

# Guide to Sensory Processing



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## Sensory Processing

In order to understand what is going on around us, we need to organize all of the incoming sensory information (Ayres, 2005). The sensory information involves what we see, smell, taste, hear, feel on our body, where our body is in relation to others, and how well we are balanced. This is a lot of information that our brains need to process in order to engage in productive behavior, learn, and form accurate perceptions.



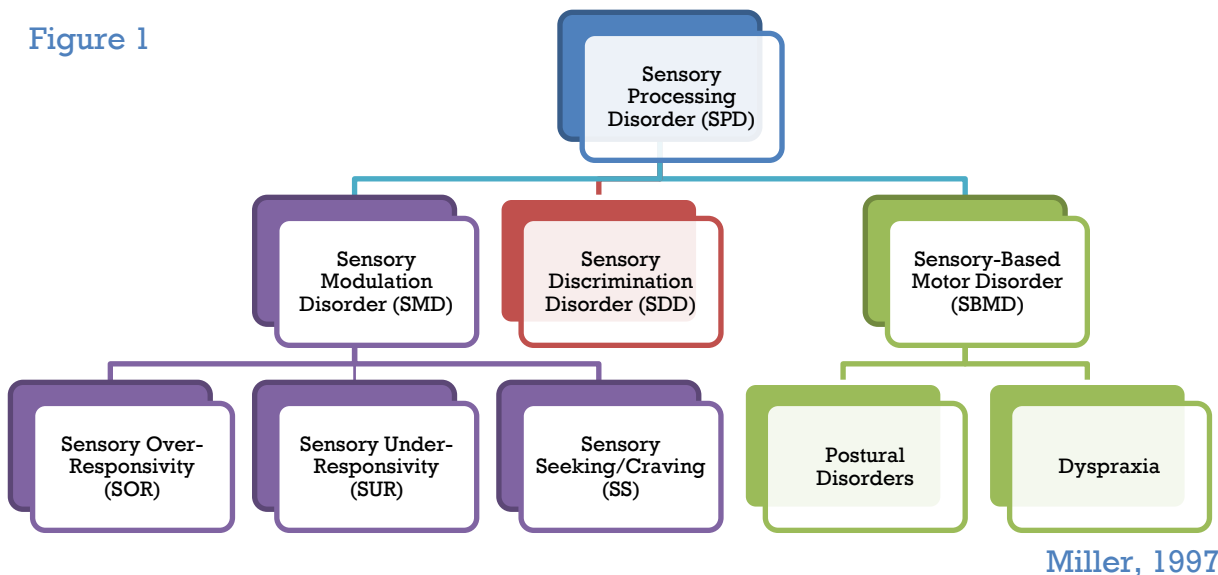
## Sensory Processing

Jean Ayres developed the *sensory integration* (SI) theory. SI gives meaning to what our senses are recognizing. When the sensations are not being organized properly in the brain, Ayres compared it to a traffic jam. The traffic jam of sensory information can lead to learning difficulties and problem behavior (Ayres, 2005). Children with *Sensory Processing Disorder* (SPD) are struggling with this traffic jam.

Sensory processing is a dynamic and complex theory. Ayres was the pioneer of the sensory processing field who created a theory in which research scholars, such as Winnie Dunn, and Lucy Miller, who expanded the sensory processing model. As you research more about what SPD is, in regards to your child, you

may notice some of the same qualities about yourself. It is important to remember that everyone has some quirks about their sensory processing whether it be a sensitivity to loud noises or dislike of light touch. However the identification of SPD is reserved for individuals whose sensory quirks are outside of the typical range and affect their daily functioning (Miller-Nosology). Figure 1 provides an organization for SPD. For these individuals, they are constantly being bombarded by different sensory input which can be confusing or upsetting. Typically developing children can have sensory processing difficulties along with children with other diagnoses such as ADHD,

Figure 1



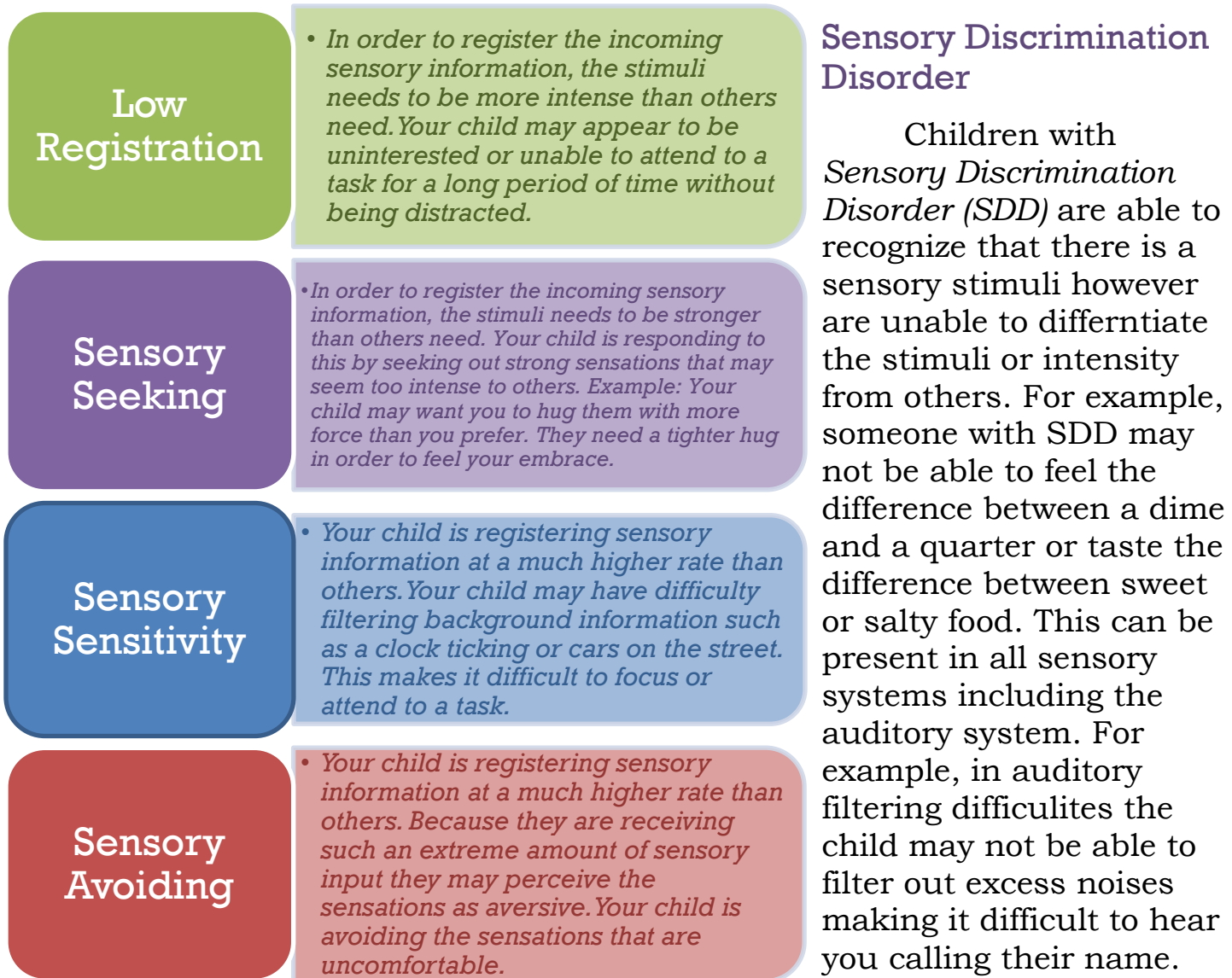
## Sensory Modulation Disorder

*Sensory Modulation* refers to the ability to provide an appropriate response to sensory stimuli. When children have *Sensory Modulation Disorder (SMD)*, they may respond in an inappropriate way to the stimuli. When a child is *Sensory Over-Responsive (SOR)* they may respond to the someone brushing up against them in the hallway by becoming overly upset and/or running away. This is because their brain is not processing the incoming tactile sensation of someone touching them properly and therefore their response to the stimuli is not appropriate. SOR can also be described as *sensory sensitivity* or *sensory avoiding* as in Dunn's Theory of Response shown in Figure 2.

A child who is *Sensory Under-Responsive (SUR)* may be late to class because they did not hear the school bell ring at all. In clinical practice it has been found that children with SUR sometimes have difficulty acknowledging pain because their brain is not properly registering the sensory information of pain in their brain. SUR can also be described as low registration, as in Dunn's Theory of Response shown in Figure 2.

Children who are *Sensory Seeking/ Craving (SS)* may seek out excessive touch such as a lot of hugs because they

enjoy intense sensory stimuli. When your child is seeking sensory information we can compare it to food. When you are hungry it is difficult to concentrate on anything else except for finding something to eat. This scenario is exactly how your child is feeling regarding sensory information. SS is also described in Figure 2 from Dunn's Theory of Response.



## Sensory Discrimination Disorder

Children with *Sensory Discrimination Disorder (SDD)* are able to recognize that there is a sensory stimuli however are unable to differentiate the stimuli or intensity from others. For example, someone with SDD may not be able to feel the difference between a dime and a quarter or taste the difference between sweet or salty food. This can be present in all sensory systems including the auditory system. For example, in auditory filtering difficulties the child may not be able to filter out excess noises making it difficult to hear you calling their name.

Figure 2

## Sensory-Based Motor Disorder

Children with *Sensory Based Motor Disorders (SBMD)* have difficulty with movement due to inaccurate sensory processing and motor planning. When children are unable to stabilize their body in response to the demands of the environment, they may have a *Postural Disorder (PD)*. We can relate to children with PD, for instance when riding the train, we have to consciously think about maintaining our balance due to the unexpected movements.

*Dyspraxia* is the inability to plan and execute a movement. This can be displayed in regards to fine motor (difficulty forming letters), gross motor (difficulty climbing into a swing), or in oral motor (difficulty organizing chewing and swallowing foods). Each of the areas that can be affected by dyspraxia can disrupt daily functioning.

## Examples of SPD Behaviors

### Tactile

- SOR: When someone brushes up against child in passing, they perceive it as someone pushing them and may cause an inappropriate response (hitting).
- SUR: Child may hug tighter than your other children because otherwise they cannot feel it.

### Oral

- SOR: Refuses toothbrush or silverware
- SUR: Chews on toothbrush; Bites self or others

### Vestibular

- SOR: Cries or avoids swings and slides
- SUR: Jumps excessively; Hangs upside down

### Auditory

- SOR: Covers ears in crowds or when school bell rings
- SUR: Does not hear/respond to name being called

### Proprioceptive

- SUR: Slams doors or stomps feet not caused by tantrum; Runs into walls; Crashes onto floor

### Sight

- SOR: Sensitive to light/colors; Becomes upset when visually too many things going on
- SUR: Seeks bright colors

### Smell

- SOR: Often upset by smell
- SUR: Loves strong smells such as perfumes and lotions

## The Occupational Therapist's Role

Occupational Therapists are trained to analyze the sensory systems from a neurological, psychosocial, behavioral, and cognitive perspective as it applies to the child's daily functional living skills. Sensory integration is a specialization in OT practice, in which practitioners focus specifically on how sensory processing challenges are interfering in the child's daily living. The therapist chooses specific activities that provide an appropriate challenge for the child's individual needs. Treatments are designed to improve sensory processing abilities such as dyspraxia (motor planning difficulties), discrimination, or sensory modulation that may result in challenging behaviors (such as tantrums involving hitting, biting, or banging head).

Choosing dynamic activities for your child to engage in will promote the "just right" challenge and will facilitate adaptive behavior. For example, kneeling on the platform swing and throwing beanies into the basket. This activates the vestibular, proprioceptive, and visual system all at one time. Similarly our daily routines require us to use multiple systems at one time. Such as climbing stairs or playing basketball. OT's trained in this specific area incorporate a multi-sensory model approach in their treatment.

The University of Illinois Hospital provides this specialized multi-sensory approach and other complimentary treatments such as Therapeutic Listening, Wilbarger Brushing Protocol, Sensory Diet, and the M.O.R.E. Technique. Not only are we providing direct treatment but also home programs (sensory diet) that are tailored to the child's individual sensory needs that caregivers will carry out in the home. UIH is also willing to coordinate with your child's school to increase success in the classroom.