

# Sensory processing and everyday life



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## 1 Definition

'Sensory Integration sorts, orders and eventually puts all the sensory inputs together into whole brain function.' Ayres (1979) What emerges from this process is increasingly complex behaviour, the adaptive response and occupational engagement.



## 2 Theory

Sensory Integration is a theory based on the concept that brain "maturation is the process of the unfolding of genetic coding in conjunction with the interaction of the individual with the physical and social environment. As a result of experience, there are changes in the nervous system." (Spitzer and Roley 1996)



Sensory qualities of the environment can positively or negatively interact with function and development. (Schneider et al, 2008)

## 3 Process of typical development

Ayres, 1979, believed that sensory integration is integral to the process of healthy development "when the functions of the brain are whole and balanced, body movements are highly adaptive, learning is easy and good behaviour is a natural outcome"



## 4 Disorder

Sensory processing difficulties can influence self-regulation, movement, learning and interaction with others (Allen & Smith, 2011).

It can interfere with skills that support performance, such as engagement and attention, as well as skills that enable the learning of new motor skills (Cosby, 2010; Jasmin, 2009).

## 5 Therapeutic approach

### 1. Sensory Integration Therapy - Direct 1 to 1 therapy

With an Occupational Therapist, Physiotherapist or Speech and Language Therapist with postgraduate training, in an environment providing a variety of sensory opportunities adhering to Sensory Integration fidelity tool (Parham, 2007).

Evidence identifies changes following Sensory Integration Therapy to goals set by family and therapists through Goal Attainment Scaling (Miller, 2007).

- functional behavior
- motor skills
- attention
- cognitive skills
- social skills
- self-harming
- self-stimulation

\*minimum standards are recommended by the International Coalition for Excellence in Sensory Integration

## 6 Functional impact of sensory systems

### Vestibular

This is like a spirit level telling our brain what position our head is in.

Our sense of balance enables:

- balance and dealing with gravity when we are moving
- helps us understand direction and speed
- a stable visual field
- comfort with movement
- ability to sustain postures
- using two sides of the body (bilateral integration)
- spatial skills
- visual motor skills



### Proprioception

This is from muscle stretch receptors that enable us to have a sense of body awareness

Our sense of proprioception when added to other senses enables:

- movement understanding including speed, rate, sequence, timing and force
- body awareness - knowing how our body parts relate to each other
- the brain to send the right outgoing information to joints, muscles and tendons about how to move and adjust body positions to allow skilful purposeful co-ordinated movement which are
- smoothly graded correctly timed and with
- just the right amount of pressure



Adequate proprioception is essential for development of praxis and co-ordination - motor planning.

### Tactile (touch)

Touch is vital to our survival. The skin is filled with tactile receptors. They are placed at different levels under the skin in both the upper and deeper layers.

Touch receptors give us information about the world around us, others people and things we are using including:

- light or heavy touch pressure
- textures : hard, soft or fluffy
- intensity of touch : sharp or dull
- temperature eg hot or cold
- pain

Our tactile sense enables us to:

- understand and develop emotional bonding
- oral-motor skills
- hand skills

### Visual (vision)

The visual sense provides details about the world around us:

- colour,
- contrast
- line
- shape
- line
- movement

It enables:

- visual tracking
- how we perceive the world
- how we determine what to pay attention to and what to ignore
- us to direct our actions and movements
- to understand more information about objects and people
- us to define boundaries as we move through time and space

### Auditory (hearing)

Provides more information about what is happening in the world around us from sounds in the environment:

- Tone and Pitch : high or low
- Volume : loud or soft
- Rhythm and sequence of sounds
- Distance: Near or Far

It enables:

- learning to hear
- understanding what is heard including speech
- being able to speak
- auditory memory
- some spatial orientation including distance and speed

### Gustatory (taste) and Olfactory (smell)

Information from chemical receptors in the mouth and nose. These 2 senses are closely linked

Taste receptors tell us if something is: **Smell also provides extra information including:**

- Sweet
- Sour
- Bitter
- Salty
- Salty
- Musty
- Putrid
- Umami (savouriness)
- Pungent

Smells have very strong associations with good and bad memories

Taste and smell are protective:

- helping alert us to danger
- ensuring we avoid eating poisonous or rotten substances
- they can help influence choice of dietary needs.

## 2. Consultation by a qualified therapist

Consultation offers a chance to re-frame behaviours with new understanding -

A therapist-client-carer opportunity to collaborate to develop strategies to overcome challenges (Bundy, 2002).

May include:

- Assessment to identify sensory processing concerns
- Parent or staff education to reframe behaviours or motor difficulties
- May involve exploring daily routines and building strategies and activities into that routine

## 3. Off the Shelf Programmes - off the shelf programme, available to all

- Ideally delivered by suitably trained professionals
- Less research is available in this area, but developed through careful clinical reasoning

- Based on sensory integration theory

Some of the useful tools are available from:

[www.ateachabout.com](http://www.ateachabout.com)

Author: Diana Henry

- Tools for Teachers (2001)

- Tools for Teens (2004)

- Tools for Tots (2007)

[www.alertprogram.com](http://www.alertprogram.com)

Authors: Mary Sue Williams and Sherry Shellenberger,

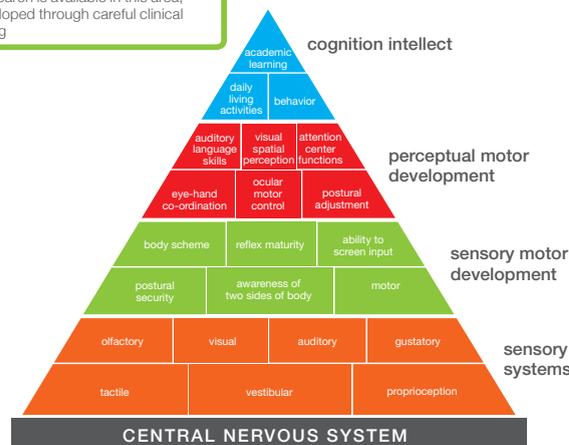
- How Does Your Engine Run?® A Leader's Guide to the Alert Program® for Self-Regulation (1996)

- Take Five (2001)

[www.starservices.tv](http://www.starservices.tv)

Authors: Carolyn Murray-Slutsky and Betty Paris

- Is it Sensory- Is it Behaviour? (2004)



adapted from Taylor Trott 1991

## References

Ayres, A.J. (1979) Sensory Integration and the Child, Western Psychological Services  
 Bundy EA et al (2002) Sensory Integration: Theory and Intervention FA Davis  
 Cosby J, Johnston SS (2010) Sensory Processing Disorders and Social Participation AJOT May/June 2010 64(3): 462-473  
 Jasmin et al (2009) Sensor-motor and daily living skills of preschool children with autistic spectrum disorder. Journal of Autism and Developmental Disorders 39(2):231-241 Parham, D., Eckes, C. (2007). Sensory processing Measure - Home. Los Angeles: WPS  
 Miller L (2007) Concept Evolution in Sensory Integration: A Proposed New Neurology AJOT 62(2):135-140  
 Parham, L.D et al (2007) Fidelity in Sensory Integration Intervention Research. American Journal of Occupational Therapy, 61, 216-227.  
 Schneider M et al (2008) Sensory Processing Disorder in a Primate Model: Evidence from a longitudinal Study of Prenatal Alcohol and Prenatal Stress Effects. Child Development, 79(1) pp 1000-11  
 Smith-Riley et al (2001) Understanding the nature of Sensory Integration with Diverse Populations. Therapy Skill Builders, Harcourt Health sciences ISBN 0-7816-1515-6



[www.sensoryintegration.org.uk](http://www.sensoryintegration.org.uk)