

About Sensory Integration

Sensory processing is so important because the senses are how we get all information from our environment to our brain. Therefore, sensory information and the way we interpret it are critical in all aspects of our development and behavior. Before we jump into information about sensory integration, here is some background on the **8** senses:

Sense	Definition
Sight (visual)	Information we see through our eyes; Light is turned into shapes and color.
Sound (auditory)	Our ears turn vibrations into sound; We must determine the volume, pitch, tone, and location of the stimuli.
Touch (tactile)	What we feel on our skin; information about pressure, texture, temperature, pain, dry, wet, etc.
Smell (olfactory)	Receptors in our nose determine what odors we smell. This sense is closely linked to memory and emotional reactions in our brain.
Taste (gustatory)	Receptors on our tongue give us information about the flavor of what we put in our mouth (salty, sweet, bitter, sour, savory).
Vestibular	This sense is based in our inner ear and helps us with balance and the movement/ direction of our head in space; this is important for awareness of body position, posture, and tolerance of movement.
Proprioception	Receptors in our muscles/ joints help us determine where we and each of our body parts are in space;

	this sense is crucial for motor planning and motor learning.
Interoception	All input from stimuli originating inside the body; examples of interoceptive information are hunger, thirst, body temperature, heart rate, tiredness, etc.

What is Sensory Integration?

Sensory Integration in occupational therapy refers to the brain's ability to take in, process, and correctly interpret sensory information. When the brain interprets sensory information, it provides a response that can typically be observed as behavior. If a child struggles with sensory integration, their brain has difficulty processing sensory information into correct responses.

Example:

Organized sensory integration

John hears a loud, sudden noise → signals tell his brain that he hears a loud noise → John jumps

Disorganized sensory integration

John hears a loud, sudden noise → signals tell his brain that he is in pain → John begins to cry

What Difficulties in Sensory Integration May Look Like

The out-of-synch child, by Carol Stock Kranowitz, M.A. (1998), provides helpful information for parents on determining whether or not your child may have difficulty with sensory integration and what to do about it. Below is a chart adapted from this book that describes some common signs of sensory integration dysfunction. For it to be true dysfunction, Stock Kranowitz explains that the following behaviors must occur with frequency (more often than expected), intensity (stronger reaction than expected), or duration (lasts longer than expected) (Stock Kranowitz, 1998):

Oversensitive (seeks less input)	Sensory System	Undersensitive (seeks more input)
<ul style="list-style-type: none"> • Avoids being touched • Has strong/ emotional reactions to getting messy • Avoids or reacts to certain clothing materials, food textures, light touch, etc. 	Touch	<ul style="list-style-type: none"> • Seems unaware of pain or temperature changes • Chews on inedible objects • Bumps into people or objects frequently • Unaware of messes or spillage of food or drink
<ul style="list-style-type: none"> • Avoids moving or being moved • Seems nervous when tipped off balance • Gets motion sickness easily • Does not enjoy running, jumping, or climbing 	Movement	<ul style="list-style-type: none"> • Frequently spinning, swinging, rocking, etc. • Does not seem to ever get dizzy • Constant movement and fidgeting • Frequently climbs or hangs upside down
<ul style="list-style-type: none"> • Appears overly stiff or rigid • Struggles with coordination • Avoids some playground activities and games that require body awareness 	Body Position	<ul style="list-style-type: none"> • Often slumps and slouches • Frequently bumps into objects or stomps feet • May demonstrate clumsy or inaccurate motor actions
<ul style="list-style-type: none"> • Overexcitement with lots of colors, lights, or other visual stimulation • Often covers eyes or has poor eye contact • Overreact to bright lights • Poor visual attention when working 	Sights	<ul style="list-style-type: none"> • May touch everything when looking at it • Misses important visual cues • Has difficulty understanding facial expressions • Has increased difficulty with learning shapes or signs
<ul style="list-style-type: none"> • Often covers ears or needs noise-cancelling headphones • May be bothered by 	Sounds	<ul style="list-style-type: none"> • Seems to ignore name being called • Difficulty following verbal directions

<ul style="list-style-type: none"> noises that others do not notice Has strong emotional reactions to loud noise 		<ul style="list-style-type: none"> Speaks in a loud voice Prefers loud volume of music and/ or TV
<ul style="list-style-type: none"> Appears to avoid or object to odors that others do not notice 	Smells	<ul style="list-style-type: none"> Does not appear to notice unpleasant odors that others notice Frequently smells things
<ul style="list-style-type: none"> Strongly dislikes certain foods or food textures/ temperatures Often gags when eating 	Tastes	<ul style="list-style-type: none"> Frequently licks or mouths inedible objects Prefers hot or spicy foods

What Can Treatment of Sensory Integration Dysfunction Do?

Treating present sensory dysfunction can help with the following:

- Your child's ability to correctly process sensory information
- Your child's ability to use their sensory systems together
- Your child's foundation for learning
- Your child's social and interpersonal skills
- Your child's emotional regulation and wellness
- Your understanding of your child and the way their brain works

What Should I Do As a Parent?

1. Talk to your primary care physician.

If you do not currently have an occupational therapist, tell your physician about your concerns and ask about an occupational therapy referral.

2. Talk to your occupational therapist.

If your child currently has an occupational therapist and you are concerned that this is not being addressed, talk to them about your concerns. Your OT should then provide your child with an assessment to determine their sensory processing needs if they have not done so already.

3. Keep your child's nervous system as regulated as possible.

When our sensory systems are dysregulated, we are not able to learn new information. See the [“Examples of Sensory Activities”](#) page for more information on how you may incorporate sensory activities at home. However, it is always recommended that you consult a professional for guidance if you notice that your child may have sensory integration dysfunction.

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References

- Dunn, W. (2014). *Sensory Profile, Second Edition: User's Manual*. Bloomington, MN: Pearson Clinical Assessment.
- Parham, L. D., & Mailloux, Z. (2020). Sensory integration. In J. C. O'Brien & H. Kuhaneck (Eds.), *Case-Smith's occupational therapy for children and adolescents* (8th ed., pp. 516-549). Elsevier Inc.
- Stock Kranowitz, C. (1998). *The out-of-synch child*. Berkley Publishing Group.