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Highly sensitive persons (HSPs) and the situation of foreign language testing

We carried out a preliminary study exploring the influence of sensory processing sensitivity (SPS) on the situation of foreign language testing. Initially, SPS levels were determined for 103 English philology students. Then, the participants reported their perceived stress levels during language tests and their preferences for test form (onsite vs. online) and type (written vs. oral). Subsequently, 50 students completed a written interview, expressing their opinions on factors that, beyond their knowledge and skills, had influenced their test performance. The data analysis indicated that oral language exams were generally perceived as more stressful by all participants, regardless of their SPS levels. Regarding test type and form preferences, no statistically significant differences were found between the three distinguished groups. In turn, thematic analysis of the written interviews suggests that, in testing situations, highly sensitive students reported to be especially affected by sensory disruptors.

Key words: foreign language learning, foreign language testing, highly sensitive persons (HSPs), sensory processing sensitivity (SPS), sensory processing sensitivity theory

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Introduction

The influence of individual learner differences on the process of foreign language acquisition and use has been extensively studied by both psychologists and applied linguists (cf. Li et al., 2022). Among others, personality has garnered significant attention among researchers, who focus on explaining how various personality dimensions, including, for example, extraversion and openness to experience, influence different aspects of language learning (e.g., Angelovska et al., 2021; Pourfeiz, 2015; Robinson et al., 1994). Already at the end of the 1950s, notable researchers such as Gardner and Lambert (1959) explored the influence of motivation, attitudes, and self-confidence on second language acquisition. Their pioneering work laid the foundation for further studies in the field of psycholinguistics. Still, as the understanding of human psychology is constantly evolving, the concept of personality is subject to ongoing refinement and redefinition, opening new possibilities for researchers exploring the role of this variable in different areas of human life (cf. Roberts & Yoon, 2022).

Aron and Aron's (1997a) sensory processing sensitivity (SPS) theory sheds new light on our perception of personality and can be, therefore, integrated into the exploration of individual variables and their role in foreign language learning. In her works, Aron (cf. Aron, 1996; Aron & Aron, 1997a; Aron et al., 2012) suggested that a subset of individuals possess a heightened sensitivity to external stimuli which can profoundly impact their experiences, emotions, and behaviors.

The SPS trait, whose high levels characterize so-called highly sensitive persons (HSPs), has been extensively studied in a number of research fields, including medical and health sciences (e.g., Benham, 2006; Costa-López et al., 2021), biological sciences (Sih & Bell, 2008), economics (Harms et al., 2019), or education in general, with particular emphasis being placed on special education and school-related problems (Kibe et al., 2020; Pluess & Boniwell, 2015). Still, to the author's knowledge, there are no studies exploring the role of SPS as defined by Aron (1996) in the processes guiding foreign language learning and teaching.

In the context of foreign language acquisition, on the one hand, Aron (1996) herself suggested that, due to their unique capabilities, HSPs may learn languages better. For instance, HSPs have been recognized as more analytical and attentive than less sensitive individuals (cf. Cater, 2016), traits commonly attributed to so-called good language learners (cf. Zeng, 2018). Furthermore, the heightened emotional reactivity characteristic for HSPs "is helpful for memory and learning, through providing vital feedback that facilitates introspection, and helps to guide behavior in both novel and similar situations" (Cater, 2016, p. 25). On the other hand, although advantageous in some scenarios, increased emotional reactivity (cf. Baumeister et al., 2007; Zeff, 2004) may also lead to impaired stress resilience and a tendency to get overwhelmed easily. Similarly, Aron (1996) underscored the link between high SPS and heightened stress reactions, influencing one's performance in challenging and emotional situations, potentially extending to

various testing procedures and public speeches. In these instances, HSPs may encounter communication difficulties and, in certain instances, even develop social phobia (cf. Aron, 1996; Hofmann & Bitran, 2006).

Despite the associations mentioned above, the limited literature on the potential influence of SPS on the process of foreign language learning, use, and progress evaluation indicates that this connection has not been directly examined. The author believes that investigating the impact of high SPS on the field of foreign language education can contribute to a better understanding of the role of this trait in this process. This, in turn, paves the way for the development of more personalized and effective learning, teaching, and assessment strategies.

Recognizing the need to address this research gap, the aim of this study is to explore the potential influence of individual SPS level on the possibly most stressful element of formal language education, that is, the testing situation. (cf. Bueno, 2021). Specifically, a group of experienced language learners, having experienced many testing situations, underwent SPS level assessment. Subsequently, they were queried about their preferences for test form and type, self-reported stress levels during language evaluation, as well as their overall experience related to language testing procedures. This study contributes to the understanding of factors influencing testing situations in the case of highly sensitive (language) learners.

Literature Overview

Defining Sensory Processing Sensitivity

As pointed out by Turjeman-Levi and Kluger (2022, p. 1), "[a]ll living organisms respond to variations in their physical environment through sensors" detecting changes in their physical surroundings (e.g., the ones related to sound or light). The ability to detect such changes in the environment is influenced by individual, neurobiologically based differences which are examined in the SPS theory, proposed by Aron and Aron (1997a).

The SPS theory suggests that there are individual differences in the capacity to process external stimuli resulting from the diverse levels of SPS (Turjeman-Levi & Kluger, 2022). As pointed out by Greven et al. (2019), SPS is a commonly occurring, genetically inheritable and evolutionarily preserved characteristic that captures variations in individuals' sensitivity to both adverse and favorable environmental conditions. The trait has been recognized as being related to temperament and personality traits which likewise reflect one's sensitivity to environments, including introversion, neuroticism, and openness to experience (Greven et al., 2019). Similarly, Smolewska et al. (2006) provided support for Aron and Aron's (1997) assertion that associates SPS with the personality traits of openness and introversion, with only approximately 30% of HSPs identified as extraverted. Still, "even though SPS overlaps with some personality traits and affect (Lionetti et al., 2018, Pluess et al., 2018), it is not fully captured by any of these, or indeed

by their combined effects" (Lionetti et al., 2019, p. 138). Consequently, it should be regarded as an autonomous and distinct trait.

High levels of SPS can be explained from an evolutionary perspective as an adaptive trait that has persisted in certain individuals or populations. It has been estimated that around 20-35% of a given human population consists of HSPs (cf. Aron et al., 2012; May et al., 2020).

People high in SPS, called HSPs by Aron (2006), notice subtleties and nuances in the environment that usually escape the attention of the individuals low in this trait. On the other hand, as underlined by Turjeman-Levi and Kluger (2022), due to the unique setup of their nervous system, HSPs possess a reduced tolerance for sensory stimulation compared to those with lower levels of SPS and are consequently more likely to experience overarousal and to be overwhelmed. As a result, they often struggle to process the stimuli what may lead even to some intense physical reactions (such as rapid heart rate, sweating etc.), which increases their overarousal even further. Due to this potential for overarousal, HSPs tend to exhibit a greater degree of caution and deliberation when formulating their responses to the external environment (cf. Turjeman-Levi & Kluger, 2022).

High Sensitivity and Foreign Language Learning

Although, as hinted above, there exists a visible research gap when it comes to exploring the potential influence of high sensitivity on the process of foreign language learning, the findings up to date point to some potential links between high levels of SPS and language learning. First of all, some research (cf. Acevedo et al. 2014; Schaefer, 2022) suggests differences in HSPs' brain structure and functioning compared to those with lower sensitivity. For example, in her study exploring differences in brain activation between HSPs and low-sensitivity individuals, Acevedo et al. (2014) discovered that the brain regions showing activity in HSPs were linked to attention and planning for action, including imitation learning, intuition, and the ability to comprehend other people's goals, motives, and intentions. These findings suggest an enhanced degree of metacognitive awareness among HSPs (cf. Cater, 2016). In the context of foreign language education, metacognitive awareness allows for better self-regulation, language learning planning, and problem-solving (cf. Chamot, 2018; Dörnyei, 2005). It guides students' strategy choice and is often linked with increased autonomy, motivation, and dedication (cf. Wang et al., 2023).

Furthermore, in the same study, Acevedo et al. (2014, p. 590) discovered a link between high SPS levels and levels of activation in the middle temporal gyrus, which is "described as a 'semantic hub' for language, visual, and auditory processing." Consequently, HSPs have greater capacity for processing incoming information and might be more attuned to the nuances of language, such as tone of voice and intonation. Moreover, the enhanced ability for information processing aligns with a tendency to "pause and check" wherein individuals carefully observe

and analyze before taking actions (Cater, 2016). Although time consuming, this strategy is believed to result in a deeper understanding gained from the experience and its application to future situations (Acevedo et al., 2014).

Conversely, HSPs' inclination to process the incoming stimulus more deeply (Aron & Aron, 1997) may be perceived in the educational context "as an apparent lack of understanding of new information, or falling behind with work. This can lead to further levels of overwhelm that can impact on all areas of health and well-being" (Cater, 2016, p. 26).

These general observations about HSPs underscore the importance of considering the influence of SPS on the broadly defined process of foreign language learning. As shown in the following section, the necessity for further research becomes especially apparent when examining the context of evaluation procedures where students are confronted with stress-inducing tasks demanding substantial mental effort within strict time constraints.

Sensory Processing Sensitivity and the Situation of Testing

Situations involving evaluation are frequently associated with heightened levels of stress and test anxiety (cf. Heissel et al., 2021; Horwitz et al., 1986; Parsons, 2008), which can have adverse effects on students' cognitive performance (cf. Hembree, 1988). Consequently, the necessity to engage in such evaluation procedures prompts students to develop different coping mechanisms and strategies, including self-regulation ones (cf. Dörnyei, 2005; Parsons, 2008). One's ability to adapt and successfully deal with stressful situations relies on "effective responses to environmental challenges and ultimate resistance to the deleterious effects of stress," factors that are intricately linked to one's genetic predispositions and various environmental elements in which an individual functions (Wu et al., 2015).

Correspondingly, research (cf. Aron et al. 2012; Turjeman-Levi & Kluger, 2022) suggests that HSPs, due to their unique neurological setups, are genetically more vulnerable to the effects of stress and, therefore, may experience its physical symptoms more severely. On top of that, Boterberg and Warreyn (2016) underlined that SPS may be associated with impaired emotional regulation. Given that tests and exams have been shown to induce elevated levels of negative emotions (cf. Liu, et al., 2021), individuals with high levels of SPS may experience a greater impact on their performance in contrast to their less sensitive counterparts. Additionally, being evaluated is often linked to receiving criticism, which as a face-threatening act, may lead to emotional losses and an increased need to deal with them (cf. Hartley, 1998).

On the other hand, studies have also shown that HSPs tend to display greater activity in regions of the brain involved in processing emotions (cf. Acevedo et al, 2014). Consequently, HSPs often have a greater awareness of their own emotions and the emotions of others, which can potentially contribute to a better understanding of the social and emotional aspects of language use. They may be more

adept at reading facial expressions, body language, and other nonverbal cues that convey meaning beyond the words being spoken (cf. Fernández, 2018; Turjeman-Levi & Kluger, 2022). Consequently, it may be hypothesized that HSPs are more easily affected by the social aspects of the testing environment, that is, the behavior of the examiner, whose impact on one's test performance has been widely recognized in research (cf. Chambers et al., 2012), and/or of other students taking the test.

Performance on tests can also be affected by the testing environment and various situation-specific factors, including location, time of day, room temperature, noise, lighting, and so forth (cf. Ronsse & Wang, 2013; Weir & May, 1988; Zivin et al., 2020). Thus, as HSPs are by definition more sensitive to external stimuli, they may struggle more to focus and not to be distracted (cf. e.g., Aron, 2006). Specific type of distractions may also operate during online classes and examinations, which have become increasingly popular in the aftermaths of the COVID-19 pandemic. As underlined by Kostaki and Karayianni (2002), in home-based learning environments, where distractions such as family members, pets, and access to devices like mobile phones are common, divided attention can significantly hinder students' ability to process information and perform effectively, leading to a noticeable drop in academic outcomes, as also observed in studies like Blasiman et al. (2018).

In addition to the distinction between online and onsite forms of evaluation, other features of a test can also influence one's performance, often contingent on individual preferences and previous experiences. These factors encompass the test taker's familiarity and personal preferences regarding the method of responding and/or the presentation of tasks (e.g., written vs. oral tests, close-ended vs. open-ended questions; cf. Bachman & Palmer, 2010; Birgili, 2014; Chambers et al., 2012; Huxham et al., 2012; Sparfeldt et al., 2013; van de Watering, 2008). For example, as pointed out by van de Watering et al. (2008, p. 655), "[w]ritten assessments, especially the multiple-choice format, are often preferred because students think they reduce stress and test anxiety and are easy to prepare for and to take (Traub and McRury 1990)". These factors seem to gain particular significance when examining their potential influences on the test performance of HSP students. For instance, given their more reflective and analytic nature (cf. Acevedo et al, 2014; Acevedo, 2020), HSP students may possibly exhibit preferences for certain test formats and question types. On the one hand, some HSP students may potentially feel more comfortable expressing themselves in writing, allowing for careful organization of their thoughts. On the other hand, other HSPs may demonstrate preferences for more-personalized oral exams, particularly in settings conducive to their sensory needs.

Moreover, due to their increased attentiveness and analytic skills (cf. Cater, 2016), HSP students may be more prone to overthinking or second-guessing their answers on a test or exam. This can be especially problematic when time constraints are involved, as they may spend too much time analyzing the situation, pondering each question too long or considering multiple possible answers. As po-

inted out by Boterberg and Warreyn (2016, p. 80), HSPs "would respond more to cues in the environment by comparing them to previous experiences with similar cues. This may result in taking more time to observe and react slower whereby they seem less prone to act when confronted with a new situation and have more aversion towards risk-taking."

To sum up, various characteristics of test takers and their consequent individual preferences have already been recognized as factors influencing students' performance (cf. Bachman & Palmer, 2010). Nevertheless, exploring the potential link between SPS and the testing situation may contribute to a better understanding of these intricate relationships. Due to their innate characteristics, HSP students may experience testing situations even more intensely than their less sensitive peers. On the other hand, in favorable testing conditions, some of capabilities linked to high sensitivity may potentially work to their advantage. For example, as HSPs are more reflective and introspective, they may be more aware of the factors which influence their performance (cf. Aron, 2006). Furthermore, in a supporting environment, their great capacity for processing incoming information can be useful. Consequently, in testing situations, high SPS may be both a beneficial and detrimental trait.

Method

Research Aim and Questions

Recognizing both strengths and limitations of HSP students, the aim of the current study was to explore the potential influence of high SPS on the language testing situation. Consequently, the following research questions were formulated:

RQ1: Is there any difference between stress levels reported by students with distinct levels of SPS in a foreign language testing situation?

RQ2: Are there any differences between language test type (oral vs. written) and form (online vs. onsite) preferences among students with different levels of SPS?

RQ 3: Do HSP language learners differ in their perception of factors which influence their performance in language tests/exams in comparison to low SPS individuals?

Participants

The study employed convenience sampling as the sampling method. In order to answer the above questions, 103 second-year students of English Philology at a Polish state university were invited to participate in the study. They represented a group of experienced and advanced English language learners with the assumed English level of B2+, as specified in the curriculum for this stage of education at this specific university. Their age varied from 18 to 24, with 46 participants being 20 years old (constituting 45% of the sample) and 33 individuals aged 21 (32% of the sample). Seventy-seven participants were female, accounting for 75% of the

sample, while the remaining 19 male students represented 18% of the sample. This uneven gender distribution may be attributed to their field of studies, which, in the Polish educational context, is dominated by women.

Tools

The data was collected in April 2023. Prior to participation, all the individuals were informed about the aim and voluntary character of the study as well as their ability to withdraw their participation at any time. During the research procedure, three different tools were used, namely, (a) the Highly Sensitive Person Scale (Aron, 1997b; Baryła-Matejczuk et al., 2022), (b) a questionnaire containing two close-ended and two Likert-scale based questions, and (c) a questionnaire with two open-ended, interview-like questions. All the tools were in the participants' native language, that is, Polish.

The Highly Sensitive Person Scale and the second questionnaire were administered during regular classes, while the link to the third questionnaire was sent to the students' group email address – in this way, the participants were given ample time and comfortable conditions to participate in this more time-consuming part of the study.

Procedure and Analysis

To assure anonymity, all the participants were asked to invent and memorize a nickname which was also later used in the subsequent study stages. In this way, it was possible to link different forms with one particular participant. Initially, in order to check their level of SPS, all of the participants completed the Polish short version of the Highly Sensitive Person Scale designed by Aron (1997b; Baryła-Matejczuk et al., 2022) for students aged 12-25 years. Consequently, three groups of students were identified:

- 1) 25 highly sensitive students, which constituted 24% of the sample;
- 2) 44 students (43%) with moderate awareness of sensory stimulation; and
- 3) 34 individuals (33%) with low levels of sensitivity.

The Highly Sensitive Person Scale results seem to reflect the usual distribution of SPS levels in a human society, where typically 20-30% of individuals are classified as high, 40% as average, and 30% as low (cf. Lionetti et al., 2018).

In the second questionnaire, basic demographic information was collected, and the participants were asked two Likert questions about their perceived levels of stress during oral and written exams, and two close-ended questions about their general preferences concerning the form (onsite vs. online) and type (written vs. oral) of language tests or exams (see the Appendix).

Statistical analysis for the data from these four questions was performed with the IBM SPSS Statistics 28.0 software. To determine differences in stress scores

dependent on the degree of sensitivity, a Kruskal-Wallis H-test analysis was conducted. As a post hoc test, the Dunn test with Bonferroni significance correction was employed. The Fisher-Freeman-Halton test was used to ascertain the association between exam preference and sensitivity level. The significance level was set at $p = .05$.

Finally, during the third stage, only 50 participants out of the initial 103 responded to the author's request sent to their group email address and completed the final questionnaire. Still, as the data collected during this stage was gathered predominantly for qualitative analysis, the sample was sufficient. Out of the 50 participants, 13 had high SPS levels (which constituted 26% of the sample), 22 (44%) had average levels of SPS, and 15 (30%) had low SPS levels. The questionnaire contained the following prompts:

1. Apart from your knowledge and skill, what other factors influence, in your opinion, your written language test/exam results?
2. Apart from your knowledge and skill, what other factors influence, in your opinion, your oral language test/exam results?

The questions were formulated straightforwardly, and their main aim was to gain insight into students' perception of the role of various factors influencing, in their opinion, the results of their language tests. For further analysis, the 13 answers given by all the identified HSP students were taken into consideration and 13 answers by students with the lowest scores on the Highly Sensitive Person Scale were selected to ensure a comparable number of answers from both groups. Then, a qualitative analysis of the responses was performed by means of the Nvivo 10 software to facilitate the organization and coding of the data. Specifically, the data were analyzed in accordance with the rules of thematic analysis, which allowed for identification of common themes and consequent deeper understanding of participants' viewpoints and beliefs (cf. Braun & Clarke, 2006). The responses given to both prompts for each participant were treated as a unit and saved in separate files¹. The author personally engaged in multiple readings of these units, initially focusing on identification of patterns within the answers provided by low SPS students and subsequently examining those from high SPS ones. Through a systematic process of comparison, identification, and coding of these patterns, six main topics were discerned, which were brought up by both high and low SPS participants. These include: (a) features and organization of the test/exam, (b) external disruptors/physical surrounding, (c) experienced stress, (d) the person of the teacher/examiner, (e) physical wellbeing, and (f) other students taking the exam/test.

¹ Due to the limited and repetitive nature of the responses to the prompts for some participants (many provided answers such as "As above" or simply copied earlier responses when addressing the second prompt), these were consolidated as a single answer for each participant. Consequently, the distinction between the two forms of the exam/test was not considered in the later analysis.

Results

The mean reported stress level for all the participants was 3.6 for written exams and 4.57 for oral exams. The descriptive statistics for stress levels, taking into account the participants' SPS level, during written and oral language exams/tests are presented in the Table 1.

Then, the Kruskal-Wallis H test was used to investigate whether the stress levels related to the written exams and tests varied depending on SPS. The analysis revealed statistically significant differences, $\chi^2(2) = 7.72$, $p = .021$, $\eta^2 < 0.01$.

The exact post hoc Dunn test with Bonferroni significance correction analysis reveals that the participants with low SPS reported less stress than the average SPS participants ($p = .034$). No statistically significant differences were observed among the other groups ($p > .05$). Figure 1 shows the average ranks and the results of the post hoc test.

The Kruskal-Wallis H test was also used to investigate whether the stress le-

Table 1. *Descriptive Statistics for Stress Level Based on Degree of Sensitivity*

Stress	Sensitivity level	Me	IQR	Min.	Max.
Written exams/tests	Low	3.0	1.0	1	5
	Moderate	4.0	1.0	2	5
	High	4.0	2.0	2	5
Oral exams/tests	Low	5.0	1.5	2	5
	Moderate	5.0	0.0	1	5
	High	5.0	0.75	3	5

vels related to the oral exams and tests varied depending on the degree of SPS. The test did not reveal any statistically significant differences in perceived stress triggered by oral exams/tests in relation to sensitivity level, $\chi^2(2) = 4.10$; $p = .129$; $\eta^2 < 0.01$. High, low, and moderate SPS participants experienced a similar degree of stress. Figure 2 shows average ranks and the results of the post hoc analysis.

Table 2 shows the frequency analysis combined with the results of the exact Fisher-Freeman-Halton test to identify relationships between SPS levels and preferences towards oral versus written examinations. The analysis did not reveal statistically significant relationships between the variables. Regardless of their SPS level, most participants tended to prefer written exams/tests. Approximately 18-25% of the respondents in both groups expressed an opinion that their preference towards the examination format depends on a particular exam/test. Table 3 shows corresponding analyses to determine the association between SPS level and preference towards the online/offline exam format. No statistically significant relationship between the variables was found. The preference for an online or onsite form depended on the type of exam according to between 43 and 67% of respondents in the groups classified by SPS levels. In the low and moderate SPS

Figure 1. *Average Ranks with Estimated Corrected Significance of Post Hoc Analysis for Stress During Written Exams/Tests by Sensory Processing Sensitivity*

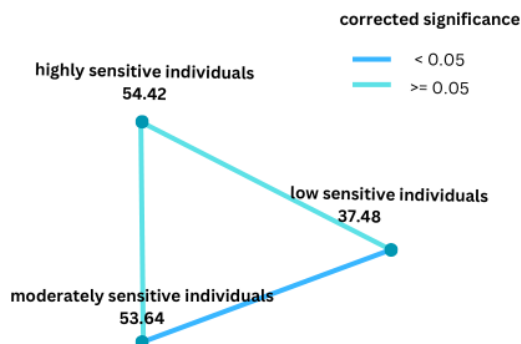
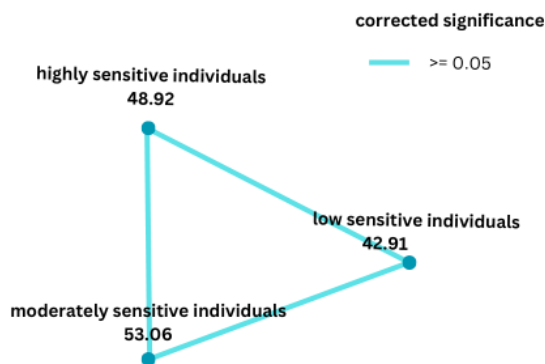


Figure 2. *Average Ranks with Estimated Corrected Significance of Post Hoc Analysis for Stress During Oral Exams/Tests by Sensory Processing Sensitivity*



groups, about half of the respondents said they would prefer an online exam, whereas in the HSP group, their percentage was 29.2%.

Furthermore, the thematic analysis of the answers given by both high and low SPS participants led to inductive identification of six major themes referring to aspects influencing students' scores on tests and exams. These included: (a) features and organization of the test/exam itself, (b) external disruptors/physical surroundings, (c) experienced stress, (d) the person of the teacher/examiner, (e) physical wellbeing, and (f) other students taking the test.

Table 4 shows examples of answers in a given theme together with the number of high and low SPS participants referring to it. As the number of participants providing answers at this stage of the study was insufficient for quantitative analysis, the reported numbers are presented solely for informative purposes. They may serve as preliminary insights and suggest directions for further studies.

Table 2. *Frequencies and Exact Fisher-Freeman-Halton Test for the Relationship Between Sensory Processing Sensitivity and Preference Towards Written Versus Oral Exams*

Preference	Low		Moderate		High		χ^2	p	V_c
	n	%	n	%	n	%			
Written exams/tests	19	65.5	34	77.3	18	75.0	3.22	.521	0.14
Oral exams/tests	3	10.3	2	4.5	0	0			
Depends on exam/test	7	24.1	8	18.2	6	25.0			

Table 3. *Frequencies and Exact Fisher-Freeman-Halton Test for the Relationship Between Sensory Processing Sensitivity and Preference Towards Online Versus Offline Exams*

Preference	Low		Moderate		High		χ^2	p	V_c
	n	%	n	%	n	%			
Online exams	14	48.3	23	52.3	7	29.2	4.87	.252	0.16
Offline exams/tests	0	0	2	4.5	1	4.2			
Depends on exam/test	15	51.7	19	43.2	16	66.7			

Table 4. *Examples of the Participants' Answers According to the Six Identified Themes Together With the Specification of Number of Students Who Referred to a Given Theme*

Identified theme	Quote	Number of HS students referring to the theme	Number of LS students referring to the theme
Features and organization of the test/exam itself	S15: If there is not enough time, it is very likely that I will have to skip some tasks or do them without proper attention.	7	7
External disruptors/ physical surroundings	S4: [My final exam/test score is influenced by] my inability to focus because of different sounds, smells etc.	9	3
Experienced stress	S42: [My final exam/test score is influenced] definitely by stress and the fact of being evaluated at a given moment.	10	10
The person of the teacher/ examiner	S27: If the instructor makes unpleasant remarks or has a rather "cold" attitude, it causes more stress for the test taker, which in turn translates into a worse result.	6	4
Physical wellbeing	S14: Fatigue, getting enough sleep or being full also affects my score. I think better when my stomach is full.	5	6
Other students taking the test/exam	S39: [My final exam/test score is influenced by] my partner's level – sometimes during the oral exam, I start to stress about my partner's result, and I worry that because of their "worse" level, I am not able to start discussing topics on which I can comment a lot (...). I also don't want to dominate the conversation.	3	5

The number of students referring to a given theme was rather comparable, with the exception of the influence of external disruptors present in the exam surroundings – this aspect was mentioned by 69% of high SPS participants and 20% of low SPS ones. Due to this discrepancy, the further presentation of qualitative data focuses mostly on this particular theme. The themes are illustrated by the interview quotations by high SPS students.

In their answers, most of the high SPS participants pointed to the distracting nature of sounds (others talking and/or leaving the room earlier, the teacher/examiner walking and clinking heels, background noises coming from the street etc.). For some of the participants, distracting sounds were not only influencing their concentration, but also constituted sources of additional stress, as mentioned by Student 7:

S7: Sounds outside the room, such as lecturers or students who are talking in front of the room, can also affect [my final result]. It's really stressful for me and I start to think that I should be done already, everyone's done, but not me.

Interestingly, in a testing situation, even silence can be disruptive, as it gives background to some natural sounds emitted by human bodies. This aspect was mentioned by Student 48:

S48: ...when it is too quiet. It can also be disruptive. Often, someone may become stressed if there is complete silence and they can hear sniffles or stomach rumbling.

What is more, one of the high SPS study participants referred to the presence of students with special needs:

S9: [What influences my score apart from my knowledge and skills] is external stimuli, such as passing trams or the sound of heels clicking, as well as students with special needs who may cause distractions during the exam. This can also be disruptive while writing.

The issue was addressed in a very general way. Therefore, it is difficult to identify the potential reason why such students may constitute sources of disturbance. It may be hypothesized that some of them may need additional assistance from the examiner or they themselves may demonstrate some distracting behaviors.

Moreover, the answers given by the high SPS participants pointed to three main sources of sound-related disruptors, including (a) the environment in which the exam is taking place (S9: "external stimuli such as incoming trams or the clicking of heels"); (b) other people participating in a test or exam, including the teacher/examiner and other students (S29: "people leaving the room earlier, followed by rustling and various other noises that accompany it"), and (c) the individual taking the test themselves (S17: "I can quickly lose concentration or become stressed by noise, or even by the rumbling in my stomach.").

Apart from different noises, some high SPS students also mentioned other

sense-related disruptors, including smells, temperature in the room, or tactile discomfort coming from the seat occupied or the formal clothes worn.

The disruptive nature of external stimuli may be associated with another theme identified, namely, stress experienced in a testing situation. This specific issue was mentioned most often by both high and low SPS students. The detrimental effect of stress was described, for example, by high SPS Student 7, who pointed to its direct influence on their performance:

S7: Stress sometimes makes me read the questions mindlessly during the exam and answer quickly, because I think I know the answer. Sometimes it happens that after the exam I remember about it, and only then it turns out that something else was required in the task.

Apart from emotional wellbeing, the physical condition of a learner also plays a role in a testing situation. One of the high SPS participants pointed to the link between stress and physical symptoms experienced during a language test/exam:

S39: Sometimes my stomach hurts from stress and I focus on the pain. And it's harder for me to concentrate and recall some information.

In turn, another learner mentioned the discomfort resulting from the necessity to take a test during menstruation:

S9: [What influences my final score] is my medical condition; for example, the often-ignored problem of working during menstrual cramps.

The next identified theme refers to the issue of a test/exam features and organization. The participants mentioned both aspects related to written (e.g., quality of recordings) and oral tests/exams. When it comes to the latter, both high and low SPS students complained about the random nature of topics on which they have to comment during their oral proficiency exams:

S29: [What influences my final score] is the belief that I'll get a topic that requires using vocabulary I don't know. Additionally, there are questions that are difficult to find a sensible answer to in my native language, let alone in the language I am still learning despite studying it.

Additionally, issues like insufficient time, the requirement to refer to a specific number of aspects during an oral exam, and the formality of the testing situation were also described.

Finally, the last two themes point to the influential role of people present during a test/exam, namely the examiner/teacher and other students. They were identified as the ones causing disruptions and stress. As shown in Table 4, the behavior and attitude of the examiner may cause anxiety and influence one's performance. Additionally, as oral exams are usually taken in pairs, some of the participants stated that the level and behavior of their partner are likely to influence their performance and strategies adapted (see Table 4).

Discussion

The following section offers answers to the research questions posed.

RQ1: Is there any difference between stress levels reported by students with distinct levels of SPS in a foreign language testing situation?

The quantitative analysis of the gathered data revealed that oral exams/tests were generally perceived as a source of heightened stress compared to their written counterparts. This observation aligns with findings from other studies, indicating a distinct psychological impact associated with the oral examination format (e.g., Huxham et al., 2012). The increased stress experienced during oral exams can be ascribed to their inherent attributes, encompassing factors such as the requirement of public speaking, real-time interaction, and the potential experience of test anxiety (Horwitz et al., 1986; Li et al., 2021).

Furthermore, a difference in the declared stress levels experienced during written exams/test among students with different SPS levels was observed. Specifically, low SPS individuals reported the lowest levels of stress (see Table 1), suggesting a potential resilience of this group to the pressures associated with written exams, possibly linked to their lower emotional reactivity (see Baumeister et al., 2007; Zeff, 2004). Nevertheless, the only statistically significant difference was observed between low and moderate SPS participants, indicating that those with average SPS reported experiencing higher stress levels in written exam situations (see Table 1). Since this difference was not observed between other groups of participants, further research relying on alternative, more reliable tools for assessing stress is needed.

In contrast, sensitivity levels did not significantly impact reported stress levels in the context of oral exams/tests, indicating a more uniform stress response across sensitivity categories in the context of oral assessments (see Table 1).

RQ2: Are there any differences between language test type (oral vs. written) and form (online vs. onsite) preferences among students with different levels of SPS?

The majority of the study participants, irrespective of their SPS levels, favored written exams (see Table 2). This preference aligns with the aforementioned observation, as this exam format was also perceived as less stressful.

Additionally, it was noted that a higher percentage of participants in the low and moderate SPS groups expressed a preference for online exams compared to the HSP cohort (see Table 3). This divergence in perspectives may be linked to the potential existence of additional disruptors in online testing scenarios, not present in the usually better controlled and predictable classroom environments (cf. Blasi-man, 2018; Kostaki & Karayianni, 2022). While the difference was not statistically significant, it suggests the need for further examination of a potential connection between sensitivity levels and attitudes towards different forms of assessments.

To sum up, it was observed that the level of SPS did not directly translate into preferences for specific forms or types of language exams. It may be hypothesi-

zed that students' preferences in this area, as hinted in previous research (Traub & McRury, 1990; van de Watering, 2008), may be influenced by a combination of different personal variations, including gender, learning style, personality, cognitive abilities, beliefs, and previous testing-related experience. Additionally, for instance, due to their distinct learning histories, HSP students may differ when it comes to the degree of development of various coping strategies which would allow them to manage testing situations effectively (Dörnyei, 2005; Parsons, 2008). These factors can blur the nature of relationships between one's SPS levels and their exam preferences.

RQ 3: Do HSP language learners differ in their perception of factors which influence their performance in language tests/exams in comparison to low SPS individuals?

The results of the thematic analysis suggest that both high and low SPS students have similar perceptions of factors which, apart from knowledge and skills, influence their language exam/test scores. The six identified types of influences (see Table 4) are consistent with existing research, exploring factors which indirectly influence (language) testing situations (Bachamn & Palmer, 2010; Ronsse & Wang, 2013; van de Watering, 2008; Zivin et al., 2020).

The analysis also showed that, among these factors, the stress-inducing character of language tests is the one most often mentioned by both high and low SPS students (see Table 4). This finding aligns with current research, emphasizing the widespread impact of emotional factors on how language assessments are perceived (cf. Heissel et al., 2021).

Finally, it was also noted that HSP language learners referred to the disruptive influence of external stimuli more frequently than their low SPS peers (see Table 4). This observation reflects the typical neurological profile of HS individuals, who, due to their more reactive nervous systems (Aron, 2006; Turjeman-Levi & Kluger, 2022), may be more easily affected by their surroundings while taking a test. Among various sense-related disruptors reported, sound-related ones emerged as especially problematic for HS students, potentially influencing their performance during language tests and exams.

Conclusions

As suggested by empirical results, high SPS can potentially have both positive and negative effects on the process of foreign language education, including an individual's performance on tests and exams. Given that high SPS is a personality trait rather than a disorder, the recognition of potential difficulties arising from it remains solely within the discretion and goodwill of the teacher. Therefore, it is crucial for educators to be aware of the existing research findings on factors influencing test and exam situations, which hold significant implications for all students, including the ones characterized by high levels of SPS.

In order to cater for the needs of all language exam/test takers, regardless of their SPS levels, individuals responsible for designing and conducting language evaluation procedures should, as far as possible, provide favorable conditions for students, thinking both about their emotional and physical comfort. Examiners should be also aware of the fact that their behavior and ability to control the testing situation may directly influence students' scores. Still, it is important to remember that some factors are out of human control, or their negative impact may be only marginally mitigated, for example, students' stress management may be linked to their genetic predispositions, which may not be subject to external influences (cf. Wu et al., 2015).

What seems to distinguish HSP test takers from low SPS ones is their greater susceptibility to external disruptors, especially different noises. The issue should be addressed by (a) HSP students themselves, who need to acknowledge their own sensitivity and learn how to cope with it, (b) teachers/examiners, who should recognize the problem and ensure appropriate exam/testing conditions, and (c) institutions and/or individuals responsible for organization of national exams. The existence of HSP students ought to be acknowledged and some adjustments currently available exclusively to students with special educational needs (e.g., possibility of wearing earplugs to reduce incoming noises, the option to forego formal clothes to alleviate tactile discomfort) should be allowed during examinations for all individuals willing to use them.

In the Polish educational context, students officially classified with special educational needs are entitled to numerous adaptations in their exam environment, provided the need arises from their specific dysfunction. These adaptations may include extensions of time, additional assistance (e.g., provided by a support teacher), specific adjustments to computer equipment, the option to write a test in a separate classroom, and different modifications to the examination paper (cf. Centralna Komisja Egzaminacyjna [Central Examination Commission], 2023). Similarly, at the tertiary level, lecturers are also obliged to adhere to recommendations from various intrauniversity bodies regarding the processes of teaching and examining students with special educational needs (cf., e.g., Uniwersytet Warszawski, Biuro ds. osób z niepełnosprawnościami [University of Warsaw. Office for persons with disabilities], 2024). Given that these adaptations are already developed and operational, extending some of them to the entire student community would entail moderate additional effort and financial investment. This expansion would consequently enable addressing the needs of HPS students, as well as those experiencing, but not diagnosed with various learning difficulties.

Finally, it is important to note that the current study is preliminary in nature and, consequently, has numerous limitations that should be considered when interpreting its findings. First, due to the use of convenience sampling, the participants exclusively represented experienced and advanced foreign language learners. Therefore, as this group of learners usually have rich testing experience, the results may not be generalizable to other individuals. Second, the participants

were only asked about their self-declared stress level and their assessments were not related to a specific situation, but to their general test-related experiences. As the study relied on such imprecise self-report measures for assessing stress perceptions, response bias might have occurred. Third, various potentially significant variables, including prior testing experience, were not controlled, which could have impacted the results. Finally, the retrospective responses given to the prompts in the final part of the study were mostly short and general in nature, providing rather limited data for the analysis.

Consequently, further studies that consider a larger number of variables in diverse educational settings and cultural contexts are needed. Additionally, more reliable methods of testing stress levels (e.g., measuring one's heartbeat or observations of physical stress symptoms during specific testing situations) should be implemented to verify the findings of this research project. It would be also worth to inquire with students about their experiences immediately after a specific test or an exam. In this way, a more immediate and detailed insight into their thoughts and feelings could be gained, potentially yielding richer and more nuanced data. Moreover, to better address HSPs' needs, research could focus on identifying and understanding the coping mechanisms employed by such individuals before, during, and after language testing situations.

Conflict of Interest Disclosure

The Author reports there are no competing interests to declare.

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Research Ethics Statement

Institutional ethical approval was not sought because of the research setting and low risk to participants. informed consent was obtained, participation was voluntary and allowed for anonymity, participants could withdraw from the study at each stage in a discrete fashion (not noticeable for the author)

Data Availability Statement

The datasets analyzed during the current study are available from the author on reasonable request.

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Appendix

Questionnaire 2 (translated from Polish)

1. Please, write down the nickname which you used in the previous questionnaire.

.....

2. Specify your gender:

- Female
- Male
- Non-binary
- Other
- I prefer not to say

3. How old are you?

.....

4. On the scale from 1 to 5 (where 1 equals no stress and 5 equals very high level of stress), specify how written language exams/tests are stressful for you:

	1	2	3	4	5	
Not stressful at all	☐	☐	☐	☐	☐	Very stressful

5. On the scale from 1 to 5 (where 1 equals no stress and 5 equals very high level of stress), specify how oral language exams/tests are stressful for you:

	1	2	3	4	5	
Not stressful at all	☐	☐	☐	☐	☐	Very stressful

6. I prefer:

- Oral language tests/exams
- Written language tests/exams
- I don't have a preference
- It depends on the language test/exam

7. I prefer:

- Onsite language tests/exams
- Online language tests/exams
- I don't have a preference
- It depends on the language test/exam