



Understanding Sensory Processing Disorders and Its Subtypes

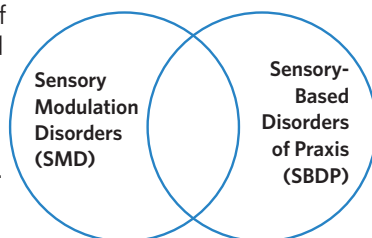
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When children have unexplained emotional outbursts or behaviors that seem obsessive, unusual or extreme, the possibility exists that a Sensory Processing Disorder (SPD) may be present. A child with SPD finds it difficult to process and act upon information received through the senses, and this creates challenges in performing countless everyday tasks. Uncoordination, behavior problems, anxiety, depression, school failure, and other impacts may result if the disorder is not treated effectively.

What is a Sensory Processing Disorder?

Sensory processing refers to the way the nervous system receives messages from the senses and turns them into appropriate motor and behavioral responses. Whether you are playing with a peer, riding a tricycle, eating a sandwich or reading a book, your successful completion of the activity requires processing a variety of sensory information in order to make an appropriate response. The sensation referred to here comes not only from the five senses one typically thinks of (vision, hearing, smell, taste, and touch), but also includes the other overlooked senses: the vestibular sense which gives us information about our head position and motion, and the proprioceptive sense which provides information about our body position in space via receptors located in our muscles and joints. When there is a disruption in the processing of sensory information, children are unable to make appropriate movement, attentional, emotional or behavioral responses. When the deficits become so severe that it impacts a child's ability to cope or function, it is referred to as a Sensory Processing Disorder (SPD). Behaviors frequently observed in children with SPD are varied and extreme, depending on the type of SPD they have. Reduced attention, inability to cope and adjust to change, intolerance to clothing, fear of particular noises, tantrums that are excessive in nature, clumsiness, and purposeful crashing and falling are just a few of the symptoms that can occur as a result of a SPD.

Sensory Processing Disorders can be divided into two main sub-types: Sensory Modulation Disorders (SMD) and Sensory-Based Disorders of Praxis (SBDP). Many would argue that other subtypes exist, however most SPDs fall into one of the categories identified below. As you can see from the



diagram, these two main types of SPDs overlap considerably in many individuals and can often be confused with, or co-exist with, other diagnoses.

Sensory Modulation Disorders (SMD) and Regulatory Disorders

Sensory modulation refers to the brain's regulation of neural messages, facilitating or inhibiting responses to sensory stimuli as required for particular situations. When modulation is intact, the nervous system responds to some stimuli while ignoring other stimuli. This action enables the individual to automatically respond or adapt in response to stimulation. Most of us generate responses to sensory stimuli that are graded in relation to the importance of incoming sensations. Our highly sensitive central nervous system easily balances what is important to attend to or what to ignore. However children with SMDs often lack the ability to adapt or regulate their behavior appropriately to environmental demands and either over-respond or under-respond to the sensory stimuli present. Sensory modulation disorders have an impact on our automatic central nervous system and can affect sleeping and eating patterns, emotional responses and social skills. There are three main types of (SMD):

Sensory Under-Responsiveness: Children with sensory under-responsiveness often need additional sensory input to register, or be aware of, what other children perceive normally. They are often accused of not paying attention or they may participate in sensory seeking behaviors such as moving, running, or fidgeting to maintain a normal central nervous system state of arousal. These children usually respond to a process-oriented approach which targets the underlying sensory systems through participation in specific sensory experiences and modification of the environment.

Sensory Over-Responsiveness: Children with sensory over-responsiveness have an inability to inhibit irrelevant sensory stimuli or over-respond to stimulation. Extreme cases of sensory over-responsiveness may be referred to as sensory defensiveness. These children over-react, or are threatened by, stimuli that most individuals would find non-threatening. In extreme cases, ordinary sensory stimuli may be perceived as painful or frightening. Children with sensory over-sensitivity are often in a constant state of "fight or flight" as their nervous system is in a heightened state of "alert." Their over-response to stimulation is not willful, but is an automatic, unconscious, physiological reaction to sensations. In addition, sensory stimulation often has a cumulative

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effect, thus a sudden, exaggerated response may occur to a seemingly trivial event. These children usually respond well to intervention that utilizes a process-oriented approach which aims to treat the underlying sensory systems involved, while at the same time, utilizing a task-oriented approach which aims to improve specific skills through teaching and practice.

Sensory-Seeking: Children who are sensory-seeking have an insatiable desire for sensation as they actively seek out experiences that provide high intensity of stimulation. Active sensory-seeking often leads to socially unacceptable or unsafe behaviors such as continual mouthing of objects, frequent and purposeful crashing, or inability to respect social boundaries. Unlike children who are sensory under-responsive and engage in sensory-seeking behavior to meet their need for added stimulation, for true sensory-seekers, their participation in activities that provide a high intensity of stimulation does little to meet their need for stimulation. Sensory-seekers respond best to a task-oriented approach which aims to improve and refine specific skills needed through teaching and practice.

Sensory-Based Disorders of Praxis (SBDP)

Children with SBDP have the same characteristics as children with sensory under-responsiveness noted above, but in addition, have deficits in praxis. The word praxis means “based on will.” The prefix “dys” refers to dysfunction. Children with dyspraxia have difficulty performing motor tasks with perceived effort. Children with dyspraxia can develop adequate motor skills with practice however they lack the instinctive know-how in performing a *new or novel* motor challenge.

SBDP are typically a result of sensory under-responsiveness of the vestibular (movement) and proprioceptive (body position) sensory systems. In severe cases of SBDP, the tactile system may also be involved. As a result children with this disorder usually have low muscle tone and have difficulty stabilizing their body to meet the demands of the environment. It is characterized by inappropriate muscle tension and inadequate control of movement resulting in poor postural control. Postural control is needed to provide a stable, yet mobile base for refined movement of the head, eyes and limbs which develops as a result of integration of vestibular, proprioceptive and visual sensory information. When postural control is poor, children often slump when standing or sitting. They may also exhibit difficulty maintaining or adjusting their body position so tasks can

be performed efficiently. Children with SBDP need intensive vestibular and proprioceptive sensory input to maintain normal muscle tone and alertness during seated tasks.

Usually SBDP is not detected in infants or toddlers because their sensory under-responsive nature makes them good babies who make few demands on caregivers. Additionally their motor developmental milestones are typically achieved within age expectations, although usually at the later end of normal. However, as they approach school age, the opportunities for participation in frequent movement decrease while at the same time expectation for refined motor control such as writing, ball skills, or riding a bike increase. Children with SBDP are typically aware that they struggle compared to their peers and they may avoid activities they fear they will perform poorly with. They may also develop other compensatory strategies, such as acting like the class clown, as a way to divert attention away from their perceived inability.

Diagnosing Sensory Processing Disorders

Diagnosing SPD can be challenging and complex as children often fluctuate between sensory under-responsiveness, seeming sluggish and inattentive, to being over-responsive and unable to cope with ordinary environmental demands, rarely achieving a quiet, calm state of alertness.

Accurately diagnosing a sensory processing deficit often requires time in order to observe behavioral and motor responses to a variety of environments and to different types of stimulation. Additionally, sensory processing disorders are often confused with and/or coexist with other disorders including but not limited to autism, gastrointestinal disorders, obsessive compulsive disorders, attention deficit disorder, learning disabilities, hypotonia, and developmental coordination disorder.

To determine if your child’s behavior, learning, attention or coordination difficulties may be a result of a sensory processing deficit, an evaluation by an occupational therapist with advanced training in the evaluation and treatment of children with sensory processing deficits is necessary. Sovereign Pediatric Therapy has occupational therapists with this training and experience. If you are unsure if your child would benefit from an evaluation, a free screening offers an opportunity for you to meet with one of our experienced therapists to determine the need, or lack of need, for an evaluation.

For questions regarding this article or a list of references, please contact the author at ddenniger@sovrehab.com.



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