



Sensory Modulation Disorder: Education and Intervention

Sensory Modulation Disorder (SMD) is a subtype of Sensory Processing Disorder (SPD).

In this Fundamental, learn to recognize SMD by identifying common signs and symptoms. Two approaches to intervention are presented as well as resources to support them.

Finally, discover relevant continuing education opportunities.





What Is Sensory Modulation?

- Sensory modulation is a specific component of sensory processing and relates to the brain's ability to respond appropriately to the sensory environment and to remain at an appropriate level of arousal or alertness.
- For instance, while reading this article, ideally your brain is prioritizing the words on the page (visual input) while inhibiting input from other sensory systems, such as the feel of your body weight on the chair, or non-relevant sounds in your environment.
- This allows you to focus. If you are struggling with modulation at the moment, you may find yourself re-reading portions of the article or using strategies such as fidgeting with a pen to redirect your attention.
- Sensory modulation, in a nutshell, is what allows you to focus on what is most important at the moment.

Three primary types of SMD are

- over-responsivity
- under-responsivity
- sensory craving

SMD may impact all eight of our sensory systems. Very few people are over- or under-responsive to input from all sensory systems. Rather, most of us have a mixed response in that there are a few forms of sensory input we are over-responsive to while being under-responsive or craving other forms of sensory input.



Sensory Over-Responsivity

Over-responsiveness is an exaggerated response of the nervous system to sensory input. For example, people who easily get motion sick are over-responding to vestibular input (the sensation of movement). The nervous system goes into fight-or-flight mode even when no real danger exists. Over-responders need calming forms of sensory input. Slow, rhythmic movements, deep pressure to the muscles and joints, heavy-work activities, peaceful music, dim or natural lighting, and quiet activities are all helpful. Common symptoms include:

- as babies: extremely fussy, startles easily, may seem to dislike light touch, difficult to transition to baby food and away from bottle, delayed motor skill development
- picky eating habits
- clothing issues: doesn't like tags, seams, certain fabrics
- self-care issues: dislikes hair care, nail-trimming, face washing, bathing
- low frustration tolerance, moody, irritable, fussy
- frequent melt downs that are out of proportion to the situation
- easily overwhelmed in noisy, busy environments like birthday parties, school lunch room, restaurants, Walmart, etc.
- dislikes light touch and may be resistant to "messy" play like finger painting or play dough
- as adults: irritable, moody, bothered by noises that other people can "tune-out," picky about foods and clothing, may still dislike touch, bothered by lighting (especially fluorescent), stays away from "busy" environments, may prefer to be alone



Sensory Under-Responsivity

Passive under-responsiveness is a lack of or insufficient response to the sensory environment. Sometimes these children appear to be daydreaming or unfocused on the world around them. They may also be uncoordinated and have difficulty with motor skills development. Passive under-responders need alerting forms of sensory input. Some examples include jumping, bouncing, racing the clock, fast or multidirectional movement, spinning, blow toys, cold items, light tickly touch, and dance music. Common symptoms include:

- as babies: slow to respond to sounds and sights, may be exceptionally “easy,” delayed motor skill development, may have difficulty transitioning to baby food and may seem not to notice being messy or drooling
- food cravings: particularly salty, spicy foods
- may stuff too much food in mouth
- may not notice messy face, hands, twisted clothing
- often appears to be daydreaming or unfocused on what is going on
- asks “what” a lot even when hearing is fine
- may be overweight
- high pain tolerance or may not seem to notice cuts and bruises
- low muscle tone, may slump, slouch, and lean in chair or desk
- toe walking or awkward gait
- clumsiness
- poor fine motor skill development



Symptoms of Sensory Craving

- The nervous system of the sensory craver needs intense input for the sensation to be registered properly in the brain. Therefore, the sensory craver seeks intense sensations frequently. This is caused by under-responsivity.
- However, children who are sensory cravers are attempting to get to the higher level of input they need.
- Passive under-responders are not. Sensory cravers also need the intense alerting forms of sensory input.
- This seems confusing at first, but it makes sense once we realize that what they really need is help getting to that higher level of input they are seeking.
- When a child reaches that level, helpful neurochemicals will be released. At that point, the student will seem calmer or more focused.
- Many of the same activities that are helpful for passive under-responders are also helpful for sensory cravers.
- Typically, the more thrill and excitement involved the better!
- Try to incorporate multiple sensory systems simultaneously such as listening to fast music while going through an obstacle course that involves crawling, rolling, and jumping.



Symptoms of Sensory Craving

Common symptoms of sensory craving include:

- as babies: love movement, love roughhousing, happiest in busy, stimulating environments
- crave salty, spicy foods or extra chewy and crunchy foods
- always in constant motion, may “crash” into walls or floor on purpose
- may toe walk, or may run/jump/skip everywhere rather than walk
- difficulty staying still in seat
- touches everything, may bring everything to mouth
- plays rough
- poor attention span

Note: Meeting the needs of the sensory craver is typically more difficult than meeting the needs of the over-responder or the passive under-responder. Designing an intervention plan typically requires the involvement of a skilled OT with a high level of understanding about sensory modulation.