Sensory modulation



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Introduction

Many individuals with trisomy 21 may exhibit behaviors related to difficulties with sensory modulation.

Throughout the day, we receive a multitude of information from our environment. All of our senses are involved: touch, vision, hearing, taste, smell, as well as proprioception (awareness of body position) and the vestibular sense (understanding body movement). Humans react to the sensory information they receive, and the behaviors produced are generally consistent with the type of sensations experienced. For example, if we pick up a cup that is too hot, we will instinctively put it down without thinking.

For some individuals, the interpretation of sensory input may not be properly modulated for the situation at hand; in other words, they have difficulties with sensory modulation. Several profiles can be observed, including hyperreactivity, hyporeactivity, and hypervigilance, which will be discussed in more detail. It is possible to observe a combination of multiple profiles in the same person, and reactions may vary depending on the situation.

Given this wide variability, it is especially important to recognize if a person is sensory-sensitive. This awareness will help better respond to needs that may be hidden behind challenging behaviors.



Signs and Symptoms of Hyperreactivity

The person often expresses significant discomfort that prevents them from continuing their activity. The interpretation of the stimulation is more intense than what the situation would suggest for most people. For example:

- Cannot tolerate clothing tags (perceived as pins in the garment).
- Dislikes mixed textures in the same dish (pieces of fruit in yogurt are perceived like a bone in a piece of chicken).
- Covers their ears when a parent is vacuuming (perceived as the sound of fireworks).
- Shows disgust toward cooking smells (perceived as rotten food).

Signs and Symptoms of Hyporeactivity

The person is often lethargic. Usual stimulations are generally not enough to activate them or allow participation in the ongoing activity. They therefore seek more intense sensory input. For example:

- Does not react when bumped or falls.
- Fills their mouth completely when eating, because a normal bite is not enough for them to feel the food in their mouth.
- Enjoys unusual smells, such as the scent of compost.

Signs and Symptoms of Hypervigilance

The person notices the slightest sound or movement around them. They frequently interrupt their activity to identify the source of these stimuli. Although they are not frightened by these distractions, they divert attention from their play, meal, or ongoing activity. For example:

- Notices the doorbell every time it rings.
- Asks which vehicle is making the sound: fire truck, ambulance, truck, police, motorcycle, etc.
- Looks for the dog barking when at the park.
- Stops playing when someone moves nearby.
- Consistently notices birds and squirrels during walks.

Signs and Symptoms of Sensory-Seeking Behaviors for Self-Regulation, Regardless of Profile

Some individuals will engage in behaviors they cannot control. For example, fidgeting in their chair during a meal, chewing on clothing, enjoying hiding under a pile of cushions, or letting themselves fall to the floor, etc. **These behaviors are ways of seeking proprioceptive, vestibular, or oral stimulation. Such types of stimulation are known for their calming effect and their ability to support nervous system self-regulation.** However, some individuals may adopt inappropriate behaviors even if they find them comforting. For example, a child over 2 or 3 years old who chews on objects. It is then important to help them find suitable alternatives to satisfy their need to chew, such as offering a chewable necklace or a water bottle with a straw.

Here are some strategies to try to better manage sensory challenges. These strategies can be suitable for all sensory profiles.

The person often expresses significant discomfort that prevents them from continuing their activity. The interpretation of the stimulation is more intense than what the situation would suggest for most people. For example:

- Firm-pressure massages (with or without cream)
- Vibrating massages (using a small vibrating massage device, often available at pharmacies)
- Allow the person to hold and place a weighted "magic" bag or stuffed toy on themselves
- Create and offer an enclosed space (e.g., a children's tent)
- Provide a rocking chair suited to the person's size
- Use a balance board to rock back and forth
- If possible, gently swing your child in a blanket held by two adults
- Move around performing "animal walks" that engage large muscle groups
- Use noise-canceling earmuffs or earplugs to reduce sound

Each person reacts differently depending on their needs and interests. It is important to keep in mind that these activities should take place in a fun and friendly atmosphere in order to be effective.



Other Sensory Behaviors That May Be Observed

Some individuals will seek out specific types of stimulation that are generally associated with a sense of well-being for them. For example:

- Watching raindrops slide down the window
- Watching a string they make move
- Spinning around
- Trying to reproduce a specific sound, such as a toilet flushing

The person may engage in these activities for long periods, find them enjoyable, and sometimes have difficulty stopping. These behaviors could be part of a broader profile of sensory particularities, as can be observed in individuals diagnosed with autism spectrum disorder (ASD). This type of sensory particularity is discussed in more detail in our guide:
The Dual Diagnosis: Down Syndrome and Autism Spectrum Disorder (in french)

Conclusion

To further explore the suggestions provided above, we encourage you to contact a professional (occupational therapist and/or psychoeducator) to identify strategies that are tailored to your child's unique profile.

It is essential to remember that, even if the behavior may seem inappropriate or the reaction appears disproportionate to what you observe, the person is genuinely experiencing that emotion, and it is important to acknowledge it.

If you wish to continue your reading, you will find additional strategies and various references on this topic in the **Resources** section.



Resources and bibliography

Sensory Processing 101
Dayna Abraham, Claire Heffron, Pamela Braley & Lauren Drobnjak
An easy-to-understand guide that explains how sensory processing works and how it can affect a child's daily life. A great place to start for parents.
sensoryhealth.org

The Out-of-Sync Child: Recognizing and Coping with Sensory Processing Disorder
Carol Kranowitz, M.A.
A very popular and reassuring book that helps parents understand sensory challenges and offers practical strategies for home and school.
emergepediatrictherapy.com

Sensational Kids: Hope and Help for Children with Sensory Processing Disorder
Lucy Jane Miller
A more in-depth book that combines science, real-life stories, and helpful ideas to support children with sensory differences.
emergepediatrictherapy.com

Parenting a Child with Sensory Processing Disorder: A Family Guide to Understanding and Supporting Your Sensory-Sensitive Child
Christopher R. Auer, with Susan L. Blumberg
A practical guide written for families, offering clear explanations and everyday strategies to support a sensory-sensitive child.

ONLINE RESSOURCES

Down Syndrome Resource Foundation (DSRF)
Sensory Processing and Physical Skill Development
A helpful webpage explaining how sensory processing can influence movement, coordination, and physical development.
https://dsrf.org/resources/information/physical-skill-development/sensory-processing/

Down's Syndrome Association (UK)
Sensory Processing Differences – Factsheet
A clear and easy-to-read factsheet explaining sensory processing differences in children with trisomy 21.
https://www.downs-syndrome.org.uk/wp-content/uploads/2025/05/Sensory-Processing-Differences-Factsheet_FINAL-VERSION_14.05.25.pdf


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