

Sensory Processing

Participant Notes

Introduction

“I pulled away when people tried to hug me, because being touched sent an overwhelming tidal wave of stimulation through my body. I wanted to feel the comforting feeling of being held, but then when somebody held me, the effect on my nervous system was overwhelming... Small itches and scratches that most people ignored were torture. A scratchy petticoat was like sand paper rubbing my skin raw. Hair washing was also awful. When mother scrubbed my hair, my scalp hurt. I also had problems with adapting to new types of clothes. It took several days for me to stop feeling a new type of clothing on my body; whereas a normal person adapts to the change from pants to a dress in five minutes. New underwear causes great discomfort, and I have to wash it before I can wear it... I also liked long pants, because I disliked the feeling of my legs touching each other.”

Temple Grandin (2000)

People with autism often experience differences in the way they process sensory information which influences their behaviour, stress levels and ability to learn and socialise in particular environments. Although sensory processing issues are not currently included in the diagnostic criteria for the autism spectrum disorders, the presence of differences in sensory processing have been documented from as early as 1943. Both Asperger and Kanner described unusual sensory responses from the children they observed. Recent studies suggest that between 69% and 95% of children with ASDs have some kind of sensory processing deficit (Baranek, David, Poe, Stone & Watson 2006; Tomchek and Dunn 2007). These studies along with the personal accounts suggest that people with autism often have difficulties processing, interpreting and responding appropriately to sensory information. Understanding a child’s unique sensory profile and determining how it impacts on the child in all environments is critical in supporting success at home, school and in the community.

What is sensory processing?

Sensory processing is the way the brain receives, integrates and regulates the information received from all seven senses, to produce a response. In order to understand the environment around us and to feel safe, connected and able to learn we need to be able to process information from all the senses simultaneously. The brain (and nervous system) has the ability to turn up or turn down sensory information in order to focus on what is relevant in that environment. It is something that most of us take for granted.



The senses are defined as:

Proprioception

Often called our ‘internal eyes’, proprioception provides us with information about where our body is, how it is connected and what it is doing. This information comes from all the muscles and the joints, giving us information about the position of our body, how we are moving and where we are moving in the space around us. This sense provides us with a body schema which allows for accurate motor planning (the ‘blue print’ for movement).

Vestibular

This sensory system supplies us with information about balance and about how fast or slow our body is moving or responding to movement. Vestibular information comes from the inner ear, specifically the semi-circular canals, which are stimulated when a person moves their head. The vestibular system is sometimes called the ‘unifying system’ because it provides the foundation for the effective processing of the other senses. Together, proprioception and vestibular processing are known as the movement senses, and both are important for motor planning.

Touch

Also called the tactile system, this information comes from skin, and the inside of the mouth. There are also some touch receptors on other areas inside the body and the rectum. Touch receptors are not evenly spaced over the skin and some areas such as the finger tips, soles of the feet, lips and genitals provide more touch information than other parts of the body. Pain and temperature are also carried by this system and registration of these is important in protecting us from harm.

Hearing

Also called the auditory system, this sense involves the ear and allows for accurate interpretation of speech and environmental sounds. It helps us determine the pitch and volume of a sound and to locate the source of the sound.

Vision

This sense enables us to make sense of what is seen. The eye, or more specifically the retina of the eye, is stimulated by light and provides information about objects, people, distance and helps us determine our position in space. It is used to confirm all other sensory input.

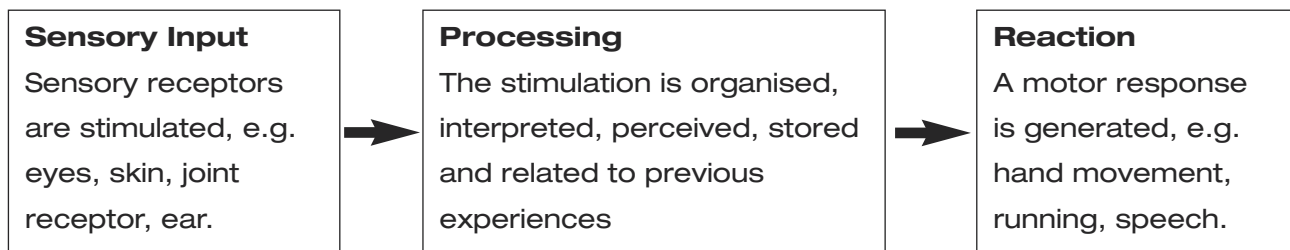
Taste

Also referred to as the gustatory sense, this information is received via the tongue. It provides information about different types of taste (including sweet, sour, bitter, spicy and salty), is closely associated with smell and helps us in determining whether an item is safe to eat.

Smell

Also called the olfactory sense, smell is the information received via the chemical receptors in the nose. It is closely related to taste and helps alert us to smells that could be dangerous. Smells are often closely linked to experiences either negative or positive.

Normal sensory processing involves:



From Learning through the Senses Resource Manual, 2001

It is important to remember that effective sensory processing forms the basis of understanding the world we live in. Processing and understanding the sensory world impacts on the development of cognition, language, motor skills, self care skills, as well as social and emotional development (Kashman and Mora 2005).

Characteristics of Sensory Processing Differences in Children with ASDs

What differences do children with ASDs experience with sensory processing?

The current research literature indicates that the majority of individuals with ASDs have issues with sensory processing and that some commonalities in the sensory profiles of children with ASDs are beginning to emerge (Ben-Sasson, Fluss, Cermak, Engel-Yeger & Gal 2009; Lane, Young, Baker, & Angley 2010). Despite this, it is clear that the sensory profile of each child with an ASD is unique (as is the case for us all). For some their sensory issues are highly significant and for others they may have little or no impact on their day to day life.

The following is one way of thinking about the sensory processing issues that children with ASDs experience. Common differences include:

Sensitivity (Over and Under Sensitivity):

Irregularities in registration of sensory information can occur in any of the seven senses, or in any combination of the seven senses resulting in unusual sensitivity to the surroundings.

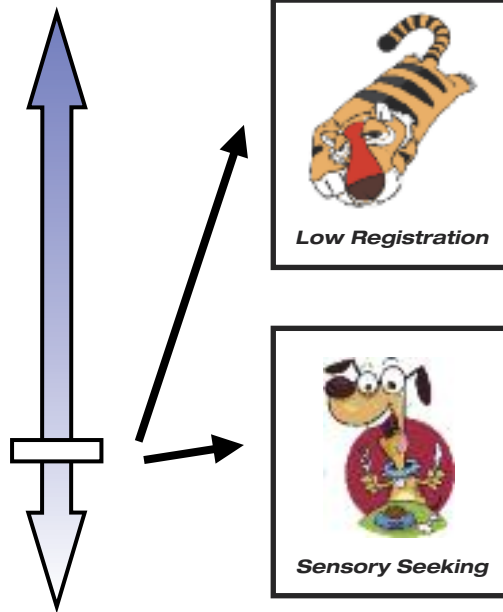
It can be useful to visualise each of a child's senses (and even our own) as a volume control or graphic equalizer which allows for a varying degree of sensitivity on a continuum from hypo- or under-sensitive to hyper- or over-sensitive. Each sense has its own volume control which dictates the relative sensitivity to information received through that sense. We all know people who are over- sensitive (think people who are bothered by tags in clothes, comment about the smell of things or are obsessively tidy) and those that are under-sensitive (think people who are clumsy, have high pain thresholds or those that are constantly moving and fiddling). These neurotypical people represent the continuum of sensory sensitivity and are able to employ a range of strategies to cope with things they dislike or to self-regulate.

A child with an ASD may demonstrate hypo- or hyper-sensitivity to a greater degree or their ability to compensate for these sensory processing differences may be limited due to the impact of the other characteristics of autism (consider the matrix).

A child may be hyposensitive (under-sensitive) to sensory information and may require much more sensory information for registration and processing (i.e. dampened/turned down sense). Some examples of how a child may repond to having turned down senses are included in the diagram on the following page.

When a child is under-sensitive to sensory information, it takes a lot of extra information for the child to detect the sensory input.

Hyposensitive /
Under-sensitive /
Turned Down/
Dampened

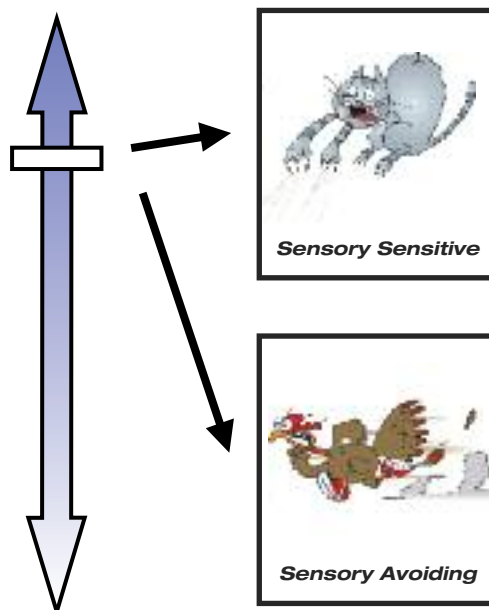


- may not register things that others notice.
- may need extra input to notice sensory input.
- may under-react to stimuli and end up in dangerous situations.

- may actively seek extra sensory input from that sense.
- may crave input from their senses that others would find nauseating or overwhelming.

Alternatively, a child may be hypersensitive (over-sensitive) to sensory information and may get more information than is required for registration and processing and he/she may not be able to screen out irrelevant information (i.e. heightened/turned up sense). As a result of this, the child may respond in an unusual way to sensory information. Some examples of how a child may respond to having turned up senses are included on the diagram below.

Hypersensitive /
Over-sensitive /
Turned Up /
Heightened



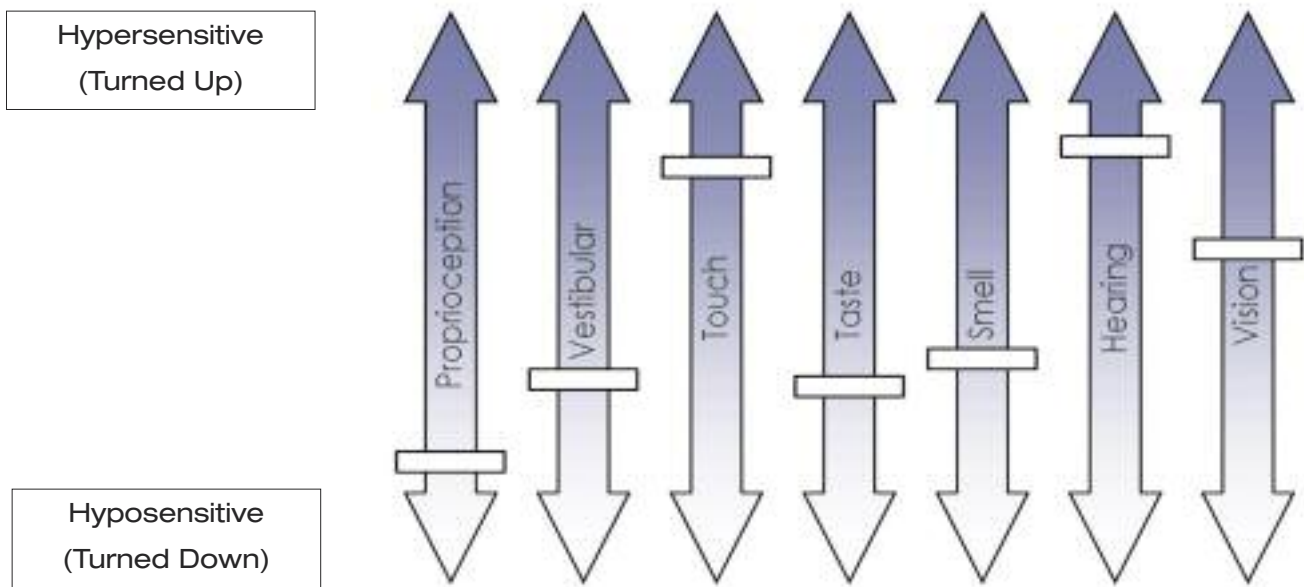
When a child is over-sensitive to sensory information, it takes very little stimulation to detect sensory input and the child registers sensation too intensely.

- may notice things others don't.
- may be bothered by things others aren't.
- may have a dramatic reaction to a low level sensory input.

- may avoid particular sensory information or situations where it is usually present.
- may create other sensory input to block out or mask the sensory input that is too intense.

Children with autism are likely to have a unique mix of heightened and dampened senses. Sensitivity may vary from day to day and sense to sense making the processing of consistent reliable sensory messages more difficult. It seems that for many children with ASDs, the degree of sensitivity (i.e. whether a sense is turned up or turned down) varies from moment to moment and fluctuates considerably depending on the child's level of stress.

Below is a diagram that illustrates one child's sensory profile:




The sensory profile of a child can make it more difficult to maintain the optimum level of alertness in order to attend to what is relevant and to stay focused. It may also impact on what the child is paying attention to in a particular environment or situation, and therefore what they are learning or how they are storing information. As such, children with ASDs often require much more energy and effort to cope in sensory environments and activities that others deal with easily.

Sensory Overload and Sensory Shut Down:

Sensory overload happens when there is too much information coming in at once and this is overwhelming for the person. It can be exacerbated by difficulties filtering out irrelevant sensory information. When experiencing sensory overload a person may find it even more difficult than usual to filter out irrelevant sensory information (like the feel of their underwear or a ticking clock in the classroom). Children prone to sensory overload often learn to control their environment or avoid overwhelming situations. Other individuals require adult support to know what causes them to overload and prevent situations from happening and to help them to manage it when it occurs.

When overloaded, a child may withdraw or use a behaviour that results in them being removed from the problematic environment. The child may also engage in a repetitive or ritualistic



behaviour that helps to screen out some of the source of the overload and provide consistent and reliable sensory information that is calming (e.g. flapping). It is also possible for a child to go into sensory shut down where they block out sensory information coming from one or more of the senses.

Link between sensory processing and stress:

It is vital to recognise the link between sensory processing and stress. Hypersensitivity to sensory information can result in children becoming highly aroused and overstimulated by their senses and these children can become highly stressed in the presence of such stimuli. The reverse effect is also true. In times of stress, the nervous system is already stimulated so a person can become even more sensitive to information through their senses, which can add further to their stress levels. We have all at some time, experienced extreme irritation at a tap dripping, a dog barking or a door slamming when we are stressed. This is because our system is already on alert and our senses are heightened. Hyposensitivity to sensory information can also contribute to stress. For example, children who are hyposensitive to sound may become stressed as a result of the fact that they fail to hear vital information or because they have missed the subtler sensory information that provides warning of an intense stimuli (e.g. child doesn't hear the teacher approaching and calling their name until the teacher is standing right next to them).

It is incredibly valuable to spend time observing your child's behaviour and their responses to sensory information in order to understand how his/her sensory system works. An occupational therapist can assist you in identifying your child's sensory profile and strategies that may assist.

Impact of Sensory Processing Differences in Children with ASDs

Obviously, the impact of sensory processing differences will vary from child to child and can be both positive and negative. Determining the impact of a heightened/dampened sense as well as other aspects of sensory processing is important for identifying if that area is a priority for management strategies and support.

The environment plays a critical role on the impact of sensory issues. A child's issues with heightened hearing may have little or no impact at home if he is an only child, his parents are quiet and he lives on a farm miles from neighbours. On the other hand, this same sensitivity may make school, especially events such as assembly and sports carnivals, highly stressful and a trip to the local shopping centre, a nightmare.

On the following page are some of the impacts of hypo- and hyper-sensitivity on the interests, preferences and behaviours of children. It is important to remember that some of the behaviours mentioned are appropriate at certain times for all people (e.g. limited food range in young children, fidgeting while listening to a presentation to stay alert).

Sense	Impact of Heightened/Turned Up/Hypersensitivity	Impact of Dampened/Turned Down/Hyposensitivity
Proprioception	<ul style="list-style-type: none"> • Moves stiffly • Appears clumsy • Bumps into things • Complains of aches and pains • Unusual body positioning 	<ul style="list-style-type: none"> • Seeks deep pressure • Loves ‘roughhousing’ • Likes to crash, stomp, bear hug etc • Tends to move around a lot • May walk on toes • May chew/suck things • May fidget a lot • May prefer tight clothing • Sleeping issues • Toileting problems (i.e. lack of awareness of need to go) • May appear to be rough or aggressive • Over-filling mouth while eating • Drooling excessively
Vestibular	<ul style="list-style-type: none"> • Appears fearful of movement • Fearful of heights • Afraid of falling • Dislikes being tipped upside down • Dislikes playground equipment and showground rides • Difficulty walking on uneven surfaces • Feels seasick/motion sick from movement 	<ul style="list-style-type: none"> • Thrill seeker • Difficulty sitting still • Constantly moving • Never gets dizzy • May love to spin and swing • Difficulties with spatial and motor planning particularly when movements are slow and controlled
Touch	<ul style="list-style-type: none"> • Avoids certain textures and surfaces • Dislikes being touched • Dislikes having dirty hands and feet • Overreacts to temperature and pain • Discomfort with clothing/tags/shoes • Resists cuddles • Dislikes messy play • Dislikes some hygiene routines and haircuts • May avoid certain food textures/temperatures 	<ul style="list-style-type: none"> • Tries to touch everything • Seems to be constantly touching • Unaware of pain and temperature • May smear faeces • May mouth objects • May touch genitals • May seek rough play • May bite his/her own skin • Doesn't realise hands/face are dirty • Fails to notice nasal discharge and saliva/food around mouth and nose

Sense	Impact of Heightened/Turned Up/Hypersensitivity	Impact of Dampened/Turned Down/Hyposensitivity
Hearing	<ul style="list-style-type: none"> • May become distressed by loud noises • Super-hearing – unable to filter out sounds • Covers ears to loud sounds • Avoids noisy places • May avoid or be fearful of toilets, hand-dryers, vacuum cleaners etc. • Distracted by noises • Complains about noises that others don't notice/aren't bothered by • May make own noises like hum or croon to block out external noises 	<ul style="list-style-type: none"> • May appear to ignore the voices of others • May make a lot of noise • May love loud places and loud music • Talks louder than other people • May appear not to know where the sound is coming from
Smell	<ul style="list-style-type: none"> • May comment on the smell of things • Says other people smell • Breathes through mouth instead of nose • May avoid certain environments (e.g. toilets, fish and chip shops) • Nauseated by cooking, bathroom smells or perfumes • Chooses food based on smell • Notices smells not noticed by others 	<ul style="list-style-type: none"> • May smell everything • Doesn't mind smell of their own bowel movements/dirty pants • Doesn't notice noxious odours or other smells • Not aware of own body odour/breath • Not alert to smell of smoke
Taste	<ul style="list-style-type: none"> • Gags or vomits easily • Picky eater or an extremely limited diet • Difficulties with sucking, chewing and swallowing • Dislikes toothpaste and may be overly fearful of dentist • May cover food in a preferred/familiar food (e.g. sauce) 	<ul style="list-style-type: none"> • May eat everything including non-food objects • May prefer strong tasting foods like chilli, garlic, spices, lemon etc • May chew on clothing, toys, pens etc • May mix unusual foods together (e.g. icecream with tomato sauce) • May regurgitate in order to get more information about the food

Sense	Impact of Heightened/Turned Up/Hypersensitivity	Impact of Dampened/Turned Down/Hyposensitivity
Vision	<ul style="list-style-type: none"> • May be sensitive to light • May be unable to block out unnecessary visual information • Demands to wear sunglasses or a hat even indoors • Likes rooms/spaces to be visually organised • Avoids eye contact • Turns away from a speaker/difficulty looking and listening at the same time • May become over-aroused in busy environments • May flap to screen out excessive vision • Trouble locating things in a busy environment • May look down to block out visual input 	<ul style="list-style-type: none"> • May stare/needs a lot of time to look and take in information • May look at objects for a long time • May lose their place while they are reading • Difficulty copying from the blackboard • Difficulty with fast moving stimuli • May bump into people and things • Intense interest in light, shiny or spinning objects • May flap, squint or spin to get extra reliable visual input • May touch objects to get extra information to compensate for difficulties processing visually.


Motor planning

Motor output is dependent on sensory input because sensory input is used to activate and/or inhibit motor responses (Huss, 1983). As a result, children with sensory processing difficulties may have problems with complex motor movements like feeding themselves, playing sport, handwriting or even talking.. It is important that difficulties with motor planning may also occur for reasons other than sensory and further investigation may be required.

Behaviour

The issues described above can mean that a child may use a behaviour to get particular sensory input or to avoid/get away from sensory input. Some children with ASDs may also use repetitive or stereotyped behaviours as their way to control their sensory environment and create consistent, reliable sensory input. Because of their social challenges, children with ASDs may not realise that certain sensory driven behaviours are considered annoying or inappropriate by others. It is important to identify what sensory need the behaviour is communicating in order to meet the need in a socially appropriate way.

NB: It is important not to make assumptions about the function (or purpose) of the behaviour. Not all behaviours that look sensory in nature will be achieving a sensory function – to get or get



away from sensory input are only two possible options for the function of a behaviour. It is only when we “meet the need, do we address the behaviour”. To explore this concept further it may be useful to look at the notes from the “Understanding Behaviour” Session or the Positive Behaviour Support online learning module and information session.

Stress

There are many factors that contribute to the stress levels of children with ASDs. These include but are not limited to issues with sensory processing. As discussed above, children with ASDs who receive unreliable or overwhelming information from their sensory systems can be highly stressed. When their sensory systems are running on high, they will find it more difficult to complete tasks and to make the same choices about behaviours that they can make when they are calm.

Daily living skills

Many of the activities of daily living (such as eating, sleeping, toileting, bathing, hair brushing, teeth brushing) are experiences that involve multi-sensory processing and can be difficult for children with ASDs depending on their sensory profile (e.g. a child who is hypersensitive to touch is likely to dislike showers, having their scalp touched and the feeling of a toothbrush in their mouth; a child who is hypersensitive to smell may dislike toothpaste, soaps, deodorant, hairdressing salons, public toilets etc). While difficulties with these daily living skills could be related to other aspects of the task (such as the degree of independence expected, number and complexity of steps, language demands, desire for routine, past experiences etc), it can be helpful to reflect on the sensory requirements of that task and compare it with the child’s sensory profile. This is particularly important if they are highly reactive or hesitant about the activity.

School participation and success

The sensory processing issues faced by many children with ASDs make many aspects of school life difficult. The school day is filled with activities and experiences that require efficient processing of information from the senses (e.g. constantly changing routines, group learning activities, noisy/busy visual environment, multitasking activities). Many children with ASDs will withdraw from or become overloaded by the learning activities and social situations due to their sensory sensitivities. For some children the sensory environment can have a cumulative effect on them over the course of the school day - often resulting in afternoon or afterschool ‘meltdowns’. Some sensory seeking behaviours can lead to problems establishing and maintaining social relationships (e.g. a child who smells classmates’ hair or rubs the stockings of his teacher may have difficulties with his peers).

Family Life

The sensory needs and preferences of a child with an ASD can have a significant impact on the home and social life of their family. Some families avoid situations at home (e.g. vacuuming, eating certain foods, playing certain music) and in the community (e.g. using public toilets, going to the show) that involve sensory situations that may be overwhelming to the child. The sensory behaviours of a child may also mean that families avoid having visitors to the home (e.g. if the child has a tendency to run around house naked or comments about the smell of others). Some families also have to deal with the stress that results from a “sensory overloaded” day at school and need to curtail family extracurricular activities in order to provide downtime and an environment with reduced expectations in the afternoon and evening.

Strategies

It is important to begin this section by acknowledging that sensory processing differences only need to be addressed if they are having a negative impact on the child, resulting in challenging behaviour or restricting the child’s ability to participate in activities at home, school or in the community. Addressing sensory issues in these instances involves having a clear picture of the child’s sensory profile and an understanding of the impact of the sensory environment/activity/routine on his/her ability to participate. By looking at these two aspects, one can identify any mismatch and consider how to minimise the impact of the child’s sensory profile on their ability to cope at home, school and in the community. When there is a mismatch between the child’s sensory profile and the environment or task, it is then possible to adjust the environment/task and/or teach the child how to cope more effectively with that situation or activity or to access their sensory needs in another, more appropriate way.

Understanding and communicating the child’s sensory preferences

There is no ‘one size fits all’ approach to supporting sensory processing, thus “learning how each autistic person’s senses function is one crucial key to understanding that person” (O’Neil, 1999). Having an awareness of the impact of sensory processing issues on a child can assist all people living and working with the child to understand why he/she behaves in a particular way and what barriers exist to participation. An occupational therapist can be helpful in providing tools for identifying and recording your child’s sensory profile, but you can also document your child’s sensory needs and preferences on the matrix.

Sharing information with your child’s teacher and others who work with him/her is incredibly important as understanding his/her sensory needs and preferences will help your child’s teacher to understand his/her behaviour, to keep him/her calm, to engage him/her in learning and to motivate him/her to complete tasks.

Modifying and adjusting the environment

Many inappropriate behaviours including those that have a sensory basis can be minimised or avoided by modifying or adjusting the environment. This process involves considering the sensory environment (e.g. noise in the room, amount of visual distractions) or the sensory demands of a task/activity (e.g. odour of the equipment, movement requirements of the task) with the child's sensory needs and preferences in mind.


There is no such thing as an ideal environment for a child with an ASD as every child's sensory needs and preferences will differ. Adapting the environment or task may include:


- Providing an alternative activity
- Using timers and timetables to explain the duration of non-preferred activities
- Providing advance warning about sensory experiences that are known to bother the child so that coping strategies can be put in place
- Providing opportunities for developmentally appropriate sensory experiences within the context of functional age-appropriate activities (Baranek, 2002)
- Providing breaks in the timetable to access preferred sensory activities
- Organising a child's timetable or daily routine so that activities that contain overwhelming sensory input are interspersed with calming activities/sensory input
- Providing a quiet place in the room to go and calm their sensory systems

Appropriately structuring a child's timetable and adjusting the sensory environment to accommodate a child's unique sensory processing patterns can:

- Reduce exposure to sensory input that would usually be too overwhelming
- Reduce the stress associated with some tasks/environments
- Provide opportunities to access sensory input in a controlled way that maintains an appropriate level of arousal
- Provide access to sensory stimuli in a socially appropriate way
- Provide time to calm between exposure to sensory input
- Provide opportunity for the child to prepare himself/herself for unpleasant sensory situations

Some specific ideas for adjusting the environment based on the child's pattern of over- and under-sensitivity are provided in the table below. These are ideas only as it is important to consider the nature and impact of each child's sensory profile and tailor strategies to suit. It is only necessary to implement strategies in areas where over- or under-sensitivity is having a negative impact on a child's ability to participate.

	Proprioception	Vestibular	Touch	Taste	Smell	Hearing	Vision
Hypersensitive Turned Up Over-sensitive Heightened 	Provide slow rocking movement to reduce muscle tension Allow child to use heat packs to reduce muscle fatigue Allow breaks from movement activities	Never force on playground equipment but provide encouragement Avoid elevators and lifts Encourage child to use handrails when climbing stairs Give way to communicate when feeling "sick" Allow child to sit in preferred seat in bus, car etc Allow child to watch movement activities first	Seat child away from thoroughfares to avoid accidental touch Give advanced notice of touch When touch is necessary, be firm Allow child to wear gloves Allow child to choose clothing Relax uniform requirements Slowly introduce new tactile experiences Cool or heat the room Allow child to sit on chair instead of floor Celebrate "being messy" Use "finger sock" rather than a toothbrush for brushing	Allow child to have preferred food at meal times Provide "safe" foods on excursions, birthday parties etc. Slowly introduce new foods Don't disguise foods or hide medication in preferred foods Introduce foods that are similar to foods that the child already eats Allow child to choose toothpaste Allow child to eat away from others	Introduce new foods and smells when the child is calm Encourage child to mouth breathe Use preferred cleaning product on child's desk Allow child to choose soaps, detergent, deodorant etc. Avoid perfume Try foods at room temperature or cold with the odour is less obvious Allow child to eat away from others Allow child to use staff toilets	Reduce extraneous noise Provide a quiet place for the child to work or play Prepare the child before entering loud environments Give warning of loud noise Teach child to hum to block out noise Allow the child to wear earplugs or headphones	Reduce visual clutter in the classroom or the child's bedroom Present material in a visually organised way Provide visually "quiet" place for child to work Modify lighting Allow the child to wear sunglasses or a hat

	Proprioception	Vestibular	Touch	Taste	Smell	Hearing	Vision
<p>Hyposensitive Turned down Under-sensitive Dampened</p> 	<p>Provide opportunities for heavy work (like carrying books or shopping, moving furniture) Provide movement breaks between activities Provide fidget toys in pockets or on desk Allow child to sit on chair instead of floor Allow child to lean when sitting Use weighted products to give more awareness of body position (it is important to consult an OT about the use of weighted products) Allow child to wear tight clothing Seat on fit-balls, move 'n' sit cushion or other seat that provides movement</p>	<p>Provide supervision on equipment Provide opportunities to seek movement safely Provide movement breaks between activities Provide access to swing Give access to movement when seated</p>	<p>Provide fidget toys or other textured items in pockets or on desk Provide structured touch experiences to develop a library of knowledge about how things feel Provide rules, clear visuals and mirrors to assist with hygiene routines Remind and reward about appropriate touching of others</p>	<p>Put non-food items out of reach Allow access to food regularly Have snack times before work/play with items that can be mouthed Give high flavour foods (e.g. garlic, spices, lemon juice etc)</p>	<p>Introduce strong smelling food Use smelly textas, pencils, erasers etc Provide opportunities for smelling during day Provide smelling box that contains things the child is allowed to smell</p>	<p>Allow time for noisy play Get child's attention before talking Use other senses to get child's attention (e.g. stand in one place to give directions) Use visual supports to support listening Allow the child to listen to music in class to reduce need to make other noise that irritates others Put volume limit on ipod</p>	<p>Use high contrast on work sheets Give bright visual toys Allow time to play with visual toys, games etc Give the student extra time to take on visual information Leave the visual information displayed for longer</p>

Improving ability to communicate sensory needs/issues

Many children with ASDs have difficulty attributing feelings they are experiencing in their bodies or heightened levels of stress to the sensory stimuli present in the environment. Some children even struggle to realise that they are stressed/agitated/aroused and need to be taught to read their own signs of stress/overload even before they can communicate these feelings to others. Some children benefit from being taught to use an “I’m stressed” or “I need a break” card to ask for a break from an overwhelming sensory environment. It can also, over time, prove useful to assist (perhaps with the aid of a visual support) to identify what it is about a sensory environment that is causing them distress and to assist them to decide what to do about it.

Improving self-awareness and self-regulation

Sensory issues affect a child’s ability to attain, maintain and change arousal levels appropriate for the task or situation (Murray-Slutsky and Paris, 2005). It is, therefore, often a focus of parents and teachers to support a child to identify the impact of sensory input on their arousal level and to teach them to use sensory and other strategies to change their arousal level in order to complete a task or activity.

The following approaches may be implemented by or on the direction of an occupational therapist. While there is limited research in the form of direct evaluation of the effectiveness of these interventions, they attempt to address the underlying characteristics of autism and draw on other approaches with emerging evidence bases. It is important to consider the risk management approach to decision making when determining if these approaches are appropriate for your child (see Session Three and Session Three Support Materials).

Sensory Stories:

Similar to Social Stories™, a sensory story attempts to reduce anxiety about a situation by providing the child with accurate information about what to expect in a situation. A sensory story can provide information about what a particular experience looks, smells, tastes, sounds and feels like and gives advice about how unpleasant sensory stimuli might be dealt with. The power of a sensory story appears to be in providing the child with an ASD with advance warning of what to expect and when it will be finished, which seems to make dealing with unpleasant sensory experiences easier to handle.

Sensory Diet:

“Occupational Therapists (OTs) use the term sensory diet to describe a personalized schedule of sensory activities that give your child the sensory fuel his body needs to get into this organized state and stay there” (Biel & Peske, 2009, p. 106). The sensory activities are chosen to match the child’s sensory profile and are used intermittently to help a child maintain a “just right” state of arousal to enable him/her to focus and for emotional wellbeing. While there is

little empirical evidence to support this approach, many occupational therapists will promote the use of regular opportunities to access sensory input to regulate the sensory systems within naturally occurring and functional opportunities in a child's day.

Alert Program for Self Regulation:

The Alert Program for Self Regulation (Williams & Shellenberger, 1996), is another program with limited empirical support that is commonly used with children with ASDs to teach them to identify and manage, through the use of sensory tools, their own level of arousal. The program draws from cognitive behavioural therapy which has a strong evidence base for supporting anxiety and anger in children with Asperger Syndrome. The program likens the body to an engine and teaches the child to identify their engine speed and to use appropriate sensory tools to speed up or slow down their engine appropriate to the situation.

Desensitisation

In cases where a child's response to sensory stimuli is extreme and the sensory stimuli or situation cannot be avoided permanently or it is not in the child's best interest to avoid this situation/stimuli, desensitisation may be necessary. Desensitisation involves graded exposure to increasing proximity, intensity or amount of a feared stimuli or situation supported by people or objects that calm the child. It is critical this happens very slowly and the exposure is so gradual that the child is never placed in an overwhelming situation and that the situation remains positive. This process is usually paired with modelling whereby the child observes others responding in a non-fearful way to a situation that causes the child with an ASD high levels of stress. The child's obsessions or other highly motivating items and activities are often used to reinforce a child who accepts increasing exposure to the sensory experience.

Before concluding, it is important to clarify the difference between Sensory Integration Therapy and the adjustments and strategies discussed above that are designed to minimise the negative impact of sensory processing irregularities.

Sensory Integration Therapy (SI) claims to improve the sensory processing capabilities of the brain through the provision of vestibular, tactile and/or proprioceptive stimulation. The proponents of SI posit that focused sensory stimulation provides long term changes to the brain that improve behaviour and skills.

Current research does not support SI theory or SI Therapy as an effective intervention for children with autism.

Summary

For children with autism the sensory world is a confusing place. No one sense exists or impacts on its own, and it is the interaction of the seven senses and the environment we need to consider when supporting children on the autism spectrum. “When people understand their own and their children’s sensory processing patterns, then they can create life routines that are consistent with sensory processing patterns and thereby support successful participation” (Dunn, 2007).

Useful resources and references

Books

Biel, L. & Peske, N. (2009). *Raising a Sensory Smart Child: The definitive handbook for helping your child with sensory integration issues*. London: Penguin Books.

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Tomchek, S. D., & Dunn, W. (2007). Sensory processing in children with and without autism: A comparative study using the Short Sensory Profile. *American Journal of Occupational Therapy*, 61, 190-200.

Websites

Sensory Issues in Autism from East Sussex Council

<http://www.eastsussex.gov.uk/NR/rdonlyres/6A681CDE-35E2-4993-977D-9AC52ACA4D88/0/sensoryissuesinautism.pdf>

National Autistic Society

<http://www.nas.org.uk/nas/jsp/polopoly.jsp?d=2427&a=3766>

Sensory Shop

<http://www.sensoryshop.com/>

Sensory Processing Disorder Website

<http://www.sensory-processing-disorder.com/>

GROWTH MODEL

My son, Thomas, likes to touch the hair of his classmates while he is sitting in class. He sometimes will approach ladies with long hair and attempt to stroke it. This can be very embarrassing when we are out and as he is getting bigger people are thinking it is not as cute as they used to. When there is no hair around, he will rub and touch anything he can get his hands on. We don't go out much because of this. What can I do to stop this so we can go out more as a family and so he stops annoying his classmates?

G	For Thomas to stop touching hair in class and the shops.
R	When seated at his desk, Thomas will reach forward to play with the hair of the girl in front and when seated on the floor he will also play with anyone's hair who is nearby. He also will approach people in the playground and when we are out, to touch their hair. When there is no access to hair, he will touch other things including rubbing his hands along walls and smooth surfaces. We don't go out much because of this behaviour. Thomas doesn't understand that he is bothering other people. The family is embarrassed by his rubbing. The other kids at school get annoyed at him.
O	Give Thomas something else to do with his hands when we are out. Put some coloured hair samples in his pockets to play with. Seat Thomas at front of the room so he can't play with hair. Seat him away from the girls whose hair he likes to play with. Schedule time where he can do the girls hair or my hair at home. Get a hairdressing doll that he can play with in the quiet area of his classroom. Use a social story to explain to Thomas why others are bothered when he touches their hair. Teach Thomas using the circle concept whose hair it is okay to touch and when.
W	Teach Thomas when it's okay to play with hair and when he needs to use his pocket hair samples.
T	Get hair samples from the hairdresser. Sew tab in all his pants to hold the hair samples inside his pockets Use a photo/remnant timetable to explain when he can play with real hair.
H	Have spare hair samples ready at school and in handbag. Have a reminder card on door and spare samples on door to remind us to put in Thomas' pockets. Talk to school in collaborative planning meeting about use of timetable and hair samples.

GROWTH MODEL

My son, Andrew, is in high school. He has lots of difficulty with handwriting required to complete his schoolwork. He complains of getting dizzy when copying from the board. When he writes he pushes really hard and sometimes leaves holes in his page. It takes him a long time to write and he fatigues really easily. He tries to avoid classes that require lots of writing and often comes to class without his books or pencils. What can we do to help him complete his school work while minimising his stress/anxiety?

G	Andrew to complete his school work more effectively.
R	Andrew is under-sensitive to proprioceptive information and finds it hard to write. Andrew is over-sensitive to vestibular information so when he has difficulty moving his head up and down to copy from the board. He tries to avoid writing and classes that require writing. He fatigues easily when writing. He has difficulty keeping up with the other students with his school work.
O	Allow Andrew to use a keyboard for writing. Teachers provide paper version of the boardwork for Andrew to copy from. Weighted pens and weighted wrist pad to give more proprioceptive feedback while writing. Give breaks during writing tasks. Give Andrew a scribe during assessment tasks. Allow Andrew to photocopy classmates' notes. Allow Andrew to use speech to text computer program to complete written work. Allow Andrew to use a keyboard/laptop.
W	Talk with each of Andrew's teachers about which strategy will work in what situation.
T	Arrange a meeting with Andrew's teachers and occupational therapist to discuss writing issues and to agree on strategies. Purchase necessary adaptive equipment/technology. Document the strategies on the matrix, Andrew's Individual Education Plan and in his Relief Teacher Learner Profile.
H	Schedule meetings each term to meet with Andrew's teachers. Email correspondence fortnightly with teachers to see how strategies are working.

