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Sensory processing

Every minute of every day we receive sensory information from the environment and within our own bodies. How effectively we process this information affects how we concentrate, behave and respond. Good sensory processing forms the basis of all learning experiences and ability to participate in activities. It enables us to develop skills and behave appropriately in any given situation (see 'Normal variations in children's development').

There are seven senses:

- Hearing
- Sight
- Smell
- Taste
- Touch
- Vestibular (movement and balance)
- Proprioception (feedback from our joints and muscles)

Vestibular

Our movement receptors are located in our inner ear and send information about our position and how we are moving to the brain. If the brain does not process the movement sensation accurately then we may receive too much or too little movement sensation which will affect our behaviour and ability to participate in activities. Our vestibular system matures as we get older which is why young children need a lot of movement and the amount of movement we need generally reduces as we get older, unless there is underlying difficulty processing sensory information.

Proprioception

Our proprioceptive system has receptors located within our joints and muscles which are triggered when they are squashed or pulled apart during movement and this is how our proprioceptive system is developed through childhood (through activities such as crawling, climbing and jumping). It lets us know where our body is in relation to the immediate space around us (body and spatial awareness). It also lets us know how to move our body and how much force we need to use to carry out a task.

When proprioception is processed well, we are able to automatically adjust our body's position and this helps with every aspect of our day e.g. negotiating our way around objects in a room, preventing us from falling out of a chair and manipulating objects such as pencils, buttons and glasses of water!

Very importantly, our proprioception sense helps us to modulate and calm our sensory system so that we can attend and focus and it can be used to help calm at times of stress and anxiety (see 'calming') and compliment other sensory inputs to help attention and concentration (see 'Maximising attention').



A child who is having difficulty processing sensory information may be having difficulties with:

Vestibular

- Child is always 'on the go' more than their peers.
- Child seems to need movement in order to concentrate and attend.
- Child appears to take excessive risks e.g. show no fear when jumping from a big height.
- Child is fearful of movement.
- Child dislikes escalators or lifts.
- Child does not like playing on playground equipment.
- Child may be travel sick.
- Dislike head tilted back e.g. hair washing, rough and tumble.



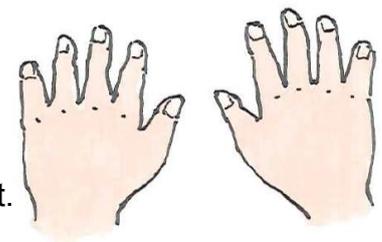
Proprioception

- Appears heavy handed, over forceful, sometimes damaging toys unintentionally.
- Being overly reliant on vision; needing to look at their feet whilst walking up stairs and bumping into others
- Tripping over 'fresh air!'
- Falling off chairs or leaning against objects when sitting on the carpet
- Poor fine motor skills compared to peers – difficulties with precision movements.
- Poor body awareness e.g. difficulty assuming postures in P.E.
- Poor use of force when writing; either too much or not enough.



Touch

- Avoidance of touch.
- Dislike of hugs.
- Child becomes very disorganised, over emotional and/or out of control if they experience games that involve a lot of touch e.g. rough and tumble.
- Over-react to someone brushing past them in the corridor.
- Child avoids messy play.
- Child prefers to wear long sleeves even though it is a very hot day.
- Child dislikes the textures of certain clothes or material on the skin e.g. labels, seams.
- Child dislikes walking barefoot on certain surfaces (grass, sand).
- Appears to have a dulled sense of touch.
- Doesn't register pain or react to cuts or bruises.
- Poor fine motor skills.
- Likes messy play more than most children.
- Seeks touching and fiddling with all objects.
- Doesn't notice if clothes are not tucked in or on straight.
- Doesn't notice if face or hands are messy.



Visual

- Behaviour of child becomes more erratic in a busier more visually stimulating environment.
- Is visually distracted by others.
- Notices everything that's happening in the room.
- Child keeps head and eyes facing downwards most of the time.
- Startle at visual input.
- Shows sensitivity to light and can be irritated by bright lights
- Likes to wear sunglasses/peak cap
- Child may not notice details in pictures.
- Shows a lack of attention to environment/people.
- Often misses visual cues.



Sound

- Child over-reacts to school bells, loud noise, thunder, vacuum cleaner, hairdryer, fire drills or sudden noises.
- Child often places their hands over their ears.
- Child appears less able to concentrate or focus in a noisy environment.
- Child makes own noises more persistently than peer group.
- Shows frequent startle reactions to noise.
- Notices even small sounds or doesn't appear to notice even loud noises
- Child doesn't seem to notice when their name is called.
- Child enjoys and seeks out loud or unusual noises more than peers.
- Has difficulty paying attention in a noisy environment
- Show delayed responses to noise.
- Make noise by tapping, humming, whistling etc.



Strategies and advice

We all process, use and respond to our sensory environment differently and the first step to supporting the child is **acknowledging and understanding this and beginning to recognise how all our sensory strategies help us to cope and interact with our world.** Start to look at the environment and behaviours with a 'sensory perspective' to help identify how we each react differently to different senses and events and in different situations.

Then consider; **does this need to change?**

Just because a behaviour may not conform to social norms, if it is safe, appropriate for the situation and is helping, then why does it need to change? For example, a child who stands during all their lessons because they benefit from the movement and proprioception they gain from it should be allowed to continue.

If the behaviour does need to change as it isn't safe or appropriate then it must be replaced by another activity that provides similar sensory input. For example, a child who is swinging on their chair isn't safe but the child needs the extra movement and so they could be the class monitor, the whole class could carry out regular 'warm up activities' (see 'fine motor warm ups' and 'Maximising attention')

or try using a wobble cushion or a folded piece of paper under the leg of the chair to introduce a natural wobble.

Supporting children who have ‘too much’ sensory input

Some people find it hard to screen out sensory input and get easily overwhelmed resulting in increased stress, anxiety and ‘sensory meltdowns’. These people are often in a state of ‘fight or flight’ which automatically increases sensory sensitivities resulting in a cycle of anxiety impacting on our ability to do the activities that we want and need to be able to do. Introducing predictability and ensuring that the child knows what is happening will help to reduce anxiety and so try the following:

- Provide routine and structure using visuals
- Give warning at times of change by using techniques such as egg timers and dot charts (have 5 dots that can be removed by the adult at varying time intervals controlled by the adult but the child knows that when they are all gone it is time to stop the activity)
- Have a definite end to the task and a clear ‘next’ activity (now/next)
- Use environmental boundaries such as privacy boards and quiet/time out areas

Proprioception – activities involving the use of joints and muscles and deep pressure (see ‘calming’ advice sheet)

Reduce stress by taking out things that cause sensory overload (eg reduce visual clutter, use ear defenders) and increased arousal (eg spinning)

Make sure that the language used is appropriate for the child’s level of understanding and they are able to process the language; if a child is overwhelmed by sensory information they often find it hard to focus on what is being said to them and so it would help to wait for them to calm down before trying to talk to them. Difficulty understanding can also increase anxiety levels.

Once you become more familiar with the child’s sensory reactions and behaviours, begin to observe any signs which may indicate that they may be becoming overwhelmed and intervene with a strategy before their anxiety levels increase and they have a sensory meltdown or ‘shut down’ (some children appear to stop listening or participating when they have too much information to process as this is their own internal ‘time out’)

It’s important to remember that we can respond to non-sensory related stress and anxiety with a sensory reaction and so our sensory behaviours can change depending on our stress and anxiety levels as well as our sensory environment.

Supporting children who don’t receive enough sensory input

People can respond to not having enough sensation in 2 ways

- Unconsciously seek additional sensory information to ‘top themselves up’. See ‘Maximising attention’ to support children where this is happening
- Not respond and so appear quiet and lethargic

For the children who don’t unconsciously seek extra sensory information they will need an adult to provide opportunities to gain this extra information by increasing

sensory input using bright colours, music, movement and noise, introduce change and reduce predictability. See 'Maximising attention' for more ideas.

Supporting children with poor proprioception

Children who aren't able to accurately process sensory information through their joints and muscles often have poor spacial and body awareness and poor judgement of force. They can be overly reliant on their vision, having difficulty carrying out activities with their eyes closed and have difficulty negotiating spaces. They often don't know 'where their body ends and the world begins' and so tend to lean against objects and may not like being in open spaces.

These children benefit from activities described in the following advice sheets:

- 'Playdough' for activities involving resistance of the hand muscles
- 'Core stability' for ideas of activities involving weightbearing through the arms and legs
- 'Calming' for activities involving weightbearing and deep pressure
- 'Fine motor warm ups' for activities to 'wake up' the proprioceptive system before fine motor activities

In order to develop spacial and body awareness:

- Name and touch different body parts with eyes open and closed.
- Reproduce body movements, initially copying, then imitating.
- Movement games e.g. Simon Says, Follow the Leader, Twister.
- Body Wrestling – sitting back to back or side to side with partner and trying to force the partner in that direction.
- Walking/rolling on different textures
- Ball/bean bag target activities – use a heavy ball or bean bag
- Trampoline activities – e.g. bouncing on feet or knees
- Obstacle courses include options of moving over, under, through and around.
- Play "row, row, row your boat" both sitting on the floor, pushing and pulling each other
- Have the child help with "heavy work" activities like pushing a loaded box from one area of the lounge /class to another.
- Help in PE to move mats, hang them up, etc.
- Pretend to be climbing mountains and jumping off rocks at the park or in the garden or on furniture in the home.
- Playing rough and tumble games giving increased body contact with the floor, and the other person.
- Fill up big toy trucks with heavy blocks, push with both hands to knock things down.
- Choose family activities that involve appropriate kinds of movement. Children often find doing something with the family more appealing than doing it alone and the whole family may discover new, healthy activities. Walking, swimming, hiking, horseback riding or playing tennis or cricket are only a few examples of enjoyable family activities.

These children can also benefit from weighted products; jackets, blankets, lap pads. Try using a weighted backpack and/or blanket or teddy filled with dried beans to see how they respond before purchasing

If you would like this factsheet in another language or format, for example Braille, large print or audio, please call:

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