



# Visual Supports & Beyond

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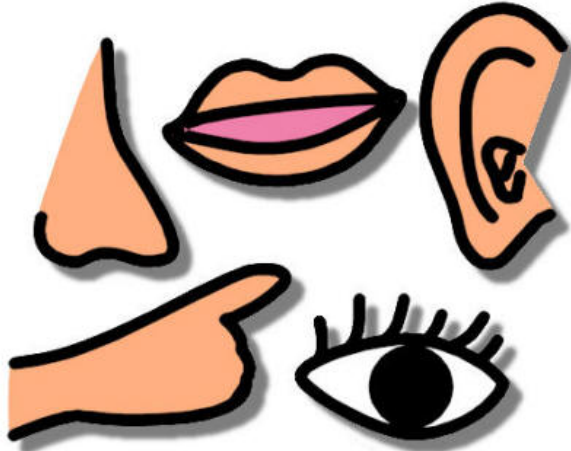
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Welcome to the world of **Sensory Integration**. It's something that's a huge issue for most people on the autistic spectrum, and yet many people responsible for supporting those same people know next to nothing about it. And once again, it's not that complicated once you understand the basic theory behind it.

Sensory integration (SI) and it's dysfunction was originally described by an Occupational Therapist called [Dr Anna Jean Ayres](#) in the 1960's, and it is OTs today who are the real experts in this area, although funding for them to work on SI with children with autism is not always easy to come by, something that may well reflect a lack of understanding of just how important this is.

In order for us to understand the problems it causes children and adults with autism, we need to understand how it works in us first. And once again, hopefully you'll see that the behaviours we see in children as a result of their SI issues aren't that surprising and that you yourself would do similar things in their position.

First of all, we need to name the senses. Did you know we have seven senses? Most people can only name five; smell, taste, hearing, touch and vision. When teaching on this subject, I ask people to list the seven senses before we start, and to have a guess at the ones they don't know. Some of the answers over the years have been very entertaining, we've had sense of humour, the ability to see ghosts (sorry Bruce Willis!) and common sense among others.

The sixth and seventh senses are vestibular (balance) and proprioception (body awareness), I'll explain more about this later when I go through the senses one by one. The graphic on the right has the 'science' names for the seven senses, hover your mouse over it to see the everyday terms.

Proper sensory integration is essential for learning. We can see this demonstrated in the Williams & Shellenberger Pyramid of Learning below. If you think of a pyramid, you can't build the higher up bits until you have the foundation stones in place. If you're familiar with [Maslow](#), you'll know how these things work.

As you can see, the seven senses are the foundation stones in this case. When these don't function properly, it has a knock on effect through the entire pyramid all the way to the top.

And what do we find at the top? Academic learning. You'll also see behaviour just below that, followed by attention - how many people query ADHD in a child with autism? You may well have thought this about your own child, have you investigated SI first?

Have a look at the various blocks of the pyramid, does your child have problems in one or more areas? If you're not sure what something means, Google it. To me, as an LD nurse working with children with autism, several jump out at me.

I've already mentioned learning, behaviour and attention, the ability to screen input is something I'll come back to later, hand-eye coordination and postural security (the ability to not fall off your chair!) also stand out.

If you want to know about daily living activities, look up the [Roper-Logan-Tierney model of nursing](#), its one of the few things I remember from

Vestibular  
Proprioception  
Olfactory  
Visual  
Auditory  
Tactile  
Gustatory

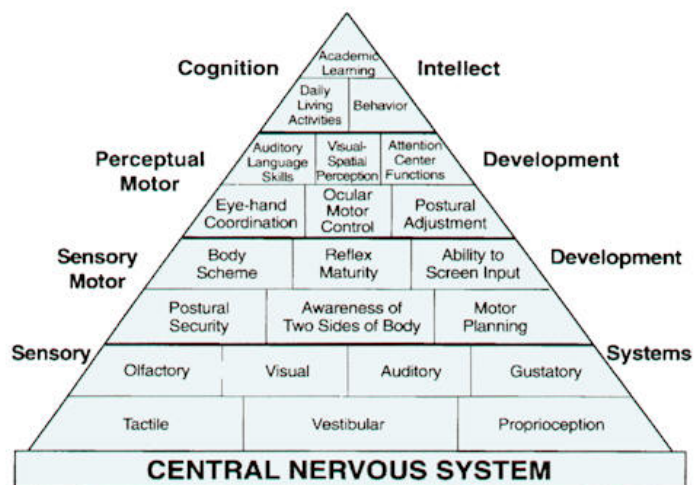


Figure 5. Pyramid of Learning. (Williams & Shellenberger, 1-4)

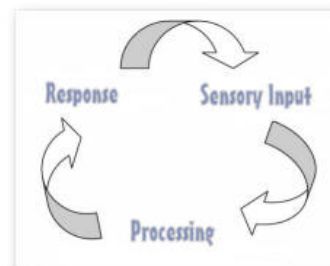
my university days!

So, that's the importance of the senses, but how does it all work? Let's follow a sensory input on its journey through our body and see what happens. Remember, most of the time this happens without us being aware of it.

First, the **sensory input**. A sense receptor is stimulated. It then sends this to the brain.

Next, we have **processing**. Sensory information is organised, interpreted, prioritised, stored and related to previous experiences.

Finally, we have the **response**. A response to the sensory input is generated. This could be a motor (behaviour?) response, and thought, or even an emotion (and we talked about how children with autism have trouble understanding emotion when we looked at the triad).



So, where does it go wrong? Usually with the processing, so let's look at that in a little more detail.

When we looked at learning styles, I talked about people with autism sometimes needing longer to process information. This goes for everything, including sensory information. So, if I have autism, and I put my hand on a hot cooker, my tactile sense sends an alert to my brain, which then takes say fifteen seconds to process the information...Ouch!

We also need to look at prioritising. When you're watching the TV, your brain automatically "tunes out" all irrelevant information, such as the fridge humming, clock ticking and so on, and allows you to focus on the sound and vision from the TV. This is the 'ability to screen input' in the pyramid I said I'd come back to. Your brain can filter out what you don't need. Now, say someone drops a saucepan in the kitchen, your brain suddenly switches your attention to that noise, so that you can consciously decide whether you need to respond. Now, although the TV is still on, the volume just as loud, for a short while you're not aware of it. Your brain has prioritised the saucepan over the TV.

We're back to ancestor Ugg twenty thousand years ago. This time he's sat round the fire, listening to someone telling a story. His 'filter' has tuned out the crackling of the fire, the sound of the crickets in the grass, the feel of his clothing on his skin. Suddenly, an unexpected noise in the night, it could be the lion! Instantly he's alert, ready for action, [fight or flight](#).

Many people with autism seem to lack this filter, so their brains can become overloaded with a deluge of sensory input. If you just pause to think about how much sensory information your brain is filtering out right now, its astounding. You have seven senses, all dealing with multiple inputs. The touch of your clothes on your skin, the chair under your bottom, your hand on the computer mouse or keyboard, your feet on the ground, and that's just tactile! How many sounds are there, smells, how much clutter is around your computer? Imagine if you couldn't just ignore it. Would you be able to concentrate to read these words?

You can try a little exercise to see what its like. Get family members to rub your arms or legs and chat as they do so, how well can you read these words with all that going on?

Going back to processing, let's also think about 'related to previous experiences'. When we looked at imagination in the triad, we learned this is something that some people with autism have difficulties with. If that's the case, then surely every input would be like that dropped saucepan, demanding your conscious attention, making you jump, triggering that 'fight or flight' response just in case.

OK, so that's how SI works in us, and already we've seen where some of the issues are for people with autism, and we haven't even got to the senses themselves dysfunctioning yet! Well, that's where we're going next.

We all need a certain level of sensory stimulation in order to feel 'normal', to feel grounded. That's why sensory deprivation affects us so much. When we don't get enough, we consciously or not seek it out. If you're in a classroom, listening to a teacher, without thinking about it you may chew your pen or fingernails, twiddle your hair or touch your face and lips (all tactile), or maybe you'll swing back on your chair, stimulating your vestibular sense (and maybe a bit of proprioception).

If you're at home, doing the ironing, you may pop the radio or TV on for a bit of background noise, or hum a little song to yourself. Too little stimulation and your brain is 'starved'.

Of course, too much stimulation and your brain becomes overloaded, if you have teenagers in the house you'll know what that's like! Three different stereos playing loudly, the TV blaring, loud voices talking excitedly, this is when you'll take yourself off for a bit of 'peace and quiet' or shout "turn that racket off, I can't hear myself think!", maybe along with an appropriate expletive.

There are other factors that affect our ability to cope with sensory stimulation too, like tiredness or illness. If you're well rested, you'll probably cope better with the noise children make than if you are tired.

So, basic equation, too little stimulation of a sense, we seek more out. Too much stimulation of a sense, we try to reduce the input.

Now, for people with autism, their senses can be **over sensitive** (hyper), or **under sensitive** (hypo).



- If a sense is over sensitive, their tolerance for sensory input through that particular sense will be greatly reduced. Normal sensory information will 'overload' them. They will try and reduce the input.
- If a sense is under sensitive, their brain will be 'starved' of sensory information, they will seek out stimulation of that sense. They have to do this, in order to 'feel normal'. The same as we do. But without the understanding of social rules that we have.

Now we'll have a look at the seven senses and some of the things we see children with autism doing in those areas when their senses are over or under sensitive. It is by looking at these things we can build up a picture of a child's sensory profile and how it affects their behaviour and learning. Not all people with autism have difficulties with all their senses, but most have some degree of sensory processing impairment.

## Vestibular

Situated in our inner ear, this is our sense of balance, of where we are and how we are moving (including speed) in relation to the pull of gravity. We need it to keep our balance and maintain our posture.

If our vestibular sense is **over sensitive**, we need to reduce and avoid the input. Things we see in children are;

- Difficulties with activities which involve movement, such as sport.
- Car sickness.
- Hating the head not being in an upright position.
- Difficulty with walking or crawling on uneven surfaces.

If the vestibular sense is **under sensitive**, then we need to seek out sensory input and stimulate it. We see;

- The need for rocking, spinning and swinging.
- Lots of running around and jumping.
- Happy to spend hours on a trampoline, bouncing on furniture etc.

## Proprioception

Our body awareness system, tells where the different parts of our body are and how they are moving in relation to each other. It is situated in our joints and muscles and tells us what parts of our body are doing even when we can't see them.

If our proprioceptive sense is **over sensitive** we need to reduce and avoid the input. We see;

- Difficulties with fine motor skills.
- Placing the body in strange positions (ones that reduce proprioceptive input).
- Maybe turning the whole body to look at things rather than just turning the head.

If it is **under sensitive**, we see;

- Low muscle tone.
- Weak grasp (may drop things).
- Stumbles or falls over a lot.
- May stand too close to people due to not understanding personal body space.
- May bump into people or objects.
- And again the strange body positions, this time ones that stimulate the proprioceptive sense.
- Enjoying trampolining, with lots of moving around and interesting postures.

## Olfactory

This is our sense of smell, it is processed through chemical receptors in the nose and gives us information about our immediate environment. Smell is a sense that is often neglected and forgotten about, but can be quite powerful. Have you ever had a smell trigger a memory that 'takes you back'? It's a quite a strange, emotionally charged feeling, which is fine when you understand emotions!

In the **over sensitive** group we often see;

- Smells being intensified and overpowering.
- Toileting problems (if you've ever taken a strong whiff of smelling salts, you know how painful a strong smell can be. Now imagine that every time you sat on the loo, you'd be reluctant to go too!).
- A dislike of individuals with distinctive perfumes, shampoos, and smokers.
- Wearing the same clothes all the time (we often can't smell ourselves, but fresh laundry can smell quite strong, depending on the detergents and conditioners used).
- Fleeing from smells and people.
- Sometimes even self-injurious behaviour (SIB) in response to smells, especially to the head and nose.

If its **under sensitive**, we may see;

- Seeking out or failure to notice strong odours.
- Smelling or licking self, other people or objects.
- Smearing of faeces, earing it or putting it up the nose.

## Visual

Our sense of sight is situated in the retina of the eye, and is activated by light. It helps us to define objects, people, colours, contrast and spatial boundaries.

People with **over sensitive** sight report;

- Distorted vision occurs and objects and bright lights can jump around.
- Fragmentation of images as a consequence of too many sources.
- Focusing on a particular details (such as sand grains) can be more pleasurable than looking at something as a whole.
- It is less overloading to simply look down at the floor all of the time.
- A fascination with stripes, patterns, wheels, spinning, twirling etc.
- Some sources of light, particularly fluorescent lighting, can appear to flash like a strobe light and be painful.

People with **under sensitive** sight say;

- They may see things darker than they really are, and lose features or lines.
- For some they may concentrate on peripheral vision because their central vision is blurred, while others say that a main object is magnified and things on the periphery become blurred.
- They may have poor depth perception, leading to problems with throwing and catching, and general clumsiness.
- Some are attracted to lights.
- They may look very intensely at people.
- Often we see children moving fingers or objects in front of their eyes, sometimes while looking at a bright light.
- They may be fascinated with reflections and brightly coloured objects.
- They could be afraid of heights and travelling at speed.
- Some report having difficulty with certain colours.

## Auditory

As with the vestibular sense, our hearing is situated in our inner ear. It informs us about sounds in our environment and is the most commonly recognised aspect of sensory impairment.

**Over sensitive** hearing can lead to;

- The volume of noise being magnified and surrounding sounds distorted and muddled.
- An inability to cut out certain sounds (like ticking clocks) leading to difficulties concentrating.
- Covering the ears a lot, especially in response to sudden noises.
- Sleep difficulties.
- A dislike of active, noisy animals such as dogs.
- Being scared of thunderstorms, crowds and haircuts.
- Needing to make repetitive or droning noises to drown out other sounds, or using 'white noise' such as a TV or radio tuned to static or a fan for the same reason.
- Attacking, hiding and breaking the sources of noises, such as telephones and bells.

If hearing is **under sensitive**, we may see;

- Not acknowledging some sounds.
- Enjoying noisy places such as kitchens or swimming pools.
- Tearing paper, crumpling it, throwing objects that break noisily.
- 'Homing in' on sources of noise, such as a washing machine starting its spin cycle,
- Making loud, rhythmic noises.

A hearing impairment can have a direct effect of communication and balance.

## Tactile

Our sense of touch is situated on our skin. It tells us about touch, pressure, pain levels and helps us to distinguish temperature. Touch is a significant component of social development.

People with an **over sensitive** sense of touch may;

- Resist being touched, as it may be painful.

- Dislike having anything on their hands or feet.
- Dislike the wind, showers, and hair brushing, washing, drying or cutting.
- Hate tight clothing, certain textures or types of clothing, or prefer to be naked.
- Avoid getting messy.
- Dislike certain textures of food, or food with more than one texture (like meat in sauce).
- Avoid people altogether, as they always insist on touching!
- Overreact to heat, cold and pain.

If it's **under sensitive**, they may;

- Love cuddles, maybe holding others too tightly for too long.
- Have a high pain and temperature threshold.
- Self-harm.
- Enjoy heavy objects on top of them.
- Like pressure, tight clothing.
- Mouth objects, biting them to gain sensation.
- Love the feeling of resistance you get from water.
- Enjoy and often initiate rough and tumble play.

## Gustatory

And finally we come to our sense of taste. It is processed through chemical receptors in the tongue, and allows us to detect sweet, sour, bitter, salty and spicy.

If it's **over sensitive**, we may find;

- Some flavours and foods becoming too strong and overpowering.
- Resistive eating.
- Using the tip of the tongue for tasting.
- Gagging or vomiting when presented with certain foods (can also be smell).
- Preferring bland foods.
- Hating fizzy drinks (can also be tactile).
- Hating chewing. The bit where the food is in the mouth is too aversive, so it goes in and straight down.

And in **under sensitive** we may see;

- A love of strong and spicy foods.
- Eating everything, soil, grass, faeces.
- Mouthing and licking objects and people.
- Loving mixed foods, such as sweet and sour.
- Regurgitating food and eating it again!