

# EYs SENCO Forum

## Sensory Integration

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16 November 2022



# What is Sensory Integration?

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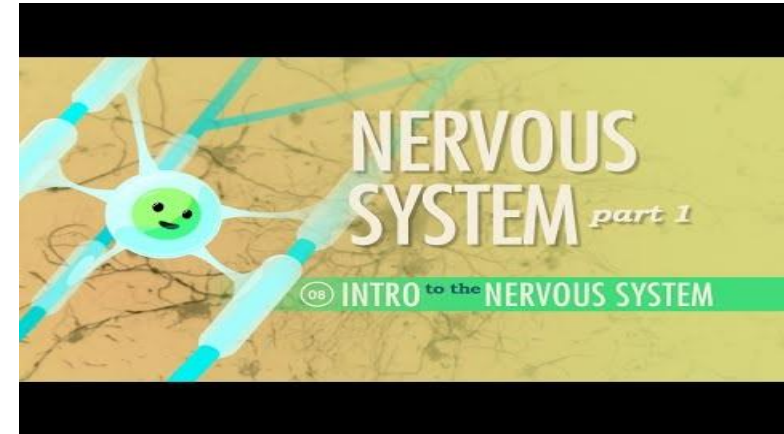
- Every person has multiple sensory systems
- Sensory systems involve your nervous system
- These systems identify, organise and respond to stimuli
- To do this effectively they recognise a stimulus, send a message to our brains which initiates a string of actions that either cause a response from our bodies or do not
- It's a developmental process
- It is different for everyone

# Neuroscience Whistle Stop Tour

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## Basic Facts:

- We have sensory neurons all over our body
- They pick up stimulus
- They send signals up the spine to the brain
- In the brain signals are exchanged to decide what to do
- Then signals are sent back down the chain via different nerves to respond if a response is needed



[https://www.youtube.com/watch?v=qPix\\_X-9t7E](https://www.youtube.com/watch?v=qPix_X-9t7E)

# Our Senses

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- Who can name all 8?

Proprioception

Vestibular

Tactile

Gustatory

Olfactory

Auditory

Visual

Interoception

# Visual

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- The process by which our eyes use light to signal to our brain and accurately interpret the world through vision

Responsible for:

- recognising objects, people and places
- Tracking
- Peripheral vision
- Spatial relationships
- Attention to detail
- And much more...

# Auditory

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- The process by receptors in our ears signal to the brain to recognise, respond to or tune out noise in the environment

Activity:

For two minutes remain silent and write down every noise you can hear

Share.



# Olfactory

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- The process by which receptors in our nose signal to the brain regarding the smell of people, places, objects etc...

Responsible for:

- Indicating if something is safe or not
- Closely linked to emotional regulation and memory
- Linked to taste

# Gustatory

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- Responsible for interpreting taste and flavour
- Broken down into : salty, sweet, bitter, sour and umami
- Tells us if something is safe to eat
- Also requires input from the tactile and olfactory systems



# Tactile

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- The process by which through our skin we interpret sensation

Responsible for:

- Recognising temperature, texture, pain and pressure
- It is the first sense to develop in utero
- Core component of attachment, safety and security

# Proprioception

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- The process by which sensors within our muscles and joints send feedback to the brain to tell us where our body is

Responsible for:

- Determining force and pressure
- Determining the position, orientation, location and movement of body parts
- Works in unison with the vestibular system much of the time

*Close your eyes and describe to a partner the position of each of your limbs*

# Vestibular

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- The process by which sensors in our inner ear register the speed and direction of our head movement

Responsible for:

- Balance and coordination (in conjunction with proprioception)
- Keeping us upright!
- Works closely with the visual system e.g. being able to track an object whilst moving

*Stand on one leg with your eyes shut, now with eyes open*

# Interoception

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- The process by which internal sensors register the internal state of the body

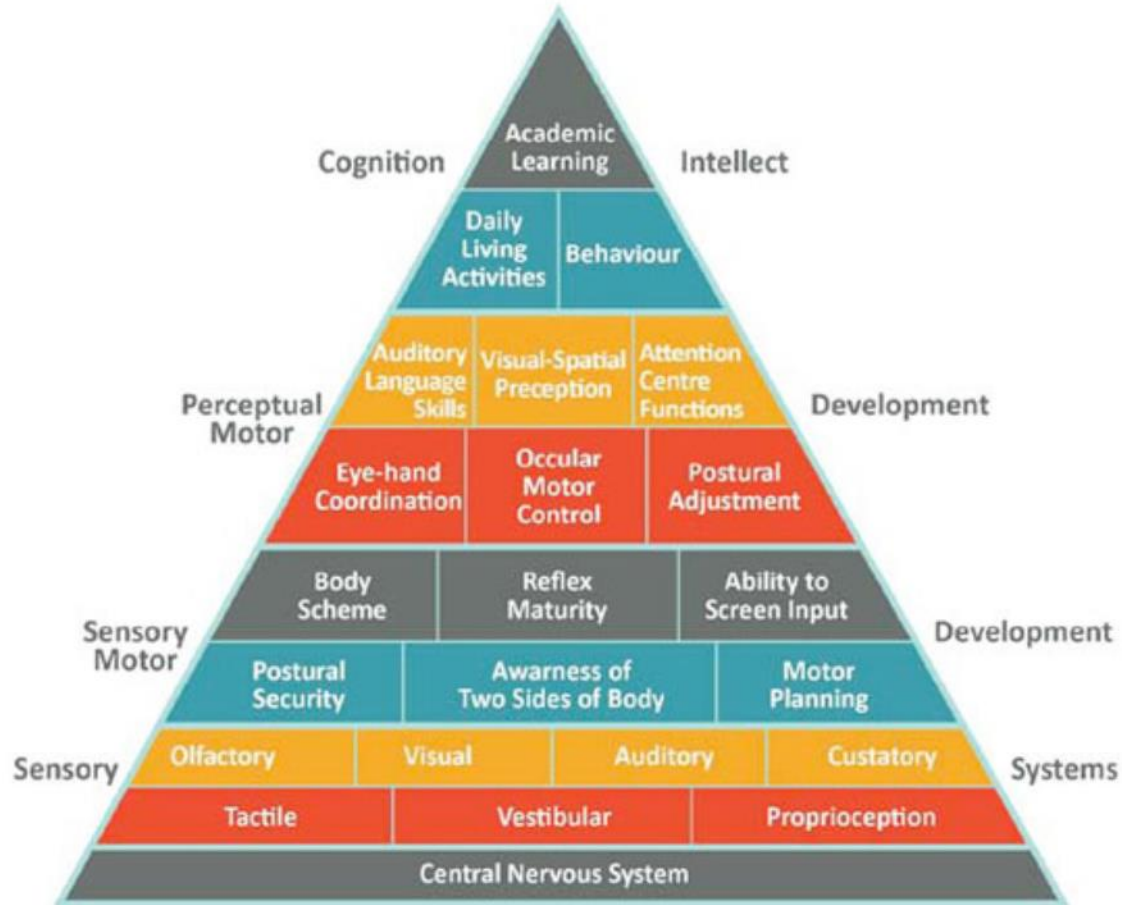
Responsible for:

- Registering hunger, thirst, temperature, bladder, bowels, emotional state and so much more

*Take a minute to feel your body sensations.*

*Think about how your body feels when you are nervous/angry?*

# PYRAMID of LEARNING



Williams and Shellenberger, 1996

# Recap on the sensory systems

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<https://www.youtube.com/watch?v=zd0NJ-J645w>

# Before identifying difficulties first you need to identify which sensory systems are being used

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Activity:

Using the pictures identify which sensory systems are at work within your group.









# Sensory Differences

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- What are they?
- What might they look like?
- Why might they occur?

# What are they?

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- When someone has difficulty interpreting or responding to sensory stimuli in the environment
- If it creates a functional difficulty for that person
- Can cause distress, anxiety and pain
- May result in socially inappropriate responses to events or situations
- Linked to the fight, flight and freeze response of the nervous system

# Risk factors

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- Autism
- Adhd
- Prematurity particularly if hospitalised
- Trauma
- Neglect at crucial stages of development
- Being exposed to drugs in utero
- Developmental delays

# What differences may occur?

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Sensory Modulation is the ability to interpret and respond appropriately to sensory stimuli.

Modulation differences include being over responsive or under responsive to sensory input.

You can be over responsive in one system or under responsive in another.

This causes a person difficulty in responding to those inputs as they either receive too much information or too little to make an accurate assessment and reaction.

# Further differences

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- Dyspraxia – individuals with dyspraxia have difficulty organising, planning and carrying out new motor tasks. They may have difficulty with postural control, stamina and balance.
- Discrimination – individuals may have difficulty determining what they are feeling (for example putting your hand in your bag to find your keys)



<https://www.youtube.com/watch?v=aPknwW8mPAM>



# Sensory Modulation or Reactivity

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- Individuals may be under responsive (hypo) to sensory input within certain systems and therefore not respond to them or seek more input to get the feeling
- Individuals may be over responsive (hyper) to sensory input within certain systems and therefore 'over react' to what others perceive as ordinary input

# Sensory Detectives

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- Not all children will be able to tell you why they are responding the way they do
- To them this is 'normal' they may not understand why others can cope with what they can't
- Masking is a thing!
- We need to observe children to determine why they may be having difficulties

# What behaviour may you see in terms of Proprioceptive reactivity?

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Hypo-reactivity	Hyper reactivity
<ul style="list-style-type: none"><li>• Seeks climbing, jumping, crashing and rough play</li><li>• Uses too much force in every day activities</li><li>• Could be clumsy</li><li>• Crouches, squats on chairs</li><li>• Could be floppy (poor postural control)</li><li>• Finds sitting on the carpet difficult</li><li>• Chews clothes, pencils etc...</li><li>• Seems to break everything without meaning too</li><li>• Seeks crawling under things/deep pressure</li><li>• Loves tight hugs/squeezes</li></ul>	<ul style="list-style-type: none"><li>• Avoids big movements</li><li>• Seems to use movements too small for the task in hand</li><li>• Sits very still</li><li>• Avoids playground games</li></ul>

# What behaviour may you see in terms of Vestibular reactivity?

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Hypo-reactivity	Hyper reactivity
<ul style="list-style-type: none"><li>• Seeks spinning activities</li><li>• Likes to hang upside down</li><li>• Never seems to get dizzy</li><li>• Always on the move</li><li>• Tips on chair</li><li>• Likes to climb and jump</li><li>• Fearless</li></ul>	<ul style="list-style-type: none"><li>• Prefers quiet and sedate activities</li><li>• Avoids playground equipment</li><li>• Likes feet on the floor at all times</li><li>• Seems unsteady or unsure on stairs</li><li>• Car sick</li><li>• Movement sickness</li><li>• Dislikes busy, crowded places</li></ul>

# What behaviour may you see in terms of Auditory reactivity?

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<b>Hypo-reactivity</b>	<b>Hyper reactivity</b>
<ul style="list-style-type: none"><li>• Inconsistent understanding of language</li><li>• Appears not to hear such as when name is called</li><li>• Makes lots of noises (could be the opposite problem!)</li><li>• Unconcerned by loud noises or appears not to hear them e.g. doesn't react when fire alarm goes</li><li>• Likes loud music</li><li>• Responds best when another sensory system is involved alongside e.g. touch to talk</li></ul>	<ul style="list-style-type: none"><li>• Covers ears at loud noises or any noise</li><li>• Can hear things that others can't</li><li>• Seems distracted by things that are unclear</li><li>• Dislikes certain people because of their voice</li><li>• Prefers certain tones</li><li>• Reacts to some pitches of music</li><li>• Dysregulated by unexpected sounds</li></ul>

# What behaviour may you see in terms of Tactile reactivity?

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## Hypo-reactivity

- Needs to touch everything
- Loves messy play
- Can create messy play in a variety of situations
- May crave particularly textures
- Touches inappropriately e.g touching other peoples clothes
- Difficulty interpreting pain or temperature
- Stripping...

## Hyper reactivity

- Hates messy play
- Avoids physical contact
- Distressed when touched particularly when taken by surprise
- Clothing can irritate them
- Can be distressed by being outside
- Sometimes carries a shield (a toy in hand to avoid touching)
- Bath/shower is distressing and needs to be 'just right' if accepted at all.
- Hates kisses
- Self care tasks can be difficult

# What behaviour may you see in terms of Gustatory reactivity?

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<b>Hypo-reactivity</b>	<b>Hyper reactivity</b>
<ul style="list-style-type: none"><li>• Uses mouth to explore past general age or developmental stage</li><li>• Eats inedible substances</li><li>• Likes very strong tastes</li><li>• Mixes flavours e.g. sweet and sour</li></ul>	<ul style="list-style-type: none"><li>• Distressed by taste or textures</li><li>• Physically gags or is sick</li><li>• Very limited diet</li><li>• May only drink out of certain cups/bottles</li></ul>

# What behaviour may you see in terms of Olfactory reactivity?

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Hypo-reactivity	Hyper reactivity
<ul style="list-style-type: none"><li>• Need to smell everything or smell people</li><li>• Doesn't appear to notice unpleasant odours</li><li>• Enjoys very strong smells in food and often spicy/flavoursome.</li></ul>	<ul style="list-style-type: none"><li>• Distressed by certain smells</li><li>• Tries to escape from certain environments e.g. restaurants/school cafeteria</li><li>• Physically gags or is sick</li><li>• Holds hand over face</li><li>• Dislikes certain people due to perfume or washing powder</li></ul>



# What behaviour may you see in terms of Visual reactivity?

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## Hypo-reactivity

- Difficulty identifying elements of puzzles, pictures or learning to read
- Difficulty locating items amongst other items
- Difficulty tracking moving objects
- Difficulties with depth perception

## Hyper reactivity

- Easily distracted by visual stimuli even if it appears minor
- Distressed by bright lights
- Squints, rubs eyes, complains of headaches
- Fear of or desire to be in the dark

# Sensory Needs and Behaviour

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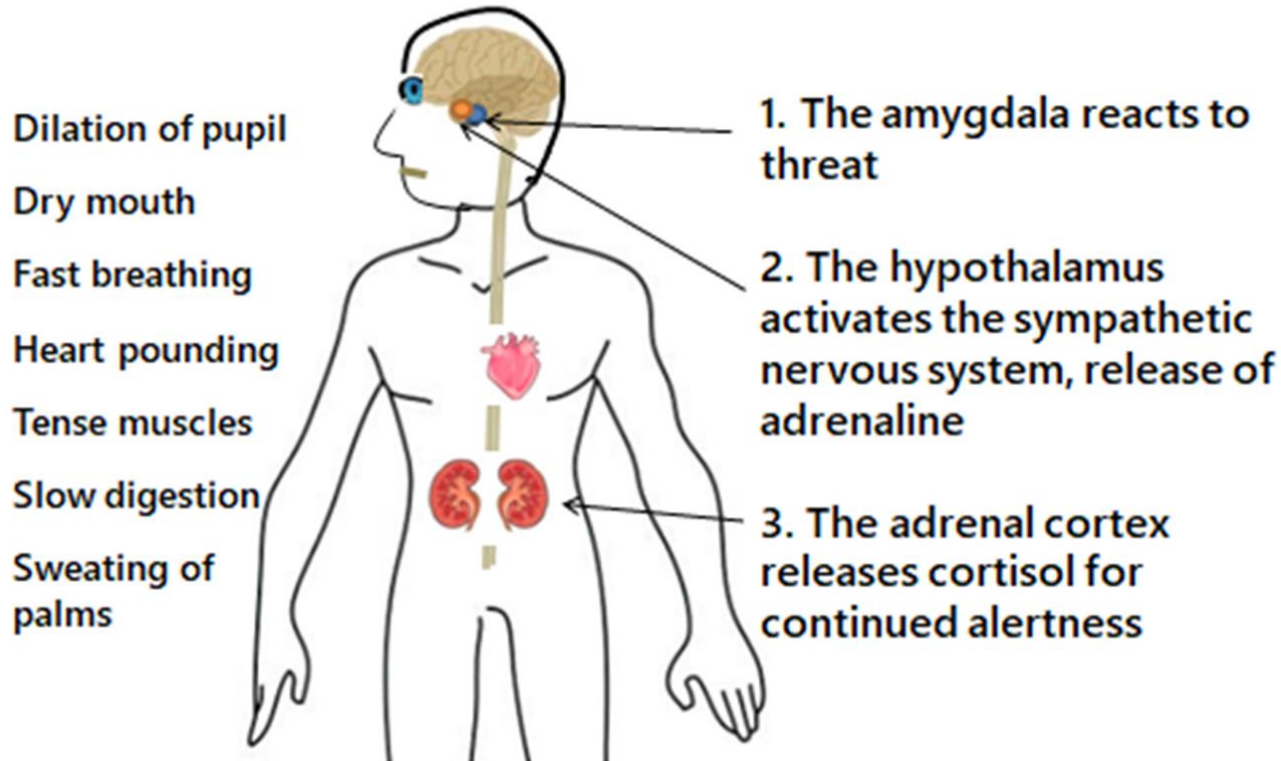
- Fight, Flight, Freeze
- Seeking
- Avoiding
- Control – when the world is out of your control, every day experiences cause you distress or pain or you are constantly fizzing... children will seek to control what they can to try and feel safe in a world which feels unsafe to them.

# Fight, Flight or Freeze

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No longer in control...

## The fight or flight response



Sensory interventions before this point

Hyper alert state can become continuous

# Be a Sensory Detective

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- Start a diary (one week). Observe the child in as many situations as possible. List what they seem to find easier and what they find harder. For those things they find harder note down what happened before and after the event.
- Speak to parents – inform them that you are observing their child for potential sensory differences and ask them if there is any unusual behaviours at home (you will be surprised!)
- If you are able to set up a range of play/physical activities with the child in a low key way and chat with them about what is easy and what is not
- Sit back and digest what you have observed. Think about the sensory systems the child needed to use to perform those actions or what their actions were triggering in a sensory system.

# Next Steps

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You have some observational notes

You think the child may be experiencing difficulties with sensory processing

Now you could complete a sensory profile checklist to look wider

It is always helpful to do one for school and one for home completed by the parents/carer

[https://www.locala.org.uk/fileadmin/Services/Sensory\\_OT/AET\\_Individual\\_Sensory\\_Checklist.pdf](https://www.locala.org.uk/fileadmin/Services/Sensory_OT/AET_Individual_Sensory_Checklist.pdf)

# Interpreting Sensory Checklists

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Key points to remember:

It's a tool not a diagnosis

Ticking yes for a few points does not automatically mean there are sensory differences

It's a way of viewing the child holistically and looking across environments

It can flag up difficulties you may not have even thought of yet

# What to do with the results...

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By combining talking to the child, parents, observations and a checklist you should have a fairly good overview of what may be happening.

Look at all the information and think ‘What sensory systems are at work here?’

Divide up the difficulties you think you are seeing between over reactive, under reactive and unsure (sometimes it’s not too clear straight away!)

# What is interoception?

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“Interoception allows us to “feel” our internal organs and skin and gives information regarding the internal state or condition of our body”

(Craig, 2002).



# Interoception sensations:

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- Body temperature
- Itch
- Heart rate
- Pain
- Hunger
- Thirst
- Sexual arousal
- Muscle tension
- Breathing rate
- Sleepiness
- Need for toilet
- Pleasant/uncomfortable touch
- Noise

# Interoception Extremes

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- Too big/strong/overpowering  
too many internal body signals noticed all at once
- Too small  
muted, internal sensations go unnoticed or not noticed until they become intense
- Distorted  
Internal body signals are noticeable but not enough to locate the body part or type of feeling

(Mahler, 2021)

Hyper-responsiveness of the interoceptive sense may present in a child as over-responsiveness or overreaction to interoceptive sensation. This may look like:

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- Distracted and overwhelmed by feelings of stress
- Distracted or overly sensitive to sensations of stomach digestion
- Distracted or overly sensitive to sensation of heart beat
- Always hungry or thirsty
- Eat more and more often to avoid feelings of hunger
- Unable to sense the feeling of being full; overeats or overdrinks
- Overwhelmed by feelings of sadness, anger, happiness, etc. and unable to respond appropriately
- High urine output
- Use the bathroom more often than necessary to avoid feelings of a full bladder or bowel
- Distracted by changes in body temperature
- Distracted and overly sensitive to sweating
- Overly sensitive to feeling ticklish or itchy
- Overly sensitive to cold or heat
- Overly sensitive to signs of illness
- Fearful of vomiting

Hypo-responsiveness of the interoceptive sense may present in a child as under-responsiveness or underreaction to interoceptive sensation. This may look like:

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- Poor or low response to interoceptive stimuli
- Doesn't know when to go to the bathroom
- Never says they are hungry or thirsty
- Does not drink or eat enough
- Difficult to toilet train
- Never complains of being cold or hot (always wears shorts in the winter or pants in the summer)
- Never complains of sickness
- Difficulty falling asleep
- Unable to identify feelings of stress
- Unable to identify specific feelings and appropriate responses

# Interoception and emotions

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- Poor and atypical interoception is a key factor in emotional regulation difficulties and managing self.
- Each emotion is felt differently in the body – without feeling different sensations it is difficult to clearly identify emotions.
- Interoception supports self-regulation by alerting us to take action when sensations identify that our internal balance is off.

Goodall (2019); Mahler (2017)

# Developing Interoception

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**HOW TO TEACH INTEROCEPTION (CONNECTION TO SELF).  
A PRE-REQUISITE FOR SELF-REGULATION.**

# Examples of meeting sensory needs

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- Sensory diets – individualised plans specifically stating needs and activities
- Adjustments to the settings
- Individual plans e.g. de sensitisation plans
- Sensory passports

# Sensory Flowchart and Quick Fixes

