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High Sensitivity in Developmental Contexts: Longitudinal Studies of Early School-Age Children

Abstract
Manifestations of high sensitivity can be recognized even in the youngest children. Therefore, it is not possible to test it through activities that may disrupt its proper functioning. The research presented aims to investigate the development of this trait. There have been no longitudinal studies focusing on this trait in children, as they have not been widely researched or passed between devices that connect children with their parents. The study analyzed data from 131 children aged 8–11, including 84 tested twice, and 33 pairs of parents. The *Highly Sensitive Child Scale* in the Polish adaptation by Baryła-Matejczuk and Poleszak, and the *Highly Sensitive Person Scale* translated by Golonka and Gulla were used for measurement.

The collected data confirm the validity of distinguishing three significantly different groups among children that are under control. It was noticed that girls have a higher sensitivity level than boys, and high sensitivity characterizes them more often than boys at a statistically significant level. The similarity in sensitivity levels between children and their parents has also been confirmed, along with the statistical significance in both parents. The percentage of highly sensitive children in the study group does not align with Elaine Aron's theory assumptions and previous research findings. Additional predictions have been partially supported by the data.

While the obtained validation results have been expanded upon, it is important to note the absence of this type of testing, and these initial findings can serve as preliminary values for further in-depth analyses in the future.

Keywords: sensitivity, high sensitivity, highly sensitive child, parents

Słowa kluczowe: wrażliwość, wysoka wrażliwość, wysoko wrażliwe dziecko, rodzice

INTRODUCTION TO HIGH SENSITIVITY: A CONCEPTUAL OVERVIEW

High sensitivity is a term that refers to sensory processing sensitivity, a genetically determined disposition that involves deeper cognitive processing of stimuli and higher emotional reactivity (Aron et al., 2012). This trait affects approximately 15–20% of the population across approximately 100 different species (Aron et al., 2012; Aron, 2017a).

The construct in question may be described by the acronym **DOES**, which stands for **D** for depth of processing, i.e., analysing information extremely accurately and relating current events to analogous past experiences and stored data; **O** for overstimulation, which results from perceiving and deeply processing a wide variety of stimuli; **E** for emotional reactivity and empathy, manifested by intense responses to both positive and negative experiences and increased brain activity in areas associated with empathy, such as mirror neurons and the insula (Acevedo et al., 2010, after Aron, 2017a). **S**, on the other hand, expresses sensing the subtle, defined as noticing many fine details, nuances, and hard-to-grasp differences that result from particularly precise processing of sensory stimuli.

There is no consensus among researchers as to whether high sensitivity is a dichotomous variable or whether we should treat it more as a continuum. Aron and Aron (1997), at the outset of their concept, treat it rather dichotomously, indicating that an individual may or may not be characterised by it. Lionetti et al. (2018), based on a study conducted with a group of adults, suggest that there are three groups consisting of people with high, moderate, and low sensitivity. About 30% are highly sensitive individuals whom the authors, like Boyce and Ellis (2005), call 'orchids' due to the specific environmental conditions they require to develop their potential. A further 30% are undemanding 'dandelions' – the least sensitive, while the remaining 40% are 'tulips,' with average levels of sensitivity. Similar conclusions were drawn by Pluess et al. (2017) in their study, which focused on the sensitivities of a group of children and adolescents aged 8–19. The researchers also distinguished three groups based on the level of sensitivity. 20–35% for the highly sensitive, 41–47% for the moderately sensitive and 25–35% for the low sensitive.

Sensory processing sensitivity itself is not a disorder, but under adverse conditions, it may be associated with numerous difficulties and increase the risk of abnormal development (Baryła-Matejczuk et al., 2020; Greven et al., 2019). Research indicates associations of high sensitivity with, among others: anxiety (Bakker & Moulding, 2012; Jonsson et al., 2014), higher stress levels (Bakker & Moulding, 2012; Benham, 2006), depression (Bakker & Moulding, 2012; Serafini et al., 2017), internalisation problems (Boterberg & Warreyn, 2016), lower life satisfaction (Booth et al., 2015), insecure attachment styles, and suboptimal parenting styles (Branjerdporn et al., 2019). However, research also points to numerous associations between high sensitivity and positive dimensions of functioning. This disposition has been found to be associated with, among others, increased creativity (Bridges & Schendan, 2019 a, b), talent (Mullet & Rinn, 2017), increased social competence when interacting with positive parenting styles (Slagt et al., 2018), reduced depression, violence, and victimisation as a result of positive interventions (Pluess & Boniwell, 2015; Nocentini et al., 2018), and the ability to induce positive moods (Lionetti et al., 2018).

Although research suggests that high sensitivity has an innate basis, genotype-environment correlations should not be overlooked. Pluess (2019) notes that highly sensitive children may be more susceptible to the effects of negative stimuli but may also benefit significantly from supportive experiences. Sadowski et al. (2018) point out that guiding the development of such children in the right way may lead to the full realisation of their potential, resulting in a successful life and no difficulties in maintaining mental health. Greven et al. (2019) highlight that attempts to explore the construct of high sensitivity have largely relied on cross-sectional studies. Longitudinal models could help elucidate causality and analyse the issue of long- and

short-term dynamic changes in response to environmental stimuli. Such longitudinal research projects have not yet been undertaken.

HIGH SENSITIVITY IN THE DEVELOPMENTAL ASPECT

According to Aron (2010), all four aspects of this construct must be present for a child to be considered as having high sensitivity (as cited in Aron, 2017b). In contrast, an international team led by Baryła-Matejczuk (2021) suggests that sensory processing sensitivity in children may be analysed by examining their physical, emotional, interpersonal, and cognitive functioning.

High sensitivity in infants may be evidenced by high emotional reactivity, manifested in a tendency to cry easily, 'contagion' of parents' emotions and moods, and sleep problems that may be caused by excessive stimulus load. For sensitive preschoolers, it is characteristic to ask questions about more complex and serious issues than those asked by their peers, such as existential, moral, or ethical issues. Children in this group also experience pain and discomfort with greater intensity due to their unusual sensory sensitivity, which may lead to outbursts of anger and aggression. Highly sensitive school-aged children are often gifted in music, art, mathematics, and natural sciences, and their interests often involve 'adult' matters such as running a business or playing chess. However, they fear the judgment of others, seek teacher approval, and are easily embarrassed. Highly vulnerable students are more likely to be victims of violence. Still, at the same time, they respond more positively to ongoing interventions aimed at reducing violent behaviour at school (Nocentini et al., 2018). Adolescence is the moment in life when highly sensitive teenagers take up new activities without problems in terms of overstimulation, thanks to the lowest intensity of high sensitivity at that time (Aron, 2017b). However, they may find it difficult to adapt to subsequent educational institutions, develop romantic relationships, or form their own identity. The resulting engagement in risky behaviours such as drug use may be a manifestation of a struggle with anxiety or depression, risky sex – a way of coping with the high stress of decision-making, and other forms of self-harm – a cry for help. However, research by Pluess and Boniwell (2015) found that after a 12-month cognitive-behavioural, positive psychology-based prevention program, a group of highly sensitive girls had significantly lower depression scores than peers with lower levels of this trait. While sensitive schoolgirls may be more likely to experience depression than their peers, they may also be more receptive to and benefit more from psychological interventions.

It is important to remember, however, that although high sensitivity influences the child's behaviour and daily functioning, it is one of their many characteristics and, therefore, does not determine their behaviour in its entirety. Thus, it is difficult to describe a highly sensitive child unambiguously because of the differences resulting from biological and temperamental endowments, as well as the significance of the environment.

CHILD SENSITIVITY IN THE CONTEXT OF THE SENSITIVITY AND EDUCATIONAL BEHAVIOUR OF PARENTS AND CARERS

Baryła-Matejczuk (2021) emphasises the crucial importance of the attitudes of those in the immediate environment, both family and school, for the development process of the highly sensitive child. The researcher proposes a model of support that includes three components: identifying the potential of the highly sensitive child, the psychoeducation of parents and caregivers and the provision of support to them, and the exchange of experiences between all those involved in parenting. Russel (2021), on the other hand, notes that clinicians may support parents in the difficult process of parenting by correctly identifying the areas in which the child has difficulties. It is essential to use the *Highly Sensitive Child Scale* (Pluess et al., 2017), but also other tools for the assessment

of the child's functioning, which will allow the professional to identify the cause of the child's difficulties and point the parents in the right direction of intervention.

Appropriate support helps highly sensitive children to recognise their own sensitivity as a resource rather than a deficit or a burden. Sadowski et al. (2018) point out that highly sensitive children themselves sometimes find it difficult to accept their traits, so they try to hide them. A child's achievement of a state of well-being that allows for normal psychological and social development is only possible if they feel accepted by their parents, regardless of whether they meet their expectations (Stachyra, 2000). The consequences of inappropriate parental attitudes, on the other hand, may be maladaptive child behaviour, such as anxiety reactions, depression, mood swings, disobedience, or hyperactivity (Baryła-Matejczuk & Domańska, 2018).

Meanwhile, according to Aron (2017b), a child is more likely to be characterised by high sensitivity if this tendency also characterises one or both parents. Taking into account the functioning of highly sensitive parents seems to be a particularly relevant issue, as research suggests that this tendency, along with other variables, directly influences their behaviour towards their children. Research by Turner et al. (2012) found that when the sensory preferences of mothers and their children are at odds, caregivers most often have difficulty controlling their emotions, resulting in turbulent reactions. This incompatibility of modalities with one's parenting ideals leads to the reinforcement of uncertainty concerning the ideal performance of parental roles. In contrast, in light of the study by Branjerdporn et al. (2019), higher levels of anxious and avoidant attachment patterns in adulthood, distinguished on the basis of Bowlby's (1973) theory, are associated with greater sensory sensitivity. Parents characterised by higher levels of non-secure attachment (Ainsworth et al., 1978) are also characterised by higher levels of authoritarian and permissive parenting styles. Adults with higher levels of sensory sensitivity also reported more authoritarian or permissive parenting styles. High sensitivity thus acts as a mediator in the relationship between anxious attachment and both authoritarian and permissive parenting styles and between avoidant attachment and permissive parenting styles. The researchers suggest that the use of an assessment of sensitivity levels may be helpful in identifying parents at risk of adopting an authoritarian or permissive parenting style. Aron and Aron (1997) note that the relationship between growing up in a favourable family environment and the absence of an unhappy childhood appears to be particularly strong for sensitive males. The relationship is mediated mainly by the involvement of the father, which may be due to the traditional role of the father towards his son in Western culture. The often negative societal perceptions of sensitivity in men may also be relevant to the association, which would confirm, in particular, the protective role of the family environment.

However, highly sensitive parents are often able to communicate with their highly sensitive children in a way that is similar to their thinking; they know the answers to their dilemmas, understand how to provide the appropriate level of stimulation, and have experience in dealing with the challenges that arise from this trait. Similarly, when dealing with less sensitive offspring, a highly sensitive parent is better able to tune into their child and demonstrate creativity in parenting (Aron et al., 2019). However, more sensitive parents need to be careful to give their non-highly sensitive children the right amount of opportunities for new experiences. In contrast, in the case of children with high sensory processing sensitivity, they need to create a boundary between themselves and their child and avoid over-identifying with them (Aron, 2017b).

Although the primary responsibility for the care and upbringing of children into adulthood rests with parents (Brezinka, 2007), teachers also have an important role to play. A positive school climate, which largely depends on school staff, may become a protective factor in terms of less frequent, less severe, or later onset of risky behaviours among young people, such as substance use, violence, systematic bully-

ing, misdemeanours and delinquency, conduct disorders, truancy, and risky sexual behaviour (Ostaszewski, 2012). Teachers' actions have didactic as well as educational and social effects, shaping the values, beliefs, and behaviours of other members of the school and local community (Brzezińska, 2008). Teachers must also remember that they are potential role models for their pupils (Brezinka, 2007), so their deliberate but also unplanned actions have an impact on their pupils.

RESEARCH METHOD

Research problem and hypotheses

The study aimed to explore the relationship between levels of sensitivity in children and their parents in the context of parental acceptance. Cognitive objectives included determining what proportion of the study group were highly sensitive children and analysing the dynamics of sensitivity in children. The study also investigated the relationship between children's and parents' levels of sensitivity. The practical aim, on the other hand, was to formulate recommendations for optimal developmental conditions for children with different levels of sensitivity in family and school contexts. Three hypotheses were formulated.

Hypothesis 1. In the study group, it is possible to distinguish between children with high, average, and low levels of sensitivity, with the largest proportion being moderately sensitive.

Research by Pluess et al. (2017) demonstrated that the group of children and adolescents aged 8–19 years may be divided into three subgroups based on their level of sensitivity. Analyses showed that highly sensitive ('orchids') accounted for 20–35%, while the low sensitive ('dandelions') accounted for 25–35% of respondents. The moderately sensitive ('tulips') were the most represented, with 41–47%. Similarly, scientific work focusing on the sensitivity of sensory processing in adults considers it reasonable to distinguish three clusters (Lionetti et al., 2018), with the largest proportion consisting of moderately sensitive individuals.

Hypothesis 2. Within the span of 12 months, children's sensitivity should change little.

According to Aron and colleagues (2012), high sensitivity is a trait that is significantly related to a person's genetic endowment. Under this assumption, this trait should not change significantly over time. There may be some small dynamics in the level of sensitivity under the influence of environmental and educational influences.

Hypothesis 3. There is a similarity in the level of sensitivity between children and their parents.

In addition to environmental influences, sensitivity is also influenced by biological and genetic factors. A child is born with sensory organs built in a specific way and is characterised by its inherent excitability. Consequently, a similar sensitivity of sensory analysers in the child and at least one of the parents may be expected due to the partially shared genetic

Table 1. Distribution of children tested with the *Highly Sensitive Child* scale in the first and second phases of the study

	I phase		II phase	
Gender	**N**	**%**	**N**	**%**
Girls	69	53	48	57
Boys	62	47	36	43

Source: own study.

material. Stimulation, upbringing, and socialisation also significantly impact sensitivity levels. Parents also consider their own needs when caring for their children, thus transmitting their own attitudes and values. This makes it highly likely that the child will be sensitised to the same stimuli as their parents. Aron (2017b) also observes that a child is more likely to be highly sensitive if one or both of their parents exhibit this characteristic.

Characteristics of the Participants

Initially, parents and their children attending three schools were invited to participate in the study. Subsequently, additional participants were recruited through random snowball sampling by disseminating information in parent groups, online forums, blogs, and at schools.

The criterion for inclusion in the study group was the age of the child, which ranged from 8 to 11 years. The lower age limit was based on the requirement to demonstrate reading skills. In contrast, the upper age limit was determined by the desire to study students in the early years of school, when they are faced with and adapt to the demands of educational institutions. This period is also characterised by multifaceted development and the acquisition of a range of new knowledge, skills, attitudes, and behaviours. Consequently, 131 children participated in the first phase of the study using the Highly Sensitive Child Scale, and 84 children participated in the second phase. The loss of participants was due to organisational factors, such as a high number of school absences due to illness during the second measurement. The distribution of the children in the study is presented in Table 1.

Of the group of children surveyed twice, 33 participated in the study with both parents. The sample for this part of the study consisted of 33 mothers aged 29.3–48.2 (M = 39.01; SD = 4.67) and 33 fathers aged 35.1–53.11 (M = 41.38; SD = 4.66). The children in the study were 15 girls aged 8.0–11.0 (M = 9.91; SD = .76) and 18 boys aged 8.0–10.8 (M = 9.59; SD = .80).

Study Procedure and Research Instruments

The student survey was conducted in face-to-face contact, while the research materials for parents were delivered to them through their children. The procedure involved a double measurement of sensitivity in children (retesting after approximately one year) and a single measurement of sensitivity in parents. The development of the research procedure was based on information contained in the *Code of Good Practice in Research with Children* conducted from a social science perspective.

Elaine Aron's Highly Sensitive Person Scale (1996) was translated by Krystyna Golonka and Bożena Gulla based on a self-report questionnaire available at https://hsperson.com/test/highly-sensitive-test/. Using a Likert scale ranging from 1 (*not at all*) to 4 (*moderately*) to 7 (*extremely*), respondents assess the extent to which they are affected by the 27 statements comprising the scale. The resulting score, which is the average of responses across all items on the scale, allows for categorisation into groups of 'orchids,' 'tulips,' or 'dandelions' (Lionetti et al., 2018). The tool demonstrates psychometric properties suitable for research applications (e.g., Lionetti et al., 2018; Pluess et al., 2017), as evidenced by high reliability (alpha .85–.87) in studies conducted by the authors (Aron and Aron, 1997).

The *Highly Sensitive Child Scale* was developed by a team led by Michael Pluess (2017) and translated by Monika Baryła-Matejczuk and Wiesław Poleszak using the back-translation method, following the official procedure and in accordance with the authors' recommendations (based on Pluess et al., 2017; Baryła-Matejczuk, personal communication and consent to use: 17 October 2021). The questionnaire consists of 12 items, to which children respond on a seven-point Likert scale ranging from 1 (*definitely no*) to 4 (*moderately*) to 7 (*definitely yes*). The score, which is the average of the scores from all the questions, indicates that respondents belong to one of three groups: those with high, moderate, or low sensitivity. The tool may be used for research purposes due to its sufficient internal consistency and adequate psychometric

Table 2. Level of sensitivity in the study group of children

		I measurement			II measurement		
		N	**%**	***Me***	***N***	**%**	***Me***
		131	100	-	84	100	-
Level of sensitivity	High	70	53.4	5.25	33	39.3	5.33
	Moderate	48	36.7	4.42	42	50.0	4.38
	Low	13	9.9	3.25	9	10.7	3.42

Source: own study.

Table 3. Distribution of children tested with the Highly Sensitive Child scale in Measurement I and Measurement II

		I measurement		II measurement	
		N	**%**	***N***	**%**
		84	100	84	100
Level of sensitivity	High	46	54.8	33	39.3
	Moderate	29	34.5	42	50.0
	Low	9	10.7	9	10.7

Source: own study.

properties, but it cannot be used for individual diagnosis (Pluess et al., 2017). Research has shown sufficient reliability of the original version of the scale, with a Cronbach's alpha of .71–.82, while the Polish version was .63–.72.

RESULTS

Distribution of subgroups of children differing in level of sensitivity

The distribution of the overall Highly Sensitive Child scale score, analysed using the Shapiro–Wilk test in both the first group of 131 children (p <.01) and the 84 children (p <.05), differed from the normal distribution. Therefore, non-parametric tests were used to determine the child's variable level of sensitivity.

To distinguish among children in three subgroups differing in terms of sensitivity level, cut-off points of 3.7 and 4.8, as defined by Pluess et al. (2017), were utilised. The outcome of applying these values in the analysis of the results of the examined children is presented in Table 2.

Due to the non-fulfilment of parametric test assumptions, the validity of distinguishing three subgroups in the group of 131 children studied was verified using the Kruskal–Wallis test. The three groups differed significantly in

terms of sensitivity level ($H2 = 103.84$; $p < .001$). *Post hoc* comparisons between the two groups using Dunn's test also suggest statistically significant differences. Similarly, the results of the Kruskal–Wallis test for the group of 84 children also indicate statistically significant differences between the three distinguished groups ($H2 = 67.64$; $p < .001$). *Post hoc* comparisons further confirm statistically significant differences. The median values for the individual groups distinguished based on sensitivity level in the first and second measurements are provided in Table 2.

The conducted analysis allows for the conclusion that hypothesis 1 is partially supported. In the studied group, children with high, moderate, and low sensitivity levels may be identified, although moderately sensitive children do not constitute the largest proportion in the group of 131 children.

Inspired by the above results, the researchers decided to extend the analysis to other aspects. In the group of 131 children, the Mann–Whitney *U* test was employed to examine differences in sensitivity levels by gender. The analysis revealed that the group of girls ($Mrank = 75.28$, $Me = 5.00$) achieved significantly higher sensitivity levels compared to the group of boys ($Mrank = 55.68$, $Me = 4.59$), $U = 1499.0$, $z = -2.95$, $p < .005$. The strength of this effect is moderate ($rg = .30$).

A chi-squared test for independence was also calculated to compare the frequency of high sensitivity occurrence in girls and boys. A significant interaction was observed: $\chi 2(2) = 8.14$, $p < .05$. In the study group of 131 children, high sensitivity is more prevalent in girls (65.2%) than in boys (40.3%).

Dynamics of sensitivity among surveyed children

The distribution of the child's sensitivity level variable, measured by *The Highly Sensitive Child Scale* and analysed using the Shapiro–Wilk test, differs from the normal distribution ($p < .05$). Therefore, the non-parametric Wilcoxon test was used to assess differences in the group of children examined twice ($N = 84$).

Three subgroups with different levels of sensitivity were distinguished based on the scores obtained in the first measurement. The distribution of children belonging to the three groups, distinguished by their level of sensitivity, is presented in Table 3.

The significance of the differences in overall sensitivity scores between the first and second measurements in the identified groups was tested using the Wilcoxon test. Analysis of the test results indicates that moderately sensitive 'tulips' had a statistically significantly higher sensitivity score on the second measurement ($Me = 4.66$) than on the first ($Me = 4.50$, $Z = -2.17$, $p < .05$, $rc = .45$). Similarly, a statistically significant lower score on the second measurement ($Me = 4.83$) compared to the first ($Me = 5.33$) was observed in the highly sensitive 'orchids' group ($Z = -3.39$, $p < .001$, $rc = .58$). In contrast, the 'dandelions' showed no statistically significant change in sensitivity between the first ($Me = 3.27$) and second measurement ($Me = 4.08$, $Z = -1.60$, $p = .11$).

The dynamics of the children's sensitivity levels were then analysed (see Table 4).

A change in sensitivity level was observed at the second measurement in 38 children, representing 45.2% of the study group. When there was a dynamic, it was usually towards a lower level of sensitivity (28.6%). For the majority of the children, this was a difference of one degree, while for 3.6%, there was a change from a high to a low level of sensitivity. The hypothesis tested was only partially supported.

Similarity in sensitivity levels between children and parents

The cut-off values identified by Lionetti et al. (2018) were used to distinguish parents with low, moderate, and high levels of sensitivity: of 3.71 and 4.66, while the previously cited cut-offs of 3.7 and 4.8 (Pluess et al., 2017) were used to distinguish the three groups of children with different levels of sensitivity. Table 5 shows the distribution of sensitivity in the study group of parents and children.

A concordance between the sensitivity level of the child and both parents was observed in

Table 4. Dynamics of sensitivity levels among children ($N = 84$)

	I measurement	**II measurement**	***N***	**%**
No change in sensitivity level	low	low	4	4.8
	moderate	moderate	24	28.6
	high	high	18	21.4
	TOTAL		46	54.8
Change in the level of sensitivity	low	moderate	5	5.9
	moderate	low	2	2.4
	moderate	high	9	10.7
	high	moderate	19	22.6
	high	low	3	3.6
	TOTAL		**38**	**45.2**

Source: own study.

Table 5. Breakdown of respondents by level of sensitivity using cut-off points

	Mother ($N = 33$)				**Father ($N = 33$)**				**Child ($N = 33$)**			
Level of sensitivity	***N***	**%**	***M***	***SD***	***N***	**%**	***M***	***SD***	***N***	**%**	***M***	***SD***
high	4	12.1	3.25	.19	13	39.4	3.13	.47	5	15.2	3.33	.36
moderate	11	33.3	4.43	.27	13	39.4	4.17	.32	11	33.3	4.33	.34
low	18	54.6	5.16	.44	7	21.2	5.03	.41	17	51.5	5.53	.51

Source: own study.

four families, three of them with a high sensitivity level and one with an moderate sensitivity level. In addition, the same level of sensitivity between mother and child occurred in 11 situations, of which nine involved high sensitivity and two involved moderate sensitivity. Conversely, the same level of sensitivity was found in six pairs of fathers and children – two at each level of sensitivity. It allows for a conclusion that in 21 observations, representing 63.6% of the families studied, there is equal sensitivity between the child and at least one of the parents, which may be assumed as supporting hypothesis 3.

Additional tests were also carried out on the group of parents. The Spearman correlation analysis carried out indicates that there is a statistically significant strong relationship between the mother's level of sensitivity and the father's level of sensitivity: $rho(31) = .57$, $p < .001$.

DISCUSSION

The study aimed to explore the construct of high sensitivity in children, its prevalence, dynamics and relationship with parental sensitivity. In relation to hypothesis 1, contrary to what was

postulated, it was found that in a sample of 131 children, high sensitivity accounted for the largest proportion (53.4%), which is significantly higher than the result obtained in the study by Pluess et al. (2017), where 'orchids' accounted for 20–35% of the subjects. The result also differs from that obtained by Baryła-Matejczuk et al. (2022) on a sample of Polish children, where highly sensitive included 37.7%, 'tulips' comprised 20.5% of the respondents, and children with the lowest level of sensitivity made up the largest group (41.8%). The results are also inconsistent with the study by Tilmann et al. (2021), where the highly sensitive accounted for 32.44% of the children surveyed, the least sensitive for 14.29%, and the moderately sensitive for the main part of the group (53.27%). The lack of convergence in the size of groups with different levels of sensitivity in different studies may be related to cultural differences, changes related to the developmental stage, as well as the characteristics of the tool itself, as pointed out by Baryła-Matejczuk et al. (2022). However, the analyses performed confirmed the validity of distinguishing the three groups of children with significantly different sensitivity, which is in line with the results of previous studies (Baryła-Matejczyk et al., 2022; Pluess et al., 2017; Tillmann et al., 2021).

According to hypothesis 2, the dynamics of sensitivity in children should be small during the study period. About 12 months after the first measurement, the level of sensitivity was significantly lower in the 'orchid' group and significantly higher in the 'tulip' group. No statistically significant change was observed in the 'dandelion' group. It may be assumed that the reason for the decrease in sensitivity in the 'orchid' group is a kind of 'immunisation' by habituation, whereby the perceived sensory stimuli become less taxing. The role of peers and their socialising influences is also not insignificant. The change in highly sensitive children is adaptive and allows them to better integrate into a society that often has an unaccepting attitude towards them. The behaviours and characteristics that are a direct result of being highly sensitive are very often unwanted and unappreciated. This may lead the most sensitive to hide their true nature and even change their perception of the world. It is, therefore, likely that environmental influences play a greater role in shaping high sensitivity than the authors of the concept initially believed. In the case of the 'tulips,' the change towards a higher level of sensitivity may be expected to occur under the influence of interactions from the family and school environment aimed at awakening empathy and sensitivity to emotional stimuli. On the other hand, concerning the 'dandelions,' the results obtained indicate that the variable is relatively stable, even during the developmental period, since it is directly linked to the specificity of the nervous system. It may also be assumed that it is necessary to be characterised by a certain degree of sensitivity to be able to shape this degree in further development. This is because this trait is determined not only by constitutional characteristics but is also subject to environmental influences. It may not be ruled out that this relationship does not occur in the least sensitive individuals precisely because of an insufficient primary basis. However, the observed changes need to be interpreted with caution, as the study was based on the children's self-assessment of their level of sensitivity. It is uncertain whether they had sufficient insight to make inferences about themselves and whether they understood the questionnaire items correctly. Further research is therefore needed.

According to hypothesis 3, there is a similarity in the level of sensitivity of children and their parents. Convergence in belonging to different subgroups of sensitivity was observed in a larger proportion of families (63.6%). The lack of such congruence for the other triads studied may indicate the important role of stimulation, socialisation, and upbringing, as opposed to the importance of genetic background.

The current research also suggests that the level of sensitivity may, to some extent, be related to gender. The results seem to confirm a previous suggestion by Baryła-Matejczuk et al. (2021), where the authors found significantly higher levels of sensitivity in the girls studied, with an effect size of $d = .21$, and Pluess et

al. (2017), where the effect size was $d = .34$. In the present sample, statistically significant differences were demonstrated, with an effect size equal to $rg = .30$. If this trend were to be confirmed in subsequent observations, it would be important to examine whether the trait in question manifests itself differently in girls and whether they face different difficulties than sensitive boys. The plausibility of these predictions should lead to the consideration of methods for early identification of highly sensitive children and a plan for supporting their development according to their individual needs and abilities.

An interesting observation derived from the results of the present study is also the existence of a statistically significant strong association in the sensitivity of both parents. If this co-occurrence were to be confirmed in other, larger samples, one might wonder whether the individuals studied are more likely to seek partners with similar levels of sensitivity. However, according to Aron (2017a), highly sensitive people tend to form relationships with less sensitive people. Another hypothesis might be that sensitivity levels homogenise throughout a relationship, so it would be worth asking respondents about the duration of the relationship. One might also wonder whether similar levels of sensitivity among parents translate into a consistent approach to parenting. These conjectures would require further research.

CONCLUSIONS

The analysis shows that children have different levels of sensitivity and, therefore, different needs and capacities. Thus, it is necessary to adapt approaches to each subgroup. In this respect, it is essential to provide parents and caregivers with sound knowledge, the application of which will allow the actions taken to be properly planned and targeted. In the family context, it is important to respect the aspirations of all members, even when they are difficult to reconcile. Particular attention should be paid to the intensity of stimulation, the regulation of emotions, and the management of overstimulation. It is also extremely important to avoid over-identification when the sensitivity levels of parent and child are compatible.

The awareness that highly sensitive children may make up at least one-third of the population should lead to special attention being paid to their needs and difficulties. Baryła-Matejczuk et al. (2022) note that this knowledge may, to some extent, lead to a questioning of mainstream educational practices. Given that this is such a large proportion of the population, perhaps interactions tailored to this subgroup should be applied to the entire class team. Many of the measures taken, such as adjusting the intensity of stimulation, learning to cope with overload, introducing relaxation exercises, using materials with different sensory modalities, or using educational methods in the spirit of a humanistic approach, may be functional when working with all children, not just highly sensitive ones. In the school context, an individual approach to each child is of paramount importance, including, in particular, the teacher's thorough knowledge of each pupil, the adaptation of working methods to the abilities of all pupils, and continuous cooperation with parents to exchange important information. Last but not least, it is important to use assessment to review pupils' abilities comprehensively and to support them in their pursuit of success.

The current research suggests that factors beyond genetic predisposition may also play a role in shaping sensitivity, including what Elaine Aron refers to as high sensitivity. This observation underscores the need for even greater attention to creating appropriate conditions in the child's environment. It is particularly important to pay attention to the functioning of the family system, including the deliberate actions of family members as well as socialisation processes. Last but not least, a positive atmosphere at school is important to ensure the safety of pupils and to enable their all-round development.

The present analysis also shows that there is a similarity in the level of sensitivity between children and their parents. This may be beneficial in terms of a better understanding of the child's needs or the ease of providing the appropriate level of stimulation. However, the need to pro-

vide the child with new experiences, including those outside the parents' preferred repertoire of activities, should not be overlooked. In cases of families with more children, care should be taken to identify and agree on each child's individual wishes.

Given the conclusion of the current study that girls are more often characterised by high sensitivity and that the level of this characteristic is significantly higher in girls than in boys, it seems necessary to pay special attention to highly sensitive girls. Psycho-educational interventions, which may significantly reduce the level of depression and the occurrence of victimisation and internalising symptoms (Nocentini et al., 2018; Pluess & Boniwell, 2015), have a measurable effect on this group. Nevertheless, it is also important to pay attention to the ways in which boys display sensitivity, particularly emotional sensitivity. Stereotypes about male emotional expression, such as 'boys don't cry,' are still present in society and affect their emotional functioning and hinder open interpersonal communication (Mandal, 2004). Therefore, it is important to create conducive conditions for the development of highly sensitive boys, as they similarly benefit from psychological interventions (Nocentini et al., 2018).

The results of the conducted analyses also suggest that there is a concordance in the sensitivity levels of both parents. This observation highlights the need to pay particular attention to situations where the child's sensitivity levels differ from those of the parents. This is because the circumstances described may lead to an attempt to interfere excessively in the child's functioning in order to reconcile the child's aspirations with the needs of the caregivers. There is also the risk, previously mentioned, of restricting the child's activities to those chosen by the parents. Given the growing interest in the construct of high sensitivity, it is crucial to accurately identify this trait in children and differentiate it from autism spectrum disorder, sensory integration disorder, selective mutism, social phobia, or separation anxiety, among others. Any worrying observations should be discussed with specialists in order to avoid situations where specific disorders are not treated because all behaviours are considered to be the result of a high level of sensitivity. The characteristics discussed, although not constituting a disorder per se, very often co-occur with the difficulties mentioned, so a thorough differential diagnosis should be carried out.

The present study is the first of its kind known to the author. Longitudinal observations, especially involving children, have so far been limited to a small number of samples. Further research could be conducted to determine what proportion of the population, especially Polish students, are highly sensitive. Obtaining results consistent with the present study, indicating a significant percentage of 'orchids,' should lead to an analysis of the consequences of this observation and, in the long term, to the development of work and support methods targeted at this group. Further longitudinal studies should also analyse the dynamics of sensitivity in children. If the observations from these analyses are confirmed, it would be necessary to investigate the factors that may influence the changes in sensitivity that tend to occur.

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