

SENSORY INTEGRATION

Sensory Integration is the process by which the brain takes in and interprets information about the body and its surroundings. This information is then used to control and organise the body.

Sensory Integration [S.I.], [sensory processing], refers to the skills & performance in developing & coordinating sensory input, motor control & sensory feedback in a smooth process. More specifically, sensory integration is the organisation of sensory input for use. The use may be a perception of the body or the world, a response adapted to the environment, a learning process, or the development of some cognitive function.

Through sensory integration, the many parts of the brain work together so that a person can interact with the environment effectively & experience appropriate achievement in daily activities.

It involves how effectively & efficiently a person is able to process sensory information from the tactile [touch], vestibular [movement sense], proprioceptive [body position sense], visual [looking], auditory [hearing], olfactory [smell], & gustatory [taste] systems.

Sensory integration is that part of the life process involving the organisation & use of sensory information before birth & throughout life.

Development Normally, good sensory integration is developed in the early years as the child explores his body and environment, learning about the way they work together. This subconscious awareness provides the foundation for learning and behaviour. It enables the child to be comfortable with the way his/her body moves and confident about ability to do as he/she wishes. It frees him/her to develop the higher functions within his/her brain.

The information which the brain needs comes from the various senses.

The development of the basic sensory systems and the integration of their information in the lower part of the brain (automatic processing) are necessary before higher-level skills appear.

Normally children practice and perfect their skills; these are then 'programmed' into the lower brain and become automatic – the child does not have to think about them.

With the child with poor sensory integration, these basic movement patterns are not automatic – the child has to consciously think about their movements and this makes them slow and clumsy.

The sensory systems:

- Tactile: helps to develop -
- Emotional development through bonding
- Development of body scheme
- Skills of tactile perception; motor planning; sequencing; organisation
- What can you feel? 1 / 2 point touch on hand

Vestibular: helps with –

- Postural development – enabling us to master gravity
- Manage body movements through space, enables stable visual field, bilateral coordination
- Works closely with proprioceptive system

Proprioception: helps with –

- Alignment of body parts
- Modulation of mid range
- Precision of movement
- Body image
- Knowledge of position in space

What is Sensory Integrative Dysfunction? Sensory Integrative Dysfunction or Sensory Integration Disorder refers to an inability to use sensation effectively to make an appropriate response to fulfill demands from the environment. It can be found frequently but not invariably among children with speech & language delay, behaviour problems, learning disorders, minimal brain dysfunction, more severe neurological disorders such as autism & general developmental delay.

You can have problems with A, B, C or all.

A. Modulation: CNS function of adjusting the intensity and duration of stimuli effecting change in threshold thereby regulating neural activity. To modulate means to soften, temper or tone down the intensity of something, in this case sensory input. (i.e. filter out things you don't need to feel – clothes on body)

Disorder:

- Sensory defensiveness – unable to regulate
- Gravitational insecurity
- Aversive responses to movement

B. Registration and /or discrimination: Initial CNS response to a stimuli and the ability to distinguish the qualities, similarities and differences of the stimuli. Slow versus fast.

C. Praxis: In S.I. theory, praxis refers to the ability to plan new movements

D. Disorder:

- Somatodyspraxia
- Visiodyspraxia
- Praxis on verbal command
- Bilateral and sequencing
- Posturalocular

E. Combination: Sensory Integrative Dysfunctions [SI] It has been estimated that a significant percentage [approx. 10%] of children in the United Kingdom have trouble learning although they have normal or above average intelligence. Some are clumsy in sports & household activities, although they have had the usual

opportunities to develop coordination. Other children behave disruptively, although they have been adequately nurtured by their families.

What is wrong with these children? Research has shown that children with learning disabilities, poor organisation & behaviour problems often do not sense the world normally. Their bodies & brains do not use sensations correctly to produce normal, organised learning, movement & behaviour. These are problems which occur deep inside without the child's conscious control.

What can we do to help these children? It is of paramount importance to recognise that the child has a 'good' brain but that there is some confusion in the activities of that brain! Then we must find a way to get the normal sensations of life to flow through the brain & activate the normal organising responses of childhood.

Dr. A. Jean Ayres, an Occupational Therapist, a pioneer in the treatment of children with learning & motor organisation problems combined studies of the brain function with years of experience of working with children. Ayres found that by directing & controlling the input of different senses, i.e. sensory input through vision, hearing, touch, body movement, etc. through sensory integrative therapy, children were able to learn & organise behaviour more effectively at home & school.

Sensory Integration Therapy Sensory Integration is a therapy approach that involves controlling sensory stimulation in order to elicit an 'adaptive response' according to the child's brain functions. Therapy usually involves activities that provide Tactile [touch], Proprioceptive [body position sense] & Vestibular [body movement sense] as stimulation. Sensory Integration Therapy is an approach to treating children with poor sensory integrative function.

Principles: Accurate assessment of child's difficulties is vital in order to find out where the child's problems lie, and how to plan treatment effectively.

- Child/therapist interaction (intensive)
- Child guided. (Often the child seeks out the sensory input he/she needs)
- Therapist aims to help the child to find this out for him/herself and guides in the right direction so that he/she gets maximum benefit.
- Aims to raising the child's self-confidence and therefore get away from success and failure.
- Does not aim to teach the child how to perform/carry out specific tasks but 'helps the child to learn', i.e. by using the sensory systems help the brain to organise itself.
- Uses play and different types of equipment
- How child interacts appropriately with their environment.

Sensory Systems in Therapy

Tactile system may need 'waking up' by light touching, furry tunnel, massage, brushing or 'calming down' through deep pressure, wrapping up tight.

Proprioceptive system very much relates to posture and awareness of body parts. Often on floppy children work on muscle groups around a joint through proprioception to develop posture and give sensory input regarding a certain body part.

Vestibular system.: slow rhythmical vestibular stimulation has a calming effect and faster vestibular

stimulation has a facilitating [excite] effect. It is used in therapy for its influence in stimulating the brain to organise itself.

What equipment *might* be involved in a therapy session ?

scooter boards	tyre tunnel	therapy balls
wobble board	hoops	rolls
swings (tyre and hammock)	feather dusters	ladders
spinning boards	stretchy rope	therapy mats

Therapy is NEVER PASSIVE – the child is NOT spun and spun!

Therapy is graded to “just the right challenge”.

One piece of equipment can be used to stimulate different senses depending upon how it is used.

The therapist aims to balance the stimulation due to its effect on behaviour:

- organisation of the treatment session (beginning and end)
- to help the child to get used to change.

General Points:

- Younger children respond better than older children
- S.I. therapy provides a stimulus to the brain’s development & the momentum often continues for some time after the therapy ends.
- It often cannot totally alleviate the problems but the child usually improves to some extent.
- Sometimes, for the first few sessions, children may be unusually aware, excited or energetic after therapy.
- Often other treatment approaches are used in conjunction with S.I therapy or after it has provided the initial stimulus.

Sensory Integrative therapy does not involve medication, special diets and no ‘regimes’ are imposed on the child. This therapy differs from most educational & psychological approaches in that it does not train specific skills or behaviours such as picture matching, sequencing sounds, tying laces or sitting quietly! Rather, the objective is to enhance the brain’s ability to learn & organise behaviour.

Instead of treating the symptoms, this therapy approach attempts to ameliorate the underlying conditions. One important aspect of this approach is that the activities are selected SPECIFICALLY to motivate the child to participate ACTIVELY in the sessions.

The Therapist will work on a 1:1 with the child to ensure that, in time, the child freely chooses the activities which organise his or her brain, [albeit at a subconscious level]. The child learns spontaneously while

bending, turning, riding, rolling & swinging on the specialised equipment provided by the Therapist. Gradually, the child becomes more relaxed & alert in the sessions & this transfers into other situations.

After therapy, the child will become more aware of the environmental demands & will respond more positively & appropriately to it. It is then hypothesised that the child's brain begins to allow the child to learn more effectively.

When a sensory integrative approach is successful, a child is then able to automatically process complex sensory information in a more effective manner than previously. An improvement in motor organisation may become apparent by the child's ability to perform gross & fine motor tasks with greater skill & at a higher level of complexity.

For the child who initially presented with behaviour problems related to under—& over —responsiveness to sensory stimulation, a more normal response may lead to better emotional adjustment, improved interactive social skills or greater self-confidence.

Some children will demonstrate gains in language development while others will improve significantly in their attention control & learning as the brain begins to function more effectively.

In brief ...

Assessment:

1. Referral information
2. Other professional evaluations
3. Developmental and sensory histories – Questionnaire
4. Standardised assessment tools – sensory profile, VMI, MVPTR, ABC, TVPS,
5. Clinical observations

Therapy treatment :

1. Improve the registration, discrimination & integration of sensory input.
2. Increase awareness & strength in selected muscles for postural control & movement patterns
3. Develop adequate body scheme
4. Increase the complexity of adaptive response
5. Enhance ideational skills
6. Improve organisation of behaviour
7. Address functional performance deficits

The Therapist facilitates sensory integration by applying NEUROPHYSIOLOGICAL & DEVELOPMENTAL principles through PURPOSEFUL activities!