Children's Services
Since 1895

Sensory Processing Guidebook

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What is Sensory Processing?

Sensory processing is the body's ability to effectively register, organise, and accurately interpret and respond to sensory input, both within the body and from the environment.

How Does Sensory Processing Develop?

A newborn baby can see but is not yet able to interpret and respond to visual input. A newborn can hear but cannot effectively interpret and respond to sound information to be able to communicate effectively.

In the early months, babies have a developing sense of sight, however, cannot interpret what they see to derive meaning. Sensory development is tied with many domains, including language development, for the child to apply meaning to the sensory world.

From newborn through to preschooler, the developing body takes time to establish neural and central nervous system pathways.

Individual children's experiences of sensory processing impacts on their development and learning across domains.

Our body learns to interpret sensory input to be able to respond to it. As all bodies and brains are individual, children respond in different ways to the same input.

Some children take longer to establish their sensory system processing and therefore may respond differently to their peers.

The 7 Senses

Our bodies have 5 well-known senses and 2 that are essential, yet less well known.

1. Auditory Sense: is the ability to interpret information that is heard. The middle and outer ears are the receptors that receive sound information about volume, pitch and rhythm.

2. Visual Sense: is the ability to understand and interpret what is seen. The eyes are the sensory receptors that receive information about the contrast of light and dark, colour and movement.

3. Gustatory Sense: is the ability to interpret information regarding taste. The tongue receives taste sensations and detects the chemical makeup of substances to determine if the sensation is safe or harmful.

4. Olfactory Sense: is the ability to interpret smells. The nose receives information about the chemical makeup of particles in the air to determine if the smell is safe or harmful.

5. Tactile Sense: is the ability to interpret information coming into the body through the skin, which has receptors that receive touch sensations like pressure, vibration, movement, temperature, and pain.

6. Proprioceptive Sense: is the ability to interpret where body parts are in relation to each other and in relation to the environment. It uses information from nerves, muscles, and joints to inform about the body's position and movement.

7. Vestibular Sense: is the ability to interpret information relating to movement and balance. The receptors are the semicircular canals in the inner ear. Together with the proprioceptive, tactile and visual senses, they receive information and help the body to interpret movement, balance, speed, change of direction, change of head position, gravity and orientation of the body in space and in relation to the environment.

Arousal States and Sensory Modulation

A child's state of arousal (how alert or lethargic they are) will affect their ability to modulate sensory input (i.e. receive, interpret, process and respond to sensory input).

Our body seeks to sustain appropriate arousal levels through movement and rest in order to maintain the right level of alertness to complete tasks. For example, we need to be able to concentrate to receive instructions and follow them, as well as be able to 'switch off' at rest time.

The body's ability to modulate (go up and down in arousal levels) will be affected by the child's stage of sensory development.

Children in the preschool years do not yet have fully established sensory development and therefore may require support to modulate their sensory processing needs.

What is Efficient Sensory Processing?

When children have efficient sensory processing, they demonstrate appropriate responses to their body's sensory processing, as well as to the environment around them. Children show these responses in the following ways:

- Develop appropriate skill mastery
- Understand behavioural expectations and can display these
- Have appropriate arousal levels for the task at hand
- Can self-regulate (control their physical activity, emotional and cognitive responses) in a variety of different contexts
- Develop social skills and friendships

Development and Sensory Processing

Sensory development is affected by other areas of development. For a child to efficiently establish the neural pathways required to respond to sensory input, understand their body and reactions to the environment, they also need to be developing in all other domains.

Some factors that will impact a child's sensory development include the following:

- Language, communication, and social skills
- Cognitive skills
- Gross motor and fine motor skills
- Emotional regulation development
- Amount of exposure to different situations through their family and community

Emotional Regulation and Sensory Processing

Children develop an ability to regulate their own emotions and understand the emotions of others at different rates. Some children who also have other vulnerabilities or differences in early development may present with emotional regulation difficulties beyond the age that is often viewed as 'typical'. These children may include those with autism, attention deficit hyperactive disorder, developmental delay, or those with a history of trauma.

In some cases, a child's ability to regulate their emotions may be impacted by the sensory environment or their own sensory processing. However, at other times, dysregulation can be due to other factors, including a gap in other aspects of skill development (such as delayed receptive and/or expressive language, or limited social skills). Determining what the behaviour is communicating, is critical to knowing how best to support these children.

Some Indicators of Sensory Processing Differences

Everyone is different in their sensory processing. However, some children have processing abilities that are different to what is considered age appropriate.

These differences may present in the following ways:

- Variable arousal levels (how alert or tired they seem)
- Variable attention to tasks
- Difficulties in understanding appropriate behavioural expectations and demonstrating these
- Being overly active
- Being lethargic
- Difficulty learning and retaining learnt skills
- Low tolerance to being in a large group
- Difficulties forming and keeping friendships
- Anxiety in some situations
- Avoiding play with certain substances
- Avoiding play in certain areas
- Emotional regulation differences

Specific Sensory Processing Patterns

Children with sensory processing that is different to same aged peers will often demonstrate specific sensory processing patterns, which will result in either engaging in, or avoiding certain situations, depending on whether they seek or want to avoid the sensory input involved. In general, the four major sensory processing patterns, are defined by *The Sensory Profile 2, (Dunn).*

1. Sensory seeking

Children who present with sensory seeking behaviours are driven by an internal need to feel 'just right'. Children may want to touch certain textures, see certain visual stimuli or move a great deal. However, too much sensory input can lead to overload and children may present with behaviours such as crying, tantrums and meltdowns.

2. Sensory avoiding

Children who avoid sensory stimuli perceive such input to be confronting. They may only need a small amount of sensory input for their discomfort to register. These children ACTIVELY engage in behaviours to avoid certain sensations. For example, a child may appear to be disengaged around others, but may be working hard to avoid a particular type of sensory input (such as touch). This could lead to reduced social engagement.

3. Sensory sensitive

These children react strongly to certain sensory input. Unlike the sensory avoidant child, they may NOT know how to ACTIVELY avoid and therefore experience higher levels of discomfort or distress, or even experience sensory input as pain.

Some examples include difficulties tolerating certain foods; different clothing textures; or loud environments. For these children, adults around them often modify their sensory exposure, however, it is important that over time, these children are supported to learn how to take action to make themselves feel comfortable.

4. Sensory bystanders

This term describes children who often miss sensory cues. They may take longer to understand social situations or to learn new skills as they may not be paying attention to the important parts of the instruction or activity.

These children are often described as passive and may be at risk of social isolation and delayed skill development. They often require intentional teaching through multisensory input for them to be able to pick up on the cues needed to understand what is happening in their environment.

Specific differences with Sensory Processing

Children with sensory processing differences display sensory behaviours more than their peers, or less than their peers. Their sensory processing patterns are different in one or more senses, resulting in sensory behaviours. Some examples of these behaviours seen in preschool environments include the following.

Movement Processing

Seeking

- Excessive movement
- Climbing up high
- Jumping from high places
- Swinging or rocking

Avoiding/Bystander

- Being very sedentary
- Watching others play from a distance

Touch Processing

Seeking

- Touching or holding certain textures
- Wearing only certain clothing
- Touching others excessively

Avoiding/Sensitive

- Avoiding groups or lining up
- Avoiding certain clothing textures

Visual Processing

Seeking

- Watching something move or spin repetitively
- Moving their body to seek out particular visual stimuli

Avoiding/Sensitive

- Observing others only from a distance
- Covering eyes in response to certain visual stimuli
- Avoiding movement, light and colour combinations (such as at group time or outdoor play)

Olfactory/Gustatory Processing

Seeking

- Chewing and/or mouthing both foods and non-food items (such as clothing)
- Excessive eating
- Seeking a certain texture of foods (such as crunchy foods)

Avoiding

- A restricted diet
- Distress or avoiding mealtimes
- Not eating at preschool

Auditory Processing

Seeking

- An enjoyment of musical toys and loud activities
- Being loud or making noises to themselves (such as humming)

Avoiding

- Refusing to attend group times
- Avoiding noisy outdoor play

Supporting Sensory Processing Development in Early Childhood Education Settings

Sensory development occurs over time and no two children will develop at the same rate. When children are developing differently to their same aged peers, it is important to respect their sensory preferences. They may not yet be able to process, or may not yet be efficient at processing, the sensory stimuli that they encounter.

It's important to note the following points:

- Respect each child's sensory preferences
- Never force a child to participate in a sensory experience
- Consider sensory development a part of developing abilities in communication, attention, emotional regulation and following instructions.

There are many supportive strategies that early childhood educators can implement to support the development of sensory processing.

1. Environmental supports/adaptations

Providing indoor spaces that are not overwhelming supports efficient sensory processing. This may include increasing soft spaces to dampen noise or providing adequate shading on windows to reduce light.

Outdoor spaces that allow children to move in gross motor play supports their physical development and also provides choices for children who may need to move to an alternative environment e.g. to seek or avoid certain sensory stimuli such as sound, light and physical sensory inputs.

2. Routines and consistency

Establishing routines throughout the day can support children who feel overwhelmed at times due to aspects of their sensory world. Having consistency in the rhythm of the day, with predictable meal times, group experiences and rest times helps children to predict what will happen and when, and to learn strategies to support their ability to participate.

Visual supports help children to have clear information about the routine and play options, as well as the social and behavioural expectations.

3 Supporting Arousal levels

Educators can support children to identify their own levels of alertness by labelling feelings that children may be experiencing in the moment. For example, 'I think you feel tired', 'I think you feel excited', or 'I think you feel frustrated'.

By providing a variety of outdoor gross motor, and more passive indoor play options, educators can help children to understand what activities can assist with changing their arousal levels. Showing children what they can do when they are, for example, tired (rest) or overstimulated ("run it off" or play in a quiet space) can support self-regulation over time.

4 . Addressing Attention

Children who consistently avoid certain sensory stimuli, such as noise, can find attending to some tasks more challenging than their peers (for example group music time). By providing the child with supports (such as noise cancelling headphones), educators can adapt the experience to increase participation.

Some children may be caught up in sensory seeking or avoiding cycles, find it difficult to shift their attention from one activity to another. This is one reason for an 'attention lag', where children may take longer to transfer their focus to a new task or may need repeated instructions to be able to participate.

5. Supporting Skill Mastery

Children who have strong sensory preferences may have developed certain competencies in selected areas. For example, the active child may have developed strong gross motor skills. As a result of their preference for the outdoors, the child may miss cues from educators and peers regarding activities on offer indoors and consequently have reduced exposure and participation.

To support the development of a broader skill set, offering intentional teaching experiences and scaffolding new activities where required, can lead to expanded skills.

6. Respecting Sensory Preferences

Children with specific sensory processing differences require the ability to access sensory preferences or avoid stimuli they find uncomfortable. By providing choice within the environment, educators show children that they respect their choices and needs.

It is important to remember that a child may not need to completely avoid less preferred stimuli. Children may be able to tolerate experiencing the stimuli less-intensely (for example, using paint brushes when finger painting or using tools or gloves for playdough). This allows for increased participation and skill development in a way more easily tolerated by the child.

A note about sensory preferences and choice-making

As indicated, children develop sensory processing at different rates. For some children with sensory processing differences, we may observe restricted patterns of behaviour in relation to their engagement with certain sensory experiences. For example, children who seek out movement constantly, those who like to lie down and watch things spin, or those who like to mouth non-food objects.

Repetitive behaviours may come at the exclusion of engagement in other experiences. It is important NOT to assume that the child knows HOW to engage in other activities on offer and has made a choice.

For some children, this restricted focus has prevented them from developing the skills required to engage in other experiences. As a result, intentional teaching opportunities and scaffolding of new activities by educators becomes critical. Increasing the child's exposure to other experiences enables them to broaden their skill set and make authentic choices based on preference, rather than on a lack of skill competency.

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