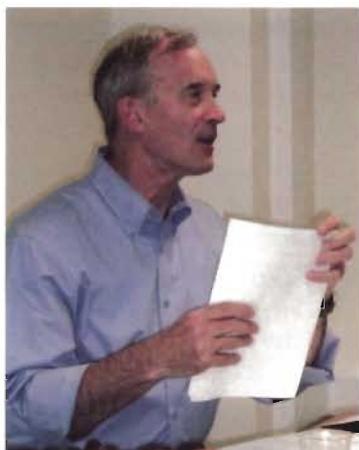


# The sensory integration perspective and what it offers us in the field of deafblindness

David Brown, Education Specialist at California DeafBlind Services concludes his series about the senses – with the first part of an article about sensory integration



In this final two-part article I want to look at what I call ‘the Sensory Integration perspective’ and consider why I think it offers us a very helpful way of thinking about the children with whom we work. First, though, I need to explain a little about the term ‘sensory integration’ because it refers to three closely related but different things:

**1** It is a neurological process that begins while a foetus is developing, so that sensory systems are already starting to function for the unborn child, producing responses and learning inside the womb that will continue after birth. We know, for example, that tactile sensory receptors in the lips of a foetus are working from 7 weeks gestation, and that a 16 week old foetus will self-initiate tactile stimulation,

especially around the mouth area. The taste system begins forming from 8 weeks gestational age. The entire vestibular system is formed and working by 21 weeks gestational age, so that excessive movement and position changes by the mother can produce evidence of vestibular overstimulation in the foetus. The entire auditory system is formed and working by 24 weeks gestation and at this age the foetus can exhibit consistent calming or arousal (and movement) responses to specific external sounds. As the nerve fibers carry information from several different senses, all at the same time, the brain processes them simultaneously so that the senses seem to function together automatically. In fact each sense is designed to develop in this way so that it

becomes even more effective as a part of the ‘symphony of the senses’ than it is on its own. As a result, when this sensory integration is working well, for most of the time none of us has any conscious awareness of each individual sense working, and we are free to focus our conscious minds on higher order activities even though the combined input of all these different sensory impressions is providing a constant multidimensional flow of essential information to our brains. When everything is working well most of our sensory perception and processing works on ‘automatic pilot’, and only when there is an unexpected or unusual sensory input are we challenged to attend consciously to the information we are receiving through that specific sensory channel.

Laura swinging



**2** ‘Sensory integration’ is also a theory developed in the 60s, 70s, and 80s by Jean Ayres, an occupational therapist, to try to explain exactly how all the different pieces of information coming in from all the separate senses get connected and blended together so that we function effectively. Ayres was working with learning disabled children who were



**Deep pressure and rhythmic movement**

exhibiting certain concerning behaviours – they were distractible and inattentive, unusually over-active or under-active, clumsy, poor at handwriting, and other things that hampered academic achievement. She emphasized the important role of the tactile, proprioceptive, and vestibular senses in providing a secure foundation for the effective use of the vision and hearing senses. She also examined the relationship between information coming into a person through their sensory systems and the way the brain interprets this information and then responds to it (with what are known as 'adaptive responses'). Ayres defined sensory integration as :

*"... the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment. The spatial and temporal aspects of inputs from different sensory*

*modalities are interpreted, associated, and unified. Sensory integration is information processing... The brain must select, enhance, inhibit, compare, and associate the sensory information in a flexible, constantly changing pattern; in other words, the brain must integrate it."*

**3** It is a treatment approach (known as Sensory Integration Therapy) which Ayres derived from her theory, that looks at how sensory information is received by an individual and what adaptive responses they make. Since Jean Ayres died in 1988 these ideas have continued to be developed by other occupational therapists and physiotherapists trained in Sensory Integration Therapy. The approach now includes consideration of many related issues including sensory perception and sensory processing, motor planning, arousal levels and self-regulation of these,

sensory overloading, and sensory defensiveness. These days many teachers and teaching assistants in the field of Special Education have become familiar with some aspects of the therapy technique by seeing it used with children and also by being required to administer parts of the therapy program themselves, although they rarely receive any training in the approach itself nor in the theory behind it.

Geegee Larrington has written an excellent chapter on Sensory Integration Therapy in 'Understanding Deafblindness', which provides a concise but comprehensive overview of the basic principles on which it works. In the limited space available to us here I want now to take a brief look at Ayres' theory and then at some aspects of the therapy approach that are especially relevant to children with deafblindness.

**“When everything is working well, most of our sensory perception and processing works on 'automatic pilot', and only when there is an unexpected or unusual sensory input are we challenged to attend consciously to the information we are receiving through that specific sensory channel.”**

“...the focus on the tactile, proprioceptive, and vestibular senses gives us an invaluable way of looking at children with deafblindness and trying to ascertain what is really happening to them, what and how they are perceiving, how they are processing, and what is really motivating them.”

### Sensory Integration Theory

Ayres drew on a number of disciplines including neurology, psychology, occupational therapy, and education, and based her theory on a number of assumptions – namely the idea that interactions between a child and their environment have a significant impact on brain development, that the brain is plastic (that is, capable of changing in response to external stimuli), and that experiences resulting from sensory inputs and the child's responses to them influence the way that the brain changes.

### Sensory Integration Therapy

The key principles of the therapy approach can be summed up as follows:

**1** The Just Right Challenge – so that the child is challenged by the chosen activities but their success is guaranteed. This demands a good knowledge of the child, including things like their sensory perception and sensory processing abilities, processing time, movement skills, attention span, short-

term and long-term memory, sensory preferences, and their confidence in themselves and in us.

**2** The Adaptive Response – the child must adapt their responses as a result of these ‘just right’ challenges, and they learn from the new strategies they devise and so improve their functioning.

**3** Active Engagement – the child must be motivated and want to involve themselves in the activity, so that they are, in fact, reorganizing their own brains. This means that we need to spend time identifying the motivators for each individual child and then using them in the activities. In our population of children the strongest motivators might be very subtle and quite difficult to discover, or they might seem very odd to us sighted hearing adults and not be what we would ever consider motivating at all, or they might involve behaviours that many would just describe as ‘self stimulating’ and only try to stop.

**4** Child Directed – as a result of careful and skilled observation the therapist is directed by the child's

preferences, needs, and current abilities. Continuing observation during the sessions should lead the therapist to increase or decrease the sensory and motor demands of the activities as appropriate so that points 1 to 3 above are respected at all times.

Ayres explained succinctly that:

*‘A sensory integrative approach to treating learning disorders differs from many other approaches in that it does not teach specific skills... Rather, the objective is to enhance the brain's... capacity to perceive, remember, and motor plan... Therapy is considered a supplement, not a substitute to formal classroom instruction...’ (1972)*

This emphasis on the process of learning, rather than just on the acquisition of new skills, fits in well, as Geege Larrington points out, with the idea that education for children with deafblindness should aim to develop understanding of concepts and not just teach skills. In her chapter on sensory integration in ‘Understanding

“This helps to move us from too exclusive a focus on cognitive skills, which is very often found in the field of special education.”



**Enjoying deep pressure squeezing**

Deafblindness' Larrington includes a helpful glossary of terms and concepts used in this therapy approach (p. 248 – 251), which not only defines terms but also provides a lot of wise advice on how to behave with any child who has difficulties with sensory integration, for whatever reason. The specific objectives of sensory integration therapy can be listed as follows:

- To achieve and maintain an alert, calm state so that the child is not persistently tending to become excessively drowsy nor excessively over-excited but is in the best state for attending and learning.
- To promote the organization of the Central Nervous System (ie. the brain and the spinal cord), in other words facilitating that neurological process of sensory integration that I described earlier.
- To enhance the child's ability to regulate and



**Brandon gives himself extra proprioceptive input**

adjust the sensations from their environment, so that no sensory system is under or over reacting to stimulation, and the child is able to attend to what they need to and to ignore what does not need conscious attention. This should also reduce the child's need to be persistently seeking out or fleeing from stimulation through specific sensory channels.

- To increase conceptual development, which could be considered as the ultimate outcome for educationalists.

### Sensory Integration and the impact of deafblindness

It is important to remember that Ayres' theories and her therapy approach were not developed with reference to children with deafblindness or with significant multiple disabilities, and that there has been very little research on applying them to this population of children. The children with whom

we work do not only have difficulties in integrating all the messages coming in through their sensory systems, they also have entire senses missing or hardly functioning at all, plus a range of other challenges that did not feature in Ayres' research, such as physical disabilities, seizure disorders, and significant health issues. So why do I think it is so important to know about Ayres' work and that of the other therapists who have developed it further?

**a** First of all, the focus on the tactile, proprioceptive, and vestibular senses gives us an invaluable way of looking at children with deafblindness and trying to ascertain what is really happening to them, what and how they are perceiving, how they are processing, and what is really motivating them. This helps to move us away from too exclusive a focus on the senses of vision and hearing, which has traditionally existed in the field of deafblind education.

**b** Experience has shown that the theory that these three sensory systems provide the foundation for effective visual and auditory functioning is very helpful in practice, even (or especially) for children with severe multi sensory impairments and a high level of medical and nursing needs. And the

“We all have sensory strengths and areas of need, and we all experience certain kinds of sensory integration dysfunction at different times in our lives, and for different reasons.”

knowledge that we have gained from this experience helps us to prioritize better in our educational assessment and programming and be more successful in helping children to develop their visual and auditory and tactile abilities.

**C** Both the theory and the therapy approach use concepts like sensory diet, sensory overloading, sensory hierarchies, sensory thresholds, and arousal levels and self-regulation, all of which can help us to understand children’s behaviour that otherwise would seem to be quite paradoxical or inexplicable. This helps to move us from too exclusive a focus on cognitive skills, which is very often found in the field of special education.

**d** The idea that each child has their own needs and preferences, and that these should determine and guide our intervention if only we have the skills and the patience and the willingness to see and to understand them, fits in well with the ‘follow the child’ approach of influential educational theorists in our field such as Jan van Dijk and Lilli Nielsen.

**e** We all have sensory strengths and areas of need, and we all experience certain kinds of sensory integration

dysfunction at different times in our lives, and for different reasons. Ayres’ approach puts a focus on ‘people’ rather than on ‘people with disabilities’ and so helps us to remember the common humanity (and the common challenges) that we all share with all children with deafblindness.

So here is a theory and treatment approach based on aspects of human experience and behaviour that are widely recognized even if they are not widely understood. Like all theories it is only good and useful if you use what works for you and the child and leave the rest, and there is growing anecdotal evidence that much of what Sensory Integration Therapy offers in terms of assessment and treatment has been of real benefit to many children with deaf-blindness. Geegee Larrington sums up the shift that has taken place when she writes that:

*‘The field of sensory integration, as practiced primarily by some occupational therapists, began in its classical form as a therapist-directed treatment in a therapy clinic with children at the high end of dysfunction. The sensory integration frame of reference, however, has evolved and has been applied to other diagnoses and infused into*

*educational and home programming for children all along the continuum of dysfunction’ (Understanding Deafblindness, p. 319)*

But this is a controversial area and people within the field of deafblindness still argue over what exactly is meant by the phrase ‘Sensory Integration Therapy’, they insist that only a fully qualified occupational therapist can do it, and they also say that its use with children with deafblindness has not been researched so it should never be considered for them. But anybody can, and most people do, rock a child to get their attention, or hug them tightly to calm them down, or bounce them gently to arouse them and wake them up, and so on, and all those actions, and their anticipated outcomes, are part of the spectrum of activities in Sensory Integration Therapy. As Ayres herself said:

*‘What is rocking and being cuddled other than tactile and vestibular stimulation plus an interpersonal relationship?’ (S.I. and Learning Disorders 1972, p266)*

**The second, and final part of this article will appear in the next edition in the Summer of 2009.**