



Canva (2026)

SENSORY PROCESSING DIFFERENCES

Introduction

Sensory processing is how the brain takes in and makes sense of information from the environment, such as sound, touch, movement, and visual input. When this process works differently, it can lead to sensory processing differences (Dean *et al.*, 2022; Lane *et al.*, 2019). This might mean a child is over-responsive where they avoid sensory input or under-responsive where they need or seek sensory input (Ben-Sasson *et al.*, 2019). Sensory processing differences can be considered an additional learning need, when they impact a child's ability to access learning or engage in everyday activities, which may require additional learning provision (Additional Learning Needs and Education Tribunal (Wales) Act, 2018). These differences are neurological, not just behavioural (Lane *et al.*, 2019). However, how a child copes often depends on how their sensory needs fit the environment, so the same child may cope in one setting and struggle in another (Bailliard *et al.*, 2022). This suggests that the way a child responds to the environment is linked to how they process sensory information. This is considered important, because behaviours we see in practice are often a response to how the child is experiencing the environment, not a choice or "misbehaviour". Research shows that sensory differences are very common in neurodevelopmental conditions, especially autism (Ben-Sasson *et al.*, 2019). Approximately, 80% of children with autism experience sensory processing differences (Patil and Kaple, 2023).

Identifying and Diagnosis



Figure 3: Sensory profile 2
(Winnie Dunn, n.d.)

Sensory processing differences are usually identified through observations, discussions with parents and staff, and tools such as sensory profile checklists (Jorquera-Cabrera *et al.*, 2017). Sensory Profile developed by Winnie Dunn, often used and interpreted by occupational therapists is a tick list form completed by the child's carers and is part of a wider assessment alongside observations ((Dean *et al.*, 2022; Passarello *et al.*, 2022, Pearson, 2026). The sensory profile 2 helps identify a child's sensory processing patterns across multiple settings including school, home and community and how these may affect participation (Pearson, 2026). However, while these can be useful, they rely heavily on adult report and interpretation. A study by Gunderson *et al.* (2023) found that self- and caregiver-report tools vary a lot in what they measure and the strength of the evidence behind them, so results should be used cautiously (Gunderson *et al.*, 2023). Additionally, sensory processing differences are not recognised as a standalone diagnosis (van den Boogert *et al.*, 2022), meaning they are usually described as part of other conditions such as autism or ADHD rather than a standalone diagnosis (Passarello *et al.*, 2022). This suggests that on one hand, there is strong research showing that sensory differences are real and linked to brain functioning. However, on the other hand, without a clear diagnosis, children may struggle to access support.

Impact of Barriers

According to Persson -Waye *et al.* (2019) excessive noise in early environment can negatively impact children's behaviour and emotional wellbeing, with some children becoming overwhelmed or withdrawn. In such setting children with sensory processing differences may struggle to filter out irrelevant sensory information (Patil and Kaple, 2023). However, the impact of noise may vary depending on a child's sensory profile, such as whether they are over-responsive or under-responsive to sound ((Brandes-Aitken *et al.*, 2024). As a result, the early years environment can either support or overwhelm children's social and emotional development (Tamblyn *et al.*, 2023). These differences in how children experience noise can be understood through different models of disability, the medical model and social model. From a medical model perspective, these sensory processing difficulties are seen as within the child, linked to how their brain processes sensory input (Miller *et al.*, 2017). Some medical model approaches aim to increase a child's tolerance to sound through structured or gradual exposure. For example, Ayres Sensory Integration therapy provides controlled sensory experiences to support more effective processing over time (Lane *et al.*, 2019). Similarly, graded exposure approaches have been linked to reducing sensory over-responsivity by slowly introducing stimuli in a manageable way (Fodstad *et al.*, 2020). However, this can be criticised for focusing on changing the child rather than adapting the environment. Green *et al.* (2015) highlights that focusing on coping and self-regulation is more important than try to normalise sensory processing differences. The social model of disability states that children are affected by barriers such as attitudes and environments rather than the disability (Lawson and Beckett, 2020), suggesting that environment and attitudes do not meet the needs of children with sensory processing differences. Similarly, a neurodiversity approach to inclusion recognises that children learn and experience the world differently and that settings must adapt environments and practice to support difference (Leinfuss and O'Hara, 2024).

Support strategy

Providing regulation calming spaces supports regulation for children with sensory processing differences (Bray *et al.*, 2025). Sensory-friendly environments are designed to reduce sensory overload by managing things like noise and lighting (Finnigan, 2024). As a result, environmental adaptation may help children manage sensory input and reduce difficulties (Patil and Kaple, 2023). Research supports this approach, as Barrett *et al.* (2015) found that classroom environments, including lighting and acoustics, have a direct impact on learning. Similarly, Ashburner *et al.* (2014) found that when sensory needs are considered in the classroom, children show improve participation and reduced distress. This links to the social model, as it removes barriers rather than placing responsibility on the child. It also fits with the neurodiversity approach, as it supports children to access learning in ways that work for them (Lawson and Beckett, 2020; Leinfuss and O'Hara, 2024). However, Manning, Williams and MacLennan (2023) argue that adaptation should tailored to individual needs. This suggests that it is not as simple as just making a setting calm. For example, some children may need reduced input, while others need more movement or sensory input to regulate. Additionally, Lack of resource can be practical in classroom (Al Jaffal, 2022), which suggests that due to limited time, space and materials, practitioners may struggle to consistently adapt learning environments. Although, Mitchel (2023) states that manageable strategies and a whole school approach through universal design for learning can support more inclusive practice.

Conclusion

In summary, sensory processing differences affect how children experience and engage with their environment. While identification provides insight, limits in diagnosis can impact access to support. The impact of barriers highlights the importance of both medical and social models. Although some approaches focus on increasing tolerance, adapting environments is often more inclusive. Environmental strategies are most effective when individualised, supporting regulation and ensuring all children can participate.

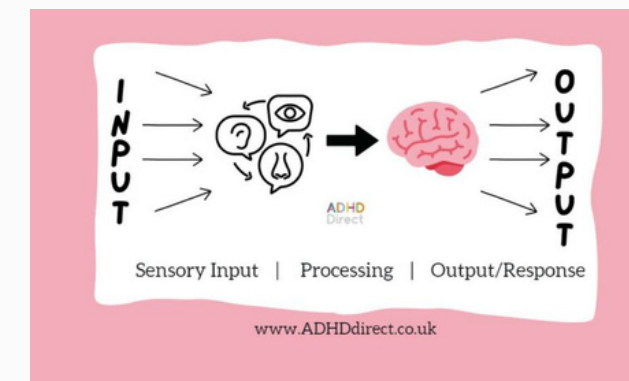


Figure 1: Sensory processing
(ADHD Direct, n.d.)

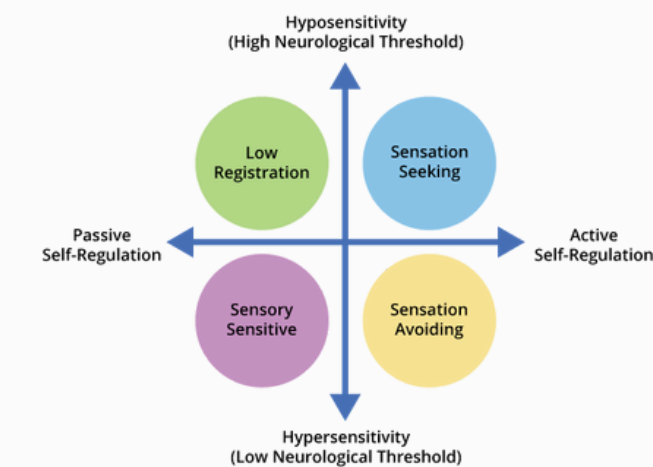


Figure 2: Four patterns of sensory processing
(Realisation Healthcare, n.d.)



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