Sensory integration dysfunction in deafblind children

Gail Deuce

For most of us, sensory integration occurs without conscious thought. That is, the organisation of information received from our different sensory modalities is then used to enable us to interact effectively within the world around us. In this article Gail Deuce, an experienced teacher of deaf and deafblind children, explores these ideas.

orking with deafblind children, I have become increasingly aware of a significant number within this population who appear to experience difficulties in this area. It is not unusual to hear a teacher describing the child who can use his residual vision effectively or use his residual hearing effectively, but not undertake both at the same time; or the child who has to stop walking to listen; or again the child who has to look away before reaching for a toy. More than this, some deafblind children appear to experience major sensory dysfunction, experiencing difficulty processing and integrating the information received from all their sensory modalities.

Ayres studied the process of sensory integration in children with moderate learning difficulties and equated it to information processing whereby:

The brain must select, enhance, inhibit, compare, and associate the Sensory information [from different channels] in a flexible, constantly changing pattern.
(Ayres, 1989, p11)

Ayres (1987) developed a theory that emphasised the necessity for integration of information from the tactile, proprioceptive and kinaesthetic senses. Michaels (2002) later identified children with dyslexia, dyspraxia or ADHD as being more likely to have dysfunctional sensory integration than other children.

Whilst this work does not relate to deafblind children I felt there may be some merit in considering the development of the proprioceptive, kinaesthetic and vestibular senses in deafblind children, exploring whether those children within whom these senses are underdeveloped lead to the child experiencing sensory integrating dysfunction.

This thought was reinforced when I was fortunate enough to work alongside David Brown (then Head of the Sense Family Centre in Ealing), and became involved with a young girl with CHARGE Association. It was felt that this child was experiencing difficulty developing her proprioceptive, kinaesthetic and vestibular senses and integrating the sensory information received. David suggested that we consider implementing a Sensory Integration Therapy programme. This proved to be quite a difficult challenge as it was necessary to obtain the advice and expertise of a physiotherapist or occupational therapist who had undergone specialist training in this field. Eventually such a specialist was located and an individual programme established with immediate positive effects.

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The success of this approach encouraged me to look further at the development of the proprioceptive, kinaesthetic and vestibular senses in deafblind children and to consider the possible impact on learning for the child experiencing difficulties in these areas.

Case studies

Joshua

I first met Joshua at home and the following observations were made during a three month period:

- Joshua had established a series of repetitive routes around the home and in the garden. Any physical change to the route (e.g. moving the position of a dining chair, placing a toy on the route) resulted in

Joshua stopping and turning back to begin the sequence of actions again and again until he was familiar with the alteration made and could then continue on his 'journey'. As a result of this behaviour he had been given a tentative diagnosis of autism;

- Joshua had a moderate hearing loss and wore two hearing aids. He was only able to walk when wearing the hearing aids and would revert to crawling when the hearing aids were removed;
- when crawling, Joshua was not able to use diagonally opposite limbs. In addition he crawled with his hands fisted and his feet held off the ground to reduce the amount of information received;
- Joshua was fixated by bright lights and mirrors;
- Joshua was very limited in his ability to actively explore his environment in other ways. He was only interested in one video that was played repeatedly at home. He would also hold a long thin piece of flex between one finger and thumb of his right hand.

Large movement games (e.g. swinging and jumping with an adult) were introduced that Joshua really enjoyed, and jumping became the one activity that Joshua would request by reaching up and taking the adult's hands (almost endlessly). After a term in school there was little change in his behaviour and only limited progress made.

The advice of a specialist physiotherapist was sought. Eventually the school paid for a private therapist to work with Joshua as those therapists already involved with children in school did not have the specialist training required. It was noted that Joshua was experiencing difficulty in a number of areas relating to his vestibular, proprioceptive and kinaesthetic senses.

An individual sensory integration programme was set up and implemented through eight sessions per week.

After six weeks many new skills were emerging, including:

- exploring playdough;
- beginning to mouth toys;
- more eye contact and social interaction;
- independent exploration of a range of toys;
- looking at his own reflection in a mirror;
- responding to object cues;
- simple problem solving (e.g. moving a book from his chair so that he could sit down).

Harry

Harry is a little boy with CHARGE Association. He has a profound hearing loss, glaucoma and is registered partially-sighted. He has a tracheotomy and on-going health problems. Consequently he has full-time nursing support in school.

Due to long periods of hospitalisation, Harry was not referred to the specialist teacher team for input regarding his sensory needs until he started school at the age of four.

Observations of Harry over time showed:

- he was reluctant to interact with others;
- the use of a Resonance Board was a huge breakthrough. Harry would become very excited and enjoyed experiencing strong vibrations. Use of this equipment supported the development of anticipation, turn-taking and cause and effect;
- Harry was not able to transfer these skills to other situations despite consistent and frequent exposure to similar activities presented in other environments;
- sign support was introduced together with other augmented communication modes (e.g. use of object cues). Harry began to respond to some everyday signs but made no attempt to imitate the signs himself;
- anti-social behaviours began to emerge, including scratching and pinching.

It was initially suggested by Harry's teacher that these behaviours were the result of naughtiness and attention seeking. This interpretation of Harry's behaviour was reviewed and the suggestion made that these behaviours (although socially unacceptable) were Harry's attempts to obtain information from his world. This view was supported by observing that Harry pinched toys and objects given to him, and not just people.

Physical joint compression work was introduced under the guidance of an occupational therapist (specialising in sensory integration work) and after the second session Harry began to initiate these activities himself. When these activities were undertaken Harry's pinching and scratching noticeably reduced for a period of time afterwards. He was also felt to be much happier, smiling and willing to interact with others. At the end of the second session Harry imitated waving 'goodbye', a behaviour not previously observed. A more detailed

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sensory integration programme is now being set up in conjunction with the occupational therapist.

Sarah

Sarah is a little girl who sustained brain injuries in an accident. She is now cortically blind and has a moderate hearing loss. Sarah is often distressed when handled and happiest when left to lie on the floor. Very few independent body movements occur.

Gentle movement activities were undertaken to assess the use of her vestibular sense. Sideways movements were consistently tolerated, but Sarah quickly became distressed each time backwards and forwards movements were introduced. This led to the question of how best to pick Sarah up or put her down so that she did not become distressed. It was agreed that:

- Sarah would be rolled onto one side and then lifted up in a sideways movement;
- Sarah would be put down in a sideways movement onto her side and then rolled onto her back or tummy.

This was implemented consistently by all those involved with Sarah and there was an almost immediate improvement in Sarah's ability to tolerate being handled. This led to her parents being able to position her for other activities without Sarah becoming distressed.

With physiotherapy input, a sensory integration programme was set up which used a large physiotherapy ball, working on:

- experiencing different positions;
- taking weight and pushing through her legs;
- experiencing large rocking movements;
- stop/start activities.

This programme was implemented consistently and after a period of approximately six weeks Sarah began to use her legs more intentionally. A black and white Be-Active Box was introduced and Sarah became able to happily spend up to twenty minutes in this environment, using her legs to activate sound-making objects suspended from the ceiling of the Box. Use of intentional leg movement increased and was used to develop simple cause and effect games. It has now resulted in Sarah undertaking simple switching work using her feet to activate the switch.

Conclusion

These and other children have shown me that children who may need support in this area may exhibit any or all of the following:

- over-stimulation, so that they appear tactile sensitive or tactile defensive;
- under-stimulation, so that they seek sensory information through intense actions (e.g. violent swinging, rocking, scratching, pinching);
- attempts to gain information from, and make sense of the world through repetitive actions and behaviours;
- difficulties crossing the mid-line with their limbs;
- problems with their vestibular sense;
- difficulty with balance and poor saving reflexes;
- if crawling, the inability to use diagonally opposite limbs simultaneously;
- problems organising their movements and actions;
- difficulty engaging in constructive exploration of the world.

I feel there is a need to focus attention on these areas of sensory development. These children have taught me that until they are:

- aware of their whole body and their body parts in relation to each other;
- aware of their position in space (including which is the right way up);
- able to organise their bodies to complete large movements;

they are unlikely to be able to effectively use their body to interact with or act upon their environment and learn.

I now recognise even more the importance of identifying those children who experience major sensory dysfunction and need support to encourage the development and integration of these underlying senses.

It appears that until these senses are established these children find it difficult to effectively integrate the sensory information gained from all other sensory channels and respond positively to it.

References

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Gail Deuce has recently joined Sense from a senior advisory role in schools.