

What is sensory modulation disorder?

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2020

Background

“Sensory modulation disorder” is also known by a number of other names – sensory integration dysfunction, sensory regulation disorder, hyper-responsiveness, hyper-sensitivity, or hypo-sensitivity.... Many names for a problem that causes children (and adults) to behave in a way that is not completely understood by those around them: why do they avoid certain things? Why is it so hard to put the child’s socks on? Why does he not want to play in the sand? And why does she insist on eating only certain things?

Sensory integration

In order to understand the reason for these behaviors, it is first necessary to understand what sensory integration is, and how it is related to behavior. Sensory integration is a process of receiving sensory stimuli from the environment, processing them in the brain, interpreting the stimuli, and creating an appropriate response. (For further information on the senses, see the article “On the familiar and the hidden senses”)

The hidden senses

Beyond the senses that we are familiar with (taste, smell, sight, hearing, and touch), there are also others that are known as the “hidden senses”. These senses also receive information from the environment by means of sensors, and transmit information to the brain, but unlike the “overt” senses, we are less aware of their existence and function. When they are not functioning properly, we are liable to have difficulties in participating in different tasks in our everyday lives. There are many factors for sensory modulation disorder: different syndromes and developmental disabilities are accompanied by sensory modulation disorder. We very frequently find problems with sensory modulation disorders among children and adults with autism, but it is important to emphasize that sensory modulation disorders may appear among typically developing children.

I will briefly review the “hidden senses” mentioned in the previous article:

The tactile system: this is in fact the “professional” name for the sense of touch. It is our sensory system, made up of sensors located in the skin, the largest organ in our body. Different sensors transmit different sensations – heat and cold, light touch, tickling and the sense of pain. The role of this system is to protect us from dangers (“careful, you’re touching something hot!”), and enable us to identify and distinguish between different stimuli (“soft fur – maybe it’s a cat?”).

The vestibular system: the system of balance, whose sensors are in the inner ear. The system identifies changes in the position of our body by movements of the fluid in the inner ear. When we lose our balance, it transmits information quickly to the brain. In response, the brain causes muscles to contract, in order to activate our body and prevent us from falling. This system enables us to move quickly and confidently while maintaining our balance.

The proprioceptive system: the system that gives us “body awareness”. The sensors of this system are located in muscles and joints, and give the brain information enabling it to know where the different parts of our body are, relative to each other, and relative to space. The same system enables us to use a little or a lot of force, to move quickly or slowly, and to plan the skillful, effective, and appropriate movement to suit the task.

Sensory processing

In sensory processing, the information from all the senses, the familiar and the hidden, passes to the brain and undergoes processing and interpretation – so that we can function with minimum energy and maximum efficiency in the course of the day. If we take a task like writing, we will see that many systems are involved: sight, to identify the written marks, and the lines on which we should write; the hearing system allows us to connect these marks with the sound that they represent; the tactile system enables us to feel the pencil that we are holding and the smooth paper before us; and the proprioceptive system allows us to change the muscle tone in our torso and arm so that we can move our hands in the right direction, with the necessary strength, and at the distance required to create the letters.

Sensory Modulation disorder

But what happens when one of the sensory systems does not function properly? Are any of the following situations familiar to you?

You go to the playground with the toddler, take his shoes off, and sit him down on the sand. Instead of enjoying the sand like the other children, playing with it, digging, building, and feeling it – the child responds with crying and attempts to move away from it. Other situations that will certainly be familiar to some parents are a child

showing a strong dislike to the touch of water on her face in the shower; avoiding eating food with particular smells, tastes, or textures; and insistence on wearing only certain items of clothing, demanding that labels in the garments be completely cut out, complaining that the clothes irritate and itch; and being frightened of certain noises or bright lights.

Another situation that may appear familiar: the child appears to be immersed in his or her own world most of the time, preferring imaginative games over activities like running, jumping, sliding, or swinging; sometimes the response to pain is diminished, and the impression is that the child is quiet and even passive, not interested in the surroundings and not trying to study them. Often he or she will have difficulty learning to hop, ride a bicycle, or imitate movements.

Another child may appear to be constantly searching for “action”: running, jumping, bumping into objects and people, appearing restless, and even as a baby and toddler, needing to be rocked for a long time in order to calm down. When this child is in a quiet environment he or she does not relax, but the opposite – races around looking for “what to do with himself”.

The three children described here may be children with typical development; the difficulty lies in the fact that the sensory systems in their body are not working properly, and are making it difficult for them to function efficiently.

The first description could fit a child who is **over responsive**. Over responsiveness means that the person responds too much, too soon, or for too long to sensory stimuli most people find tolerable. So, for example, the feeling of the sand on the child’s feet is like walking on sandpaper; the seam of the sock feels like a sharp stone in the shoe, and the label on the garment makes him feel as if a spider is walking down his back. This child is involved in “self-protection” throughout the day, because his sensory system is constantly telling him that he is in danger. Such a child is not free to play or learn, because his body is engaged in survival. These children often respond to the situation by trying to control their environment, and the result is behavior that we interpret as stubbornness and lack of flexibility to change. If we put ourselves in the child’s place, we will understand that she is just trying to create a safer environment for herself, without surprises, without unpleasant stimuli, and without the constant need for battle.

The second description fits a child who may be under-responsive. A person who is under responsive may be unaware of sensory stimuli, have a slow response and may respond with less intensity compared to a person with typical sensory integration. He does not try to investigate his surroundings, because he is hardly aware of the changes that take place and the stimuli received from them. It is hard to envision this situation, because we are used to sensing the environment and its stimuli, but try to imagine that the food you eat has hardly any taste, the sounds around you are very muffled, your surroundings are monotonous in terms of color and texture – not just for a short while but over a period of a number of days, weeks, or months. The result

is a child who is “too quiet”, who does not take an interest in his surroundings because they are simply not interesting.

The third situation describes a child who may be a sensory seeker. These children are constantly seeking for sensory systems need intense and prolonged information in order to work properly. They run and jump in order to arouse the I proprioceptive system; they turn on the television or play computer games at full volume in order to arouse the auditory system; they love spicy food that awakens their sense of taste; and may seem very restless in a quiet environment

These descriptions are general, and it must be noted that each child with a sensory modulation disorder will respond differently, according to his or her difficulties and according to the environment. If you feel that your child has difficulty with sensory integration, it is recommended to turn to an occupational therapist for a thorough assessment. Sensory integration and diagnosis of sensory disorders are an area of specialization of occupational therapists, and they have tools for assessment and treatment. Assessment usually includes an evaluation of the child's behavior, either in the OT's clinic or in the child's natural environment; the OT may also give you different questionnaires to be filled out by the parents and the nursery or schoolteacher.

There are different ways of treating sensory modulation disorders. They may include guidance for parents with regard to how to deal with and adapt the home environment to make it easier for the child to function. At the same time, treatment sometimes also includes other therapeutic approaches, one of these being hydrotherapy.