	10.72	−3.03	0.005
Social skills (SOSAQ)						
Interaction Strangers	13.12	3.84	10.60	3.94	1.93	0.062
Expressing positive feelings	17.19	2.93	16.80	3.32	0.37	0.716
Dealing with criticism*	16.37	2.12	14.45	2.66	2.35	0.025
Interaction attractive people	11.50	5.03	9.30	3.78	1.50	0.143
Keeping calm embarrass sit**	13.87	3.12	10.95	2.89	2.91	0.006
Speaking in public/Authority	12.19	3.90	11.05	3.57	0.91	0.369
Deal embarrass situations	11.25	2.67	10.55	3.52	0.66	0.515
Defending one's rights	11.19	2.90	12.15	3.30	−0.92	0.366
Apologizing	16.00	3.26	17.60	2.23	−1.74	0.090
Refusing requests	14.62	3.36	14.45	3.57	0.15	0.882
Overall social skills	137.31	18.54	127.90	16.52	1.61	0.117
Self-esteem (RSES)						
Positive items**	17.87	2.16	14.25	3.73	3.45	0.002
Negative items*	15.87	2.19	13.05	3.87	2.60	0.014
Overall Self-esteem*	33.75	4.04	27.30	7.34	3.15	0.003
Quality of life (WHOQoL)						
Perception quality life	4.06	0.77	3.45	1.05	1.95	0.060
Perception quality health**	4.12	0.81	3.20	0.77	3.51	0.001
Physical health	27.50	4.50	24.60	5.16	1.77	0.086
Psychological**	22.56	3.40	17.75	5.08	3.25	0.003
Social relationships*	11.12	2.06	9.31	2.56	2.27	0.030
Environmental	31.40	3.91	28.85	4.59	1.73	0.093
Overall quality of life*	100.20	12.63	86.63	16.44	2.64	0.013
Anticipatory behaviors (ASBQ)*	34.87	8.69	43.10	12.06	−2.29	0.028
Experiences (EQ)						
Decentering	39.37	7.93	35.20	8.19	1.54	0.133
Rumination**	20.19	4.32	24.90	3.16	−3.78	0.001
Perfectionism (MPS)						
Concern mistakes**	17.25	6.42	27.45	9.28	−3.73	0.001
Personal standards	19.25	6.70	22.75	7.35	−1.48	0.149
Parent expectations	10.81	4.68	13.85	5.33	−1.79	0.082
Parental criticism	7.44	2.71	9.60	4.11	−1.81	0.079
Doubting of actions**	9.75	3.13	13.30	3.46	−3.19	0.003
Organization	20.50	5.02	21.70	5.53	−0.67	0.505
Overall perfectionism**	64.50	16.95	86.95	24.68	−3.10	0.004

Table 8. Continued.

Variables (instruments)	Low sensitivity (<i>n</i> = 16)		High sensitivity (<i>n</i> = 20)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Personality styles/disorders (CEPER)	Low sensitivity (<i>n</i> = 14)		High sensitivity (<i>n</i> = 16)			
Paranoid style	34.36	14.97	41.93	12.88	−1.46	0.155
Schizoid style	31.36	8.74	40.00	12.51	−2.16	0.039
Schizotypal style*	27.86	11.53	41.62	15.73	−2.70	0.012
Antisocial style	33.07	11.21	34.47	12.19	−0.32	0.751
Borderline style*	30.43	11.58	43.25	18.07	−2.27	0.031
Histrionic style	45.50	13.97	40.69	10.27	1.08	0.288
Narcissistic style	42.86	14.98	47.44	8.82	−1.04	0.309
Avoidance style**	28.93	12.56	48.75	16.31	−3.69	0.001
Dependent style*	34.78	12.99	45.75	14.09	−2.20	0.036
Obsessive-compulsive style	40.71	8.84	49.81	11.78	−2.36	0.025
Passive-aggressive style	34.71	10.10	42.81	11.22	−2.06	0.048
Self-defeating style	27.86	10.33	36.12	14.16	−1.80	0.082
Depressive style	28.85	11.19	42.19	20.19	−2.13	0.043
Sadistic style	20.43	10.51	24.69	12.37	−1.01	0.322

Note: *Indicates that there were also significant differences using non-parametric statistics (Mann-Whitney U) with $*p < 0.05$; $**p < 0.01$; $***p < 0.001$.

Meredith et al, 2016), depression (Ahadi and Basharpour, 2010; Blach and Egger, 2011; Booth et al, 2015; Pluess and Boniwell, 2015; Wu et al, 2021; Yano et al, 2021), difficulties in regulating emotions (Brindle et al, 2015), higher levels of stress (Bakker and Moulding, 2012; Benham, 2006), burnout (Redfearn et al, 2020; Stefan Lindsay, 2017), physical and psychological variables or symptoms associated with ill health or health complaints and ailments (Benham, 2006; Booth et al, 2015; Costa-López et al, 2024; Grimen and Diseth, 2016) or difficulties in social interaction (Ahadi and Basharpour, 2010; Ben-Avi et al, 2012). Additionally, we found that women with higher SPS compared to those with lower SPS scored higher on measures of dysfunctional concerns, social anxiety, depression, negative anticipations about social situations, rumination, dysfunctional perfectionist aspects and in almost all personality styles. On the other hand, they had lower scores in many of the social skills, in self-esteem, in quality of life and in distancing themselves from their own thoughts and feelings. The men followed basically the same pattern as the women, with the exception that some differences did not reach statistical significance.

Summarizing the findings obtained in this study, we can say that highly SPS people are much more likely to suffer from a whole range of psychological problems than low SPS people, as well as having worse social skills and a lower quality of life. There was, however, one social skill in which the HSP scored higher than low-sensitivity people, and significantly so in the case of women. That skill was “Apologizing”. And although this type of behavior constitutes a social skill, we do not know if the HSP engage in this skill adequately as opposed to excessively or at the appropriate times. We should also point out that the histrionic,

antisocial, narcissistic and sadistic personality styles are not something in which the HSP excel. And except for the positive extraverted characteristics of the histrionic style, the rest of the styles do not usually involve many prosocial elements.

What can this study on HSP contribute? Firstly, that this construct is not clearly defined. We have no doubt that there are people who are more sensitive than others, people with a genetic tendency to be more easily affected by both internal and external stimuli, and that this trait may have or may have had an evolutionary function. However, many of the main characteristics of HSPs constitute an obstacle in our society, as well as being a factor of vulnerability for many psychological problems. This does not mean that some aspects cannot be positive, such as the elements that compose the dimension of “Aesthetic Sensitivity”. But the rest of the components do not favor mental health in our culture. In an ideal, utopian society, it might be different, but not in the circumstances that most human beings have to go through. The positive view of these findings is that we may be able to prevent a whole series of problems that can develop into the HSP, particularly if we can identify the main characteristics in childhood that will lead to HSP. This would allow us to intervene early with cognitive behavioral therapy to improve those characteristics and make them more adaptive. We could possibly prevent future problems and also help improve many of the dysfunctional behaviors of the HSP in adult life. For example, in the application of our program “Multidimensional Intervention for Social Anxiety” (MISA) we have managed not only to decrease social anxiety, improve self-esteem, decrease depression and worries, and improve social skills and the quality of life of the participants, we have also man-

aged to significantly reduce SPS after 4 months of treatment and for this change to remain at six months (Salazar et al, 2022). High levels of SPS do not help us to function properly in everyday life. Being very sensitive to pain, being easily frightened or startled, being habitually affected by the state of others or having our performance deteriorate when we are observed are not typically adaptive qualities in our society, but they are common behaviors of the HSP. Other features, although not adaptive, also cause discomfort or impairment, such as having to withdraw when there is too much stimulation, being easily overwhelmed by loud noises or bright lights, or making excessive efforts to avoid making mistakes. Finally, there are also some aspects of SPS that can have positive qualities, such as perceiving and enjoying certain scents, sounds, tastes or works of art.

Considering all the elements that characterize a HSP, we could ask a question: Is it worth being a HSP? For better or for worse, we have no choice. Our biology and our initial learning history are not eligible. As we have seen in this study, the characteristics of HSP are associated with a whole series of psychological problems. It is not that all HSP have them, but it is easier that they acquire them. Let's say their characteristics predispose them to a series of psychological problems. But there are also positive aspects, without supporting the exaggeration of some HSP advocates who write that this trait is related to exceptional benefits when the person grows up, is raised and spends time in positive and favorable environments (Pluess and Belsky, 2010; Pluess and Boniwell, 2015; Pluess, 2015). The three personality styles/disorders that are defined by causing suffering in others without those who possess them suffering from their own behaviors, the antisocial, the narcissistic and the sadistic, do not seem to be very much related to HSP. It is possible that the lack of empathy that characterizes these styles/disorders is one of the explanatory factors. All this information helps us understand what we can expect from a HSP. And it also helps these people to provide a possible explanation for some of their behaviors and feel relieved. But this relief should not mean a justification of the problematic behavior that some people manifest, a justification for not changing if one wants to do so. There are cognitive behavioral treatments that can help the HSP modify their dysfunctional thoughts, feelings or behaviors, if they wish. It is likely that in that case they have already developed some psychological problems, such as social anxiety, depression, or generalized anxiety. Given that acceptance of negative affective states has been shown to partially mediate the association between SPS and depressive symptoms (Brindle et al, 2015) and given that associations between SPS and anxiety were found especially when mindfulness and acceptance were low (Bakker and Moulding, 2012), programs based on mindfulness and acceptance could be very valuable (Evans and Rothbart, 2008). These authors found that mindfulness-based stress reduction had large effects on stress, social anxiety, personal growth, and self-

acceptance. We can also confirm the successful application of the MISA program (as noted above), which incorporates such strategies and has been empirically shown to help HSP with these and other types of psychological problems. Moreover, individuals high in SPS have been shown to benefit more from psychological intervention (e.g., Nocentini et al, 2018; Pluess and Boniwell, 2015), whereby intervention approaches may not only be particularly vital for individuals high in SPS, given the association of SPS with psychopathology and stress-related problems, but also particularly effective. At a practical level, it would be useful to consider individuals with high SPS as being at risk of developing a whole range of psychological problems, especially those related to excessive worry or social anxiety. High SPS could be a kind of biological (according to some authors) or psychological vulnerability to the development of different psychological problems. On the other hand, social skills training could clearly be beneficial for many people with PAS.

We would also like to point out some limitations of the study. One of them was the low number of male university students when comparing people with high and low SPS. In the case of patients with SAD, this comparison could not be made for the same reason. Furthermore, some self-report measures applied to students were not applied to patients with SAD. Finally, some suggestions for future research would include the development of a scale to assess SPS with a stable factor structure, whether unifactorial or multifactorial. It would also be useful to clarify the basic and, above all, necessary characteristics that define a person with SPS, something that researchers currently lack. It would also be useful to establish effective cut-off points to determine when people can be considered to have high or low SPS.

5. Conclusions

In conclusion, the topic of the highly sensitive person (HSP) has become popular. However, it is not clear that SPS (core of the HSP) is a novel construct or that it is a variation of other previously studied temperament constructs, such as behavioral inhibition (Kagan et al, 1988) or introversion (Eysenck and Eysenck, 1968). That some people are born with a biological vulnerability to be more sensitive, excitable, inhibited or introverted does not seem questionable. It is to be expected that these vulnerabilities are diminished or enhanced by early experiences, especially the actions of caregivers. The belief that subsequent environmental factors will influence the extent to which these characteristics will become functional or dysfunctional behaviors is widely shared in the field of psychopathology. Anything that is aimed at better understanding human beings and helping them to solve their difficulties is welcome in the field of clinical psychology. But the area of HSP would benefit from more research, both at the level of assessment, the consolidation of the essential characteristics

of the construct and the development of intervention strategies. There are numerous questions and doubts that have been raised in this regard, to which researchers should provide answers in the coming years.

Availability of Data and Materials

Data and material are available from the main author.

Author Contributions

VC and IS designed the research study and performed part of it. MC, JH, OG, RG, AR, EC, HV, CP and RS performed part of the research study and provided advice about some parts of it. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

The study was carried out in accordance with the guidelines of the Declaration of Helsinki, and the protocol was approved by the Ethics Committee of University of Granada (approval number: 726/CEIH/2018). All patients or their families/legal guardians gave their informed consent for inclusion before they participated in the study.

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Conflict of Interest

The authors declare no conflict of interest. Vicente E. Caballo is serving as Editorial in Chief of this journal. Isabel C. Salazar is serving as one of the Editorial Board members of this journal. We declare that Vicente E. Caballo and Isabel C. Salazar had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to Dunia Garrido.

References

- Acevedo BP, Dattatri N, Marhenke R. Sensory processing sensitivity, memory and cognitive training with neurofeedback. *Behavioural Brain Research*. 2023; 452: 114601. <https://doi.org/10.1016/j.bbr.2023.114601>
- Ahadi B, Basharpour S. Relationship between sensory processing sensitivity, personality dimensions and mental health. *Journal of Applied Sciences*. 2010; 10: 570–574. <https://doi.org/10.3923/jas.2010.570.574>
- American Psychiatric Association (APA). *Diagnostic and statistical manual of mental disorders*. 3rd ed.- Revised (DSM-III-R). American Psychiatric Association: Washington, DC. 1987.
- American Psychiatric Association (APA). *Diagnostic and statistical manual of mental disorders*. 4th ed. (DSM-IV). American Psychiatric Association: Washington, DC. 1994.
- American Psychiatric Association (APA). *Diagnostic and statistical manual of mental disorders*. 5th ed. (DSM-5). American Psychiatric Association: Arlington, VA. 2013.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed.- Text Revision (DSM-5-TR). American Psychiatric Association: Washington, DC. 2022.
- Aron EN. *The highly sensitive person's workbook*. Broadway Books: New York. 1999.
- Aron EN. *Psychotherapy and the highly sensitive person: Improving outcomes for that minority of people who are the majority of clients*. Taylor & Francis: New York. 2010.
- Aron EN, Aron A. Sensory-processing sensitivity and its relation to introversion and emotionality. *Journal of Personality and Social Psychology*. 1997; 73: 345–368. <https://doi.org/10.1037//0022-3514.73.2.345>
- Aron EN, Aron A, Jagiellowicz J. Sensory processing sensitivity: a review in the light of the evolution of biological responsiveness. *Personality and Social Psychology Review*. 2012; 16: 262–282. <https://doi.org/10.1177/1088868311434213>
- Assary E, Oginni OA, Morneau-Vaillancourt G, Krebs G, Peel AJ, Palaologou E, et al. Genetics of environmental sensitivity and its association with variations in emotional problems, autistic traits, and wellbeing. *Molecular Psychiatry*. 2024; 29: 2438–2446. <https://doi.org/10.1038/s41380-024-02508-6>
- Bakker K, Moulding R. Sensory-processing sensitivity, dispositional mindfulness and negative psychological symptoms. *Personality and individual differences*. 2012; 53: 341–346. <https://doi.org/10.1016/j.paid.2012.04.006>
- Baryła-Matejczuk M, Poleszak W, Porzak R. Short Polish version of the Highly Sensitive Person Scale - exploring its multidimensional structure in a sample of emerging adults. *Current Issues in Personality Psychology*. 2021; 11: 72–86. <https://doi.org/10.5114/cipp.2021.107339>
- Beck AT, Steer RA, Brown G. *Manual for the Beck Depression Inventory-II*. Psychological Corporation: San Antonio, TX. 1996.
- Ben-Avi N, Almagor M, Engel-Yeger B. Sensory processing difficulties and interpersonal relationships in adults: an exploratory study. *Psychology*. 2012; 3: 70–77. <http://doi.org/10.4236/psych.2012.31012>
- Benham G. The highly sensitive person: Stress and physical symptom reports. *Personality and individual differences*. 2006; 40: 1433–1440. <https://doi.org/10.1016/j.paid.2005.11.021>

- Blach C, Egger JW. "The highly sensitive personality" - Report to research project high sensitivity. *Psychologische Medizin*. 2011; 22: 59–63. (In German)
- Bobrowska M, Liberska H. Polish adaptation of the Highly Sensitive Person Scale. *Przegląd Psychologiczny*. 2023; 66: 113–127. <https://doi.org/10.31648/przeglpsychologiczny.10129>
- Booth C, Standage H, Fox E. Sensory-processing sensitivity moderates the association between childhood experiences and adult life satisfaction. *Personality and Individual Differences*. 2015; 87: 24–29. <https://doi.org/10.1016/j.paid.2015.07.020>
- Bordarie J, Aguerre C, Bolteau L. Validation and study of psychometric properties of a French version of the highly sensitive person scale (HSPS-FR). *European Review of Applied Psychology*. 2022; 72: 100781. <https://doi.org/10.1016/j.erap.2022.100781>
- Brindle K, Moulding R, Bakker K, Nedeljkovic M. Is the relationship between sensory-processing sensitivity and negative affect mediated by emotional regulation? *Australian Journal of Psychology*. 2015; 67: 214–221. <https://doi.org/10.1111/ajpy.12084>
- Caballo VE, Fernández AL, Salazar IC. Personality disorders, fact or fiction? The dark future of their diagnosis. *Behavioral Psychology/Psicología Conductual*. 2024; 32: 5–40. <https://doi.org/10.51668/bp.8324101n>
- Caballo VE, Guillén JL, Salazar IC, Irturtia MJ. Personality styles and disorders: Psychometric characteristics of the "Exploratory Personality Questionnaire-III. *Behavioral Psychology/Psicología Conductual*. 2011; 19: 277–302. (In Spanish)
- Caballo VE, Salazar IC, Curtiss J, Gomez Araujo RB, Rossitto AM, Coello MF, et al. International application of the "Multidimensional Intervention for Social Anxiety" (MISA) program: I. Treatment effectiveness in patients with social anxiety. *Behavioral Psychology/Psicología Conductual*. 2021; 29: 517–547. <https://doi.org/10.51668/bp.8321301n>
- Caballo VE, Salazar IC, Equipo de Investigación CISO-A España. Development and validation of a new social skills assessment instrument: The Social Skills Assessment Questionnaire (SOSAQ). *Behavioral Psychology/Psicología Conductual*. 2017; 25: 5–24. (In Spanish)
- Caballo VE, Salazar IC, Garrido L, Irturtia MJ, Hofmann SG. Multidimensional Intervention for Social Anxiety (MISA) program: Therapist's Guide. VECA Foundation: Granada. 2023.
- Caballo VE, Salazar IC, Irturtia MJ, Arias B, Hofmann SG, CISO-A Research Team. The multidimensional nature and multicultural validity of a new measure of social anxiety: the Social Anxiety Questionnaire for Adults. *Behavior Therapy*. 2012; 43: 313–328. <https://doi.org/10.1016/j.beth.2011.07.001>
- Chacón A, Pérez-Chacón M, Borda-Mas M, Avargues-Navarro ML, López-Jiménez AM. Cross-Cultural Adaptation and Validation of the Highly Sensitive Person Scale to the Adult Spanish Population (HSPS-S). *Psychology Research and Behavior Management*. 2021; 14: 1041–1052. <https://doi.org/10.2147/PRBM.S321277>
- Cheng G, Zhang D, Ding F. Self-esteem and fear of negative evaluation as mediators between family socioeconomic status and social anxiety in Chinese emerging adults. *The International Journal of Social Psychiatry*. 2015; 61: 569–576. <https://doi.org/10.1177/0020764014565405>
- Costa-López B, Ruiz-Robledillo N, Moreno O, Albaladejo-Blázquez N, Hernandez C, Baryla-Matejczuk M, et al. Sensory processing sensitivity as a predictor of health-related quality of life outcomes via stress and sleep quality. *Scientific Reports*. 2024; 14: 22707. <https://doi.org/10.1038/s41598-024-72657-9>
- Counsell A, Furtado M, Iorio C, Anand L, Canzonieri A, Fine A, et al. Intolerance of uncertainty, social anxiety, and generalized anxiety: Differences by diagnosis and symptoms. *Psychiatry Research*. 2017; 252: 63–69. <https://doi.org/10.1016/j.psychres.2017.02.046>
- De Gucht V, Wilderjans TF, Garcia FK, Maes S. Dimensionality and validation of the Highly Sensitive Person Scale (HSPS) in a Dutch general population sample and two clinical samples. *Journal of Individual Differences*. 2023; 44: 205–213. <https://doi.org/10.1027/1614-0001/a000394>
- Ershova RV, Yarmotz EV, Koryagina TM, Semeniak IV, Shlyakhta DA, Tarnow E. A psychometric evaluation of the highly sensitive person scale: The components of sensory-processing sensitivity. *Electronic Journal of General Medicine*. 2018; 15: em96. <https://doi.org/10.29333/ejgm/100634>
- Evans DE, Rothbart MK. Temperamental sensitivity: two constructs or one? *Personality and Individual Differences*. 2008; 44: 108–118. <https://doi.org/10.1016/j.paid.2007.07.016>
- Eysenck HJ, Eysenck SBG. *Manual for the Eysenck Personality Inventory*. Educational and Industrial Testing Service: San Diego, CA. 1968.
- First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS. *Entrevista clínica estructurada para los trastornos de la personalidad del eje II del DSM-IV (Structured Clinical Interview for DSM-IV Axis II Personality Disorders)*. Masson: Barcelona. 1999.
- Fleming JS, Courtney BE. The dimensionality of self-esteem: II. Hierarchical facet model for revised measurement scales. *Journal of Personality and Social Psychology*. 1984; 46: 404–421. <https://doi.org/10.1037/0022-3514.46.2.404>
- Fresco DM, Moore MT, van Dulmen MHM, Segal ZV, Ma SH, Teasdale JD, et al. Initial psychometric properties of the experiences questionnaire: validation of a self-report measure of decentering. *Behavior Therapy*. 2007; 38: 234–246. <https://doi.org/10.1016/j.beth.2006.08.003>
- Frost RO, Marten P, Lahart CM, Rosenblate R. The dimensions of perfectionism. *Cognitive Therapy and Research*. 1990; 14: 449–468. <https://doi.org/10.1007/BF01172967>
- González MP, Bobes J, García M, Badía X, Luque A, Dal-Ré R. Assessing social phobia. The Spanish validation of the gold standard clinical scales: The LSAS and the SADS. *European Neuropsychopharmacology*. 1998; 8: 259–260. [https://doi.org/10.1016/S0924-977X\(98\)80471-9](https://doi.org/10.1016/S0924-977X(98)80471-9)

- Greven CU, Lionetti F, Booth C, Aron EN, Fox E, Schendan HE, et al. Sensory Processing Sensitivity in the context of Environmental Sensitivity: A critical review and development of research agenda. *Neuroscience and Biobehavioral Reviews*. 2019; 98: 287–305. <https://doi.org/10.1016/j.neubiorev.2019.01.009>
- Grimen H, Diseth Å. Sensory Processing Sensitivity: Factors of the Highly Sensitive Person Scale and Their relationships to Personality and Subjective Health Complaints. *Perceptual and Motor Skills*. 2016; 123: 637–653. <https://doi.org/10.1177/0031512516666114>
- Hinrichsen H, Clark DM. Anticipatory processing in social anxiety: two pilot studies. *Journal of Behavior Therapy and Experimental Psychiatry*. 2003; 34: 205–218. [https://doi.org/10.1016/S0005-7916\(03\)00050-8](https://doi.org/10.1016/S0005-7916(03)00050-8)
- Hofmann SG, Bitran S. Sensory-processing sensitivity in social anxiety disorder: relationship to harm avoidance and diagnostic subtypes. *Journal of Anxiety Disorders*. 2007; 21: 944–954. <https://doi.org/10.1016/j.janxdis.2006.12.003>
- Kagan J, Reznick JS, Snidman N. Biological bases of childhood shyness. *Science*. 1988; 240: 167–171. <https://doi.org/10.1126/science.3353713>
- Khosravani V, Ganji Z, Sharifi Bastan F, Samimi Ardestani SM, Amirinezhad A. Psychometric properties of the Highly Sensitive Person Scale and its relation to symptom dimensions in patients with obsessive-compulsive disorder. *Current Psychology*. 2021; 40: 2725–2734. <https://doi.org/10.1007/s12144-019-00212-1>
- Kinnealey M, Fuiet M. The relationship between sensory defensiveness, anxiety, depression and perception of pain in adults. *Occupational Therapy International*. 1999; 6: 195–206. <https://doi.org/10.1002/oti.97>
- Konrad S, Herzberg PY. Psychometric properties and validation of a German Highly Sensitive Person Scale (HSPS-G). *European Journal of Psychological Assessment*. 2019; 35: 364–378. <https://doi.org/10.1027/1015-5759/a000411>
- Liebowitz MR. Social phobia. *Modern Problems in Pharmacopsychiatry*. 1987; 22: 141–173. <https://doi.org/10.1159/000414022>
- Lionetti F, Aron A, Aron EN, Burns GL, Jagiellowicz J, Pluess M. Dandelions, tulips and orchids: evidence for the existence of low-sensitive, medium-sensitive and high-sensitive individuals. *Translational Psychiatry*. 2018; 8: 24. <https://doi.org/10.1038/s41398-017-0090-6>
- Lionetti F, Pastore M, Moscardino U, Nocentini A, Pluess K, Pluess M. Sensory processing sensitivity and its association with personality traits and affect: a meta-analysis. *Journal of Research in Personality*. 2019; 81: 138–152. <https://doi.org/10.1016/j.jrp.2019.05.013>
- Liss M, Mailloux J, Erchull MJ. The relationships between sensory processing sensitivity, alexithymia, autism, depression, and anxiety. *Personality and Individual Differences*. 2008; 45: 255–259. <https://doi.org/10.1016/j.paid.2008.04.009>
- May AK, Norris SA, Richter LM, Pitman MM. A psychometric evaluation of the Highly Sensitive Person Scale in ethnically and culturally heterogeneous South African samples. *Current Psychology*. 2020; 41: 4760–4774. <https://doi.org/10.1007/s12144-020-00988-7>
- Meredith PJ, Bailey KJ, Strong J, Rappel G. Adult Attachment, Sensory Processing, and Distress in Healthy Adults. *The American Journal of Occupational Therapy*. 2016; 70: 7001250010. <https://doi.org/10.5014/ajot.2016.017376>
- Meyer B, Ajchenbrenner M, Bowles DP. Sensory sensitivity, attachment experiences, and rejection responses among adults with borderline and avoidant features. *Journal of Personality Disorders*. 2005; 19: 641–658. <https://doi.org/10.1521/pedi.2005.19.6.641>
- Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*. 1990; 28: 487–495. [https://doi.org/10.1016/0005-7967\(90\)90135-6](https://doi.org/10.1016/0005-7967(90)90135-6)
- Neal JA, Edelmann RJ, Glachan M. Behavioural inhibition and symptoms of anxiety and depression: is there a specific relationship with social phobia? *The British Journal of Clinical Psychology*. 2002; 41: 361–374. <https://doi.org/10.1348/014466502760387489>
- Nocentini A, Menesini E, Pluess M. The personality trait of environmental sensitivity predicts children's positive response to school-based antibullying intervention. *Clinical Psychological Science*. 2018; 6: 848–859. <https://doi.org/10.1177/2167702618782194>
- Nuevo R, Montorio I, Ruiz MA. Application of the Penn State Worry Questionnaire (PSWQ) to elderly population. *Ansiedad y Estrés*. 2002; 8: 157–172. (In Spanish)
- Pfeiffer B, Kinnealey M. Treatment of sensory defensiveness in adults. *Occupational Therapy International*. 2003; 10: 175–184.
- Pluess M. Individual differences in environmental sensitivity. *Child Development Perspectives*. 2015; 9: 138–143. <https://doi.org/10.1111/cdep.12120>
- Pluess M, Belsky J. Differential susceptibility to parenting and quality child care. *Developmental Psychology*. 2010; 46: 379–390. <https://doi.org/10.1037/a0015203>
- Pluess M, Boniwell I. Sensory-processing sensitivity predicts treatment response to a school-based depression prevention program: evidence of vantage sensitivity. *Personality and Individual Differences*. 2015; 82: 40–45. <https://doi.org/10.1016/j.paid.2015.03.011>
- Pluess M, Assary E, Lionetti F, Lester KJ, Krapohl E, Aron EN, et al. Environmental sensitivity in children: Development of the Highly Sensitive Child Scale and identification of sensitivity groups. *Developmental Psychology*. 2018; 54: 51–70. <https://doi.org/10.1037/dev0000406>
- Redfearn RA, van Ittersum KW, Stenmark CK. The impact of sensory processing sensitivity on stress and burnout in nurses. *International Journal of Stress Management*. 2020; 27: 370–379. <https://doi.org/10.1037/str0000158>
- Rinn AN, Mullet DR, Jett N, Nyikos T. Sensory processing sensitivity among high-ability individuals: a psychometric evaluation of the Highly Sensitive

- Person Scale. *Roeper Review*. 2018; 40: 166–175. <https://doi.org/10.1080/02783193.2018.1466840>
- Rocha-Nieto LM, González Gutiérrez JL, López López A. Highly Sensitive Person Scale: adaptation and validation in the Colombian population. *Behavioral Psychology/Psicología Conductual*. 2025; 33: 37–56. (in press)
- Rosenberg M. *Society and the adolescent self-image*. Princeton University Press: Princeton, NJ. 1965.
- Rosenberg M, Schooler C, Schoenbach C, Rosenberg F. Global self-esteem and specific self-esteem: different concepts, different outcomes. *American Sociological Review*. 1995; 60: 141–156. <https://doi.org/10.2307/2096350>
- Salazar IC, Caballo VE, Arias VB, Curtiss J, Rossitto AM, Gómez Araujo RB, Herrera Puente JS, Coello MF, Gamarra O, Sanguino Andrés R, Hofmann SG, MISA Research Team. International application of the “Multidimensional Intervention for Social Anxiety” (MISA) program: II. Treatment effectiveness for social anxiety-related problems. *Behavioral Psychology/Psicología Conductual*. 2022; 30: 19–49. <https://doi.org/10.51668/bp.8322102n>
- Salazar IC, Roldán GM, Garrido L, Ramos-Navas Parejo JM. Assertiveness and its relationship to emotional problems and burnout in healthcare workers. *Behavioral Psychology/Psicología Conductual*. 2014; 22: 523–549. (In Spanish)
- Şengül-İnal G, Sümer N. Exploring the multidimensional structure of sensory processing sensitivity in Turkish samples. *Current Psychology*. 2017; 39: 194–206. <https://doi.org/10.1007/s12144-017-9751-0>
- Smith HL, Sriken J, Sherman M, Erford BT, Beck SK. Furthering the clinical and research utility of the Highly Sensitive Person Scale: cluster analysis of gender differences and risks for depression and anxiety. *Journal of Mental Health Counseling*. 2022; 44: 245–265. <https://doi.org/10.17744/mehc.44.3.04>
- Smolewska KA, McCabe SB, Woody EZ. A psychometric evaluation of the Highly Sensitive Person Scale: the components of sensory-processing sensitivity and their relation to the BIS/BAS and ‘Big Five’. *Personality and Individual Differences*. 2006; 40: 1269–1279. <https://doi.org/10.1016/j.paid.2005.09.022>
- Sobocko K, Zelenski JM. Trait sensory-processing sensitivity and subjective well-being: distinctive associations for different aspects of sensitivity. *Personality and Individual Differences*. 2015; 83: 44–49. <https://doi.org/10.1016/j.paid.2015.03.045>
- Stefan Lindsay J. *The highly sensitive teacher: Sensory-processing sensitivity, burnout, and self-efficacy in urban public school teachers* [doctoral dissertation]. UCLA: CA. 2017.
- Terra MB, Barros HMT, Stein AT, Figueira I, Athayde LD, Gonçalves MDS, et al. Internal consistency and factor structure of the Portuguese version of the Liebowitz Social Anxiety Scale among alcoholic patients. *Revista Brasileira De Psiquiatria*. 2006; 28: 265–269.
- Wolf M, van Doorn GS, Weissing FJ. Evolutionary emergence of responsive and unresponsive personalities. *Proceedings of the National Academy of Sciences of the United States of America*. 2008; 105: 15825–15830. <https://doi.org/10.1073/pnas.0805473105>
- World Health Organization. WHOQOL-BREF: Introduction, administration, scoring and generic version of the assessment (Field trial version). World Health Organization: Geneva. 1996.
- Wu X, Zhang R, Li X, Feng T, Yan N. The moderating role of sensory processing sensitivity in the link between stress and depression: A VBM study. *Neuropsychologia*. 2021; 150: 107704. <https://doi.org/10.1016/j.neuropsychologia.2020.107704>
- Yano K, Kase T, Oishi K. The associations between sensory processing sensitivity and the Big Five personality traits in a Japanese sample. *Journal of Individual Differences*. 2021; 42: 84–90. <https://doi.org/10.1027/1614-0001/a000332>