

# Sensory Integration and Autistic Spectrum Disorder

## What is the evidence?



Sue Allen, Advanced Clinical Specialist Occupational Therapist, Dingley Specialist Children's Centre, Reading  
Sue Delpont, MSc (OT), Lecturer in Occupational Therapy, Cardiff University

### 1 Introduction

Occupational Therapists are concerned with the ability to perform everyday living skills. Poor sensory processing can influence skills that support performance, engagement and attention, as well as skills that enable the learning of new motor skills (Cosby, 2010, Jasmin, 2009).

These may include skills needed for tasks such as tooth brushing, eating, tolerating clothes, learning to dress, learning to swim, pedalling a bike, sitting in class, and coping with a supermarket.

To utilize scarce resources effectively we need to understand the evidence base.

### 3 What sensory integration difficulties are associated with autistic spectrum disorders (ASD)?

#### Sensory Modulation Difficulties-

a response to sensory stimuli that is consistently greater or less than that of most individuals

#### Praxis Difficulties -

difficulty planning and sequencing movement, particularly those that are new or novel.

#### What patterns of difficulty do we see

Can include:

- Difficulty registering important sensory input
  - extreme sensitivity
  - lack of responsiveness
- Difficulty attending to important sensory input
- Inability to cope with sudden or intense sensations
- Variability in reaction to sensation
- Gravitational Insecurities

May be observed in behaviours:

#### Sensory over responsiveness

- taste and smell responsivity associated with ASD
- Tactile/ Auditory/ Visual sensitivity/ defensiveness
- Aversive response to movement
- Gravitational Insecurities
- Sensory avoiding behaviours

#### Sensory under responsiveness

- observed more in children with just sensory modulation difficulties and less in those with ASD
- particularly noted in vestibular and proprioceptive systems
- Sensory seeking for movement, sound, vision, touch, smell or taste
  - Self-stimulatory behaviour
- Problems in processing touch information

This can result in:

- avoidance of activities/tasks
- attention difficulties
- failure to engage
- aggression
- self-harm
- auditory processing problems

Impacting on everyday life and function:

- social interaction
- being in groups
- oral hygiene eg tooth brushing
- clothing choice and dressing
- listening

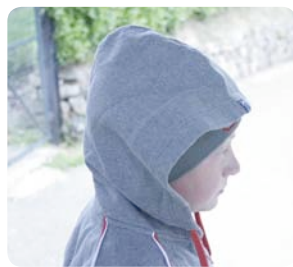
Can result in :

- gross movement ability
- poor ball skills
- reduced ability to use hands for:
  - fine motor activity
  - writing
  - dressing
- difficulty developing everyday living skills:
  - organizing and sequencing
  - grading
  - tool use eg pencil, scissors
  - self help skills eg making a sandwich
  - joining in team sports
- limited ideas for play
- disorganised behaviour
- poor imitation especially of mouth and facial gestures

#### Praxis



#### Modulation



#### However in ASD we do observe strengths in visual memory or visual manipulation of objects

60 to 70 % of children with ASD present with Sensory Modulation Disorder (Adamson 2006)

Children with ASD demonstrate low scores on all tests of praxis compared to typically developing children

Bundy 2002, Miller 2007 and Schaaf 2006

(Parham 2000)

### 2 What is sensory integration?

'the neurological process that organizes sensation from one's own body and the environment and makes it possible to use the body effectively within the environment' (Ayres, 1972)

### 4 What does sensory integration theory translate into intervention - what does it look like in practice?

- Individual treatment
- Consultation
- General Programmes

#### Individual Treatment - Sensory Integration Therapy

Requires an Occupational Therapist, Physiotherapist or Speech and Language Therapist with postgraduate training in Sensory Integration.

The International Coalition for Excellence in Sensory Integration recommends 120 hours of postgraduate training.

Individual Intervention aims to:

- Help to organize behaviour
- Improve feedback about the body
- Help the child attach meaning to sensation
- Provide a foundation for praxis / motor planning
- Encourage rapport and social interaction
- Incorporate sensory needs into daily routine

Changes have been demonstrated to be sustained, successful outcomes include improved:

- sensorimotor skills
- motor planning
- socialization,
- attention and behavioral regulation
- reading and reading related skills

and decreased autistic mannerisms (May-Benson 2010, Pfeiffer 2011)

#### Consultation - by a trained therapist

May include:

- Assessment to identify sensory processing concerns
- Parent or staff education to reframe behaviours or motor difficulties
- Development of new strategies

#### General Programmes - off the shelf programme, available to all

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)

### 5 References

- Adamson A, O'Hare A and Graham C. (2006) Impairments in Sensory Modulation in Children with Autistic Spectrum Disorder. BJOT 69(8)357-364.
- Bundy EA, Lane SJ, Murray EA, (2002) Sensory Integration: Theory and Intervention FA Davis.
- Ben-Sasson A et al(2008) A Meta-analysis of Sensory Modulation Symptoms in Individuals with Autism Spectrum Disorders. Journal of Autism and Developmental Disorders 39(1)1-11.
- Cosby and Johnston SS (2010) Sensory Processing Disorders and Social Participation AJOT May/June 2010 64(3) 462-473.
- Jasmin et al (2009) Sensori-motor and daily living skills of preschool children with autistic spectrum disorder. Journal of Autism and Developmental Disorders 39/2(231-241).
- Parham D and Ecker C. (2007). Sensory processing Measure- Home. Los Angeles: WPS.
- Lane SJ and Schaaf (2010). Examining the neuroscience evidence for sensory-driven neuroplasticity: Implications for sensory-based occupational therapy for children and adolescents. AJOT 64, 375-390.
- Miller L(2007) Concept Evolution in Sensory Integration: A Proposed Nosophology AJOT 62/2(135-140).
- May-Benson T (2010) Systematic Review of the Research Evidence Examining the Effectiveness of Interventions Using a Sensory Integration Approach for Children AJOT 61(2) 161-169.
- Miller L et al (2007) Lessons Learnt: A pilot study on Occupational Therapy effectiveness for children with Sensory Modulation Disorders.
- Miller et al(2007) Concept Evolution In Sensory Integration: A Proposed Nosophology for Diagnosis AJOT 62 (2) p135-140.
- Pfeiffer BA et al (2011). Research Scholars Initiative— Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. AJOT 65, 76-85.
- Schaaf R and Davies PL (2010) The Evolution of Sensory Integration Frame of Reference. AJOT 64(3) 363-367.
- Smith SA et al(2005) Effects of Sensory Integration on Self-stimulating and Self-Injurious Behaviours. AJOT 59(4).
- Smith Roley S, Blanche EI, and Schaaf R (2001) Understanding the nature of Sensory Integration with Diverse Populations. Therapy Skill Builders. Harcourt Health sciences.
- Watling R and Deitz J (1999) Current practice of occupational therapy for children with autism. AJOT 53(5):498-505.

Contact details:

Sue Allen  
[sue.allen@sensoryintegration.org.uk](mailto:sue.allen@sensoryintegration.org.uk)  
Sue Delpont  
[sue.delpont@sensoryintegration.org.uk](mailto:sue.delpont@sensoryintegration.org.uk)

