



Making sense of it all: The impact of sensory processing sensitivity on daily functioning of children



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ABSTRACT

Previous research on sensory processing sensitivity and related concepts showed an association with internalizing problems. The current explorative study investigated the underlying factor structure of the parent-report Highly Sensitive Person Scale (HSPS) and its association with problems in daily functioning. Caregivers of 235 children (3–16 years) completed the HSPS as well as questions on daily functioning. First, the factor structure of the HSPS was explored and evaluated. Second, both differences in reported problems between a high SPS and a control group, and in SPS factors between children with few versus many problems, were examined. Results suggested that the scores of the HSPS have good internal consistency and supported a two-factor structure which distinguishes Overreaction to Stimuli (OS) and Depth of Processing (DP). Children with high SPS were reported to have more internalizing problems. High OS was more common in children who cried excessively as a baby, children with medically unexplained physical symptoms (MUPS), sleeping, eating and drinking problems while high DP was more common in children with MUPS and sleeping problems. This study provides the first empirical evidence that the parent-report HSPS may add valuable information to the assessment of children with problems in daily functioning.

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1. Introduction

Aron and Aron (1997) described Sensory Processing Sensitivity (SPS) as a genetically determined temperamental or personality trait which is present in some individuals and reflects an increased sensitivity of the central nervous system and a deeper cognitive processing of physical, social and emotional stimuli (Aron, Aron, & Jagiellowicz, 2012). The terms “hypersensitivity” or “highly sensitive”, which are popular synonyms for the scientific concept of SPS, are increasingly used in psychological practice both with adults and with children. However, despite the rising popularity of the concept in general society and previous research on different genes, patterns of brain activation, behaviors, and physiological reactions associated with high SPS (see Aron et al., 2012 for an overview), there is still a lack of fundamental, empirical and independent scientific evidence for the temperamental concept of SPS. The present study has to be considered as exploratory since it is, to our knowledge, the first which examines SPS in children.

Aron and Aron (1997) suggested that the trait would be present in 15 to 20% of the population. Individuals with high SPS are believed to be easily overstimulated by external stimuli because they have a lower perceptual threshold and process stimuli cognitively deeper

than most other people. In addition, they 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 (Aron et al., 2012). Further, research in evolutionary biology provides evidence that the trait of SPS can be observed in over 100 nonhuman species in the form of sensitivity, responsiveness, plasticity and flexibility (Wolf, van Doorn, & Weissing, 2008).

Aron et al. (2012) state that both introversion (the inhibition of social behaviors) and neuroticism (the reporting of intense negative emotion) could theoretically, in some cases, be aspects of a general sensitivity. Both Aron and Aron (1997) and Smolewska, McCabe, and Woody (2006) undertook systematic statistical comparisons of the sensitivity measure and several measures of traditional personality traits of introversion and neuroticism to examine similarities and differences between SPS, introversion and neuroticism. Their findings indicated that SPS is a unique personality trait which deserves to be examined separately. This is an important finding, since the trait of sensitivity has often been confused with introversion and neuroticism in previous research on personality (see also Aron et al., 2012).

A low sensory threshold, an important characteristic of high SPS, is also present in different sensory processing patterns and disorders, such as “Sensory Sensitivity” and “Sensory Avoiding” (Dunn, 2001), “Sensory Defensiveness” (Ayres, 1963) and “Sensory Over-Responsivity” (SOR; Miller, Anzalone, Lane, Cermak, & Osten, 2007). It

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is important to note that, although SPS seems to be associated with these sensory processing patterns and disorders, it concerns a temperamental trait and should therefore not be confused with these disorders. However, the conceptual overlap between these various constructs shows the extensive interdisciplinary interest in characteristics of hypersensitivity and emphasizes the theoretical and practical importance of the concept.

The processing of sensory events, as a part of everyday life, is suggested to have a significant impact on human experience and behavior. In adults, high SPS is associated with high levels of stress, symptoms of ill-health, alexithymia, anxiety and depression (Benham, 2006; Liss, Mailloux, & Erchull, 2008; Liss, Timmel, Baxley, & Killingsworth, 2005), and in combination with a negative childhood environment, also with negative affectivity and shyness (Aron, Aron, & Davies, 2005). Sensory processing may interfere with the participation in daily activities, and social, cognitive, and sensorimotor development in children as well (Dunn, 2001). Despite the fact that no research seems to directly examine the association between high SPS and problems in the daily functioning of children, a number of studies examined the relationship with different sensory processing patterns and disorders. Although temperamental SPS and the different sensory processing patterns and disorders are not the same, they do have a low sensory threshold in common and can thus provide preliminary insight into the association between high SPS and problems in daily functioning. Research showed that “Sensory Sensitivity” is associated with sleeping and behavioral problems (Reynolds, Lane, & Thacker, 2012; Shochat, Tzischinsky, & Engel-Yeger, 2009), and ritualism and obsessive compulsive disorder (OCD) symptoms (Dar, Kahn, & Carmeli, 2012). “Sensory Defensiveness” is related to eating, learning and other social, emotional and behavioral problems (Smith, Roux, Naidoo, & Venter, 2005; Stephens & Royeen, 1998). “Sensory Over-Responsivity” is related to internalizing and externalizing problems, impaired emotion regulation, and less adaptive social behavior, and seems to be more frequently present in children with clinically significant anxiety (Ben-Sasson, Carter, & Briggs-Gowan, 2009; Conelea, Carter, & Freeman, 2014). Further, research from Gourley, Wind, Henninger, and Chinitz (2013) found that in a sample of children with a wide range of developmental and behavioral diagnoses the presence of sensory processing difficulties was related with more internalizing and externalizing behavioral problems. Furthermore, in children with an autism spectrum disorder (ASD), ‘Sensory Sensitivity’, ‘Sensory Avoiding’, ‘Sensory Defensiveness’ and ‘Sensory Over-Responsivity’, are related with more negative emotional reactions and more fear (Baranek, David, Poe, Stone, & Watson, 2006; Ben-Sasson, Hen, et al., 2009; Green, Ben-Sasson, Soto, & Carter, 2012; Green & Ben-Sasson, 2010; Kientz & Dunn, 1997; Pfeiffer, Kinnealey, Reed, & Herzberg, 2005). Overall, it can be concluded that different aspects of increased SPS seem to be mainly associated with internalizing problems. This emphasizes the need for a fundamental scientific framework for understanding the temperamental trait of SPS in children.

To measure individual differences in SPS in adults, Aron and Aron (1997) developed the self-report 27-item Highly Sensitive Person Scale (HSPS), containing items that measure sensitivity to a large variety of stimuli, the extent to which an individual quickly feels overwhelmed by intense sensory input, and artistic and emotional sensitivity. For research purposes, the items of the HSPS are rated on a 5- or 7-point Likert scale. However, there is also a yes/no response format available in the popular books and on the website of Elaine N. Aron. Despite the variety of types of sensitivity in the items, the HSPS was initially reported to have a one-dimensional structure (Aron & Aron, 1997) and was shown to have adequate reliability, content-oriented validity, and validity regarding relationships with conceptually related constructs (American Educational Research Association, American Psychological Association, & National Council On Measurement In Education, 2014; Aron & Aron, 1997; Benham, 2006; Evans & Rothbart, 2008; Liss et al., 2008; Smolewska et al., 2006). To determine whether a person has high SPS or not on a group level, Aron and Aron (1997) propose to use a relative

cut-off score of the top 20%. This cut-off score is based on previous research which suggested that SPS in adults is best considered as a dichotomous category variable with a visible break point in the sample distribution around the 10 to 35% (for an overview of the studies on the sample distribution of SPS see Aron et al., 2012). The dimensionality of the HSPS in adults was examined by three independent studies. Liss et al. (2008) and Smolewska et al. (2006) revealed a post-hoc three-factor structure, with a strong intercorrelation between the factors suggesting a single higher order construct. Evans and Rothbart (2008) however, proposed a two-factor solution very similar to their model of adult temperament (Evans & Rothbart, 2007). More recently, Aron theoretically redefined the different facets of SPS using the acronym “DOES” (Aron et al., 2012; Aron, 2010, 2012). “Depth of Processing” includes features like empathy, conscientiousness, having intensive feelings for others, having living dreams and a rich imagination, and the presence of a general thoughtfulness or awareness of long term consequences (i.e. “pause-to-check approach”). “Overstimulation” refers to the presence of a more frequent and stronger autonomic arousal towards situations which are perceived as stressful. “Emotional Intensity” refers to the presence of both more intense negative and positive emotional responses. Finally, “Sensory Sensitivity” refers to the presence of a low pain threshold and a low tolerance of high levels of sensory input, and noticing subtle differences. It can be assumed that the presence of these four characteristics has a considerable influence on the daily functioning of children and is associated with different internalizing and externalizing behavioral problems. According to Aron and colleagues, these four factors would load together on the unidimensional construct of SPS. However, until now there has been a lack of empirical evidence to support this theoretical four-factor model. Moreover, there is no explicit model available of which items from the HSPS load on the different theoretical factors, and some items seem to have a conceptual overlap which makes it impossible to compose an a priori factor model.

In analogy with the adult questionnaire, a 23-item parent-report questionnaire for children was developed and published in Aron’s book “The Highly Sensitive Child (HSC)” (Aron, 2002). It is important to note that the items of the HSPS for children have a different content and number compared to the adult HSPS. Unlike its adult counterpart, the reliability, distribution, validity and dimensionality have not yet been investigated. Given the increasing use of the concept of “high sensitivity” in children, an instrument objectively measuring this trait is urgently needed.

The first goal of the present study was to explore the underlying factor structure of Aron’s 23-item parent-report HSPS for children. Until now, research only focused on the factor structure of the HSPS for adults, resulting in a three- or two-factor model. However, based on the fundamental differences between the HSPS for children and the HSPS for adults, and the lack of an explicit model for the DOES-theory in SPS, there was no a priori factor model for the HSPS in children available that could be tested, except for the one-factor structure as proposed by Aron and Aron (1997). The second goal was to investigate the association between high SPS and problems in daily functioning. First, differences in problems in daily functioning such as antisocial behavior, medically unexplained physical symptoms (MUPS) and, sleeping, eating and drinking problems between a group of children with high SPS and a group of children with average or low SPS were examined. Based on different studies including partial aspects of SPS such as “Sensory Sensitivity” (Dunn, 2001), we expected that children in the high SPS group would have more problems in their daily functioning, especially internalizing problems. Second, differences in the factors of the HSPS and the total 23-item HSPS, as used in clinical practice, were identified between children with few versus many problems in daily functioning. Again, children with especially more internalizing problems were expected to have higher SPS in general and more specifically, were also expected to have higher scores on the characteristic of SPS that is associated with sensory (hyper)sensitivity.

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