

Sensory issues in the Montessori classroom

Wendy Fidler gives us insights into the amazing web of sensory integration.

More than 80% of our nervous system activity involves processing and organising sensory information. Some children with central nervous system dysfunction have undamaged areas of their brains 'waiting' to be stimulated through a sensory integrative approach. These children can benefit greatly from occupational therapy, and there is much we can do ourselves as practitioners in the Montessori class.

"Sensory Integration can be defined as the ability of the central nervous system to organise and process input from different sensory channels to make an adaptive response. **Ayres, 1979.**"

We collect sensory information from our environment using the 'receptors' found in our special sense organs, such as the retinas in our eyes, the taste buds in our tongues and the cochleas in our ears. We also have internal receptors in our muscles and joints. Each receptor is attuned to a particular stimulus, for example a wavelength of light or a vibration of sound, which causes it to fire when excited.

What causes Sensory Issues?

For example: we hear a noise, we recall what the noise is and what it means, and we respond accordingly.

Sensory issues arise when the information we receive fails to be processed in the normal way. This might be because of too much or too little stimulation of the senses, or a failure to



Pictured left to right:
1. What do you notice about this child's back and his tripod arm position?
2. Poor muscle tone impacts on this child's ability to sit without propping himself up.
3. Boys often perform better out of doors.
4. What do you notice about this child's pencil grip?
5. This child has made his arm into a prop between his leg and head. Why?



Students at Origins School, Orlando, Florida balancing on rocker boards – balancing activities enhance vestibular development.

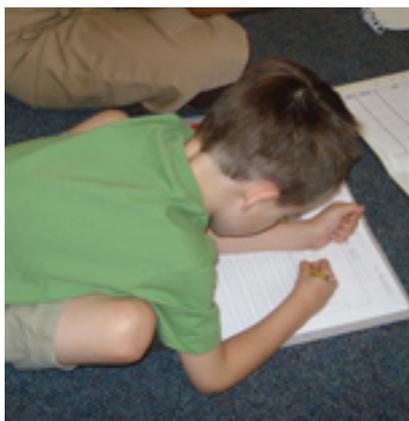
Sensory Processing is the ability to take in, sort out, process and make use of the sensory information received from the environment.

For example: we hear a noise, we recall what the noise is and what it means, and we respond accordingly.

When we process sensory information effectively we make a prompt and appropriate adaptive response to meet the demands made of us by the environment.

process or integrate the different sensory perceptions coming our way. Many children with learning

difficulties and disabilities (LDD) have sensory issues arising from malfunctions in sensory processing.



The Seven Senses

Dr Maria Montessori designed sensorial materials to help children isolate and develop the five senses of sight, sound, smell, taste and touch. For example, there are:

- sound boxes and bells to develop the auditory sense (sound)
- smelling bottles and food preparation for the olfactory sense (smell)
- activities to match sweet, sour, salt and bitter, the gustatory sense (taste)
- colour, shape, size and form activities to develop the visual sense (sight).
- rough and smooth boards to develop the tactile sense (touch)

In addition to the active touching we do with our hands and fingers, the skin covering our bodies registers basic sensations, such as touch, pressure, pain and temperature. It is what separates us from the rest of the world, giving us body boundaries that help us tell 'me' from 'not me'.

Some touch, like a hug, massage or back rub feels calm and comforting. Other touch is irritating or alerting like a tickle or strand of spider's web across the skin.

Dr Montessori designed other sensorial materials so that children could combine and integrate vestibular (balance) and proprioceptive (body awareness) stimuli.

The Vestibular Sense:

controls our sense of balance and plays a vital part in:

- information about the position and acceleration of our head and body and how it is moving in relation to gravity
- ocular movements (e.g. peripheral vision – what we can see at the edges of our vision whilst looking straight ahead)



PHOTOS COURTESY OF EAGLE PEAK MONTESSORI

Climbing trees is great for developing vestibular and proprioceptive sense.

Children with poor vestibular processing often have deficiencies in posture and in the movement patterns that stable posture supports.

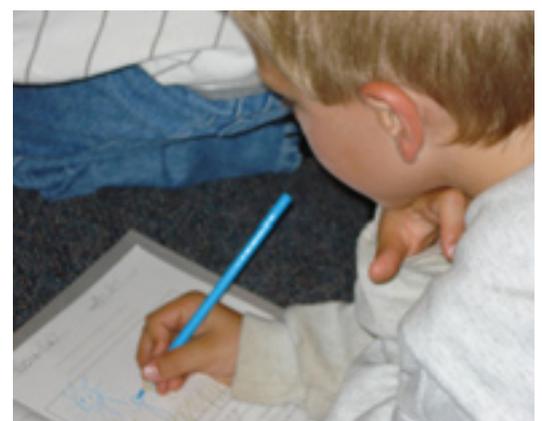
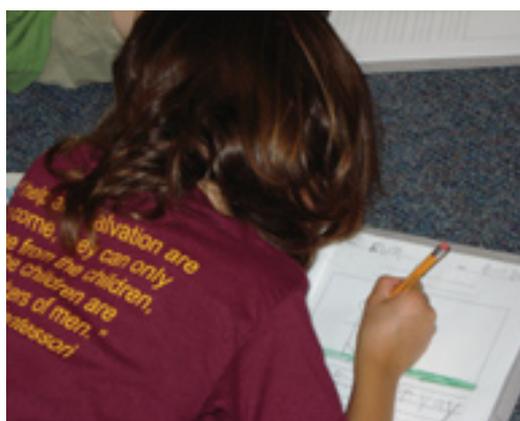
The vestibular system has connections to most areas of the central nervous system; these enable us to respond with bi-lateral (both sides of the body) changes in balance and posture, make eye movements which compensate for head movement, and experience a range of sensations in response to movement. Children with poor vestibular processing often have deficiencies in posture and in the movement patterns that stable posture supports.

Balancing activities such as walking on the line, bouncing, sliding, spinning, swinging, dancing and

moving the head in all three planes – vertically, horizontally and diagonally all enhance vestibular development. Throwing and catching involve coordination of head, eye and hand, and of jumping and diving movements. Working and playing out of doors generally provides more vestibular stimulation than being indoors.

All the Montessori sensorial materials work for the vestibular sense; by the very nature of moving and looking towards the material, picking it up, turning, walking to the chosen place of work and moving the eyes and the head side to side and up and down in accordance with the demands of the activity. Working with the material on a floor mat involves good downward head movements.

Babies who miss out on pushing up from a tummy down position, who do not creep (commando crawl on elbows) or crawl on all fours often have undeveloped vestibular systems. >>



The Proprioceptive Sense: proprioceptive receptors in our muscles and joints provide us with:

- information about where our body parts are
- motor development and coordination
- the means to control our movements without looking

The proprioceptors lie primarily along muscle fibres and in the tendons and ligaments that connect muscle to bone. The more muscles contract or elongate and the more joints are compressed, stretched or jarred, the stronger the sensory input. The proprioceptive system supports three main sensorimotor functions: muscle tone, body image and control of effort.

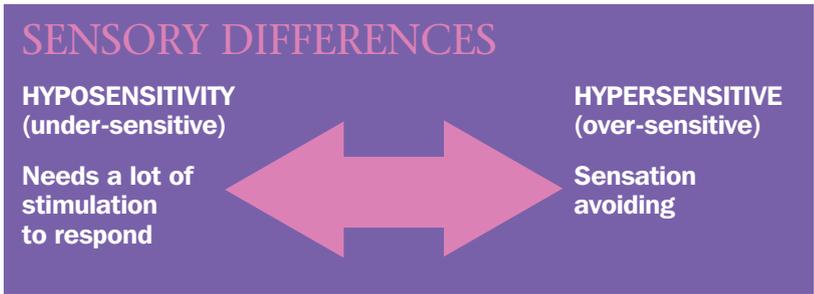
These three functions provide the foundation for learning motor patterns which become skilled movements or coordination. Conversely, children with proprioceptive dysfunction often have clumsy and poorly coordinated movements.

Children develop good proprioceptive sense through ‘grazing’ movements which teach them by very small gradations, how hard to press. So, for example, when children pick up the largest cube in the pink tower, they learn to press harder in order to hold the cube steady than when they pick up and carry the consecutively smaller cubes. It’s the same with the broad stair, long rods etc.

Very small children who miss out on heavy work, such as pulling out and sorting pots and pans from low cupboards, pushing and pulling carts of bricks, rough and tumble, climbing trees and pedalling uphill often have proprioceptive issues. Scrubbing tables, polishing brass and cleaning shoes are favourite repetitive activities in Montessori schools but there is much to be gained by adding activities which cause children to use their muscles more, such as woodwork, bread making and gardening. ■

Bibliography:

Ayres, A.J. (1979), *Sensory Integration and The Child*
 Berger, D.S. (2002), *Music Therapy, Sensory Integration and the Autistic Child*. Jessica Kingsley, London
 Goddard-Blythe, S. (2007), *The Well Balanced Child: Movement and Early*



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Learning, Hawthorne Press, Stroud, Gloucestershire

Grandin, T. (2005), *Emergence: Labeled Autistic – A True Story*, Warner Books, New York

Kurtz, L.A. (2003), *How to Help a Clumsy Child – Strategies for Young Children with Developmental Motor Concerns*, Jessica Kingsley, London

Resources:

www.balameetrics.com : balance boards, bean bags

www.amazon.com : wobble boards

<http://www.nintendo.com/wii> : wii balance boards

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Wendy Fidler is an independent Montessori education consultant. She leads courses on learning differences and disabilities (LDD) and special educational needs (SEN) throughout the world.

Right: The Wii Balance Board attached to a Wii Fit demo at the Leipzig Games Convention in August of 2007.



Left: Balance board

Top Sensory Tips for the Montessori Classroom:

- avoid or fit diffusers to fluorescent strip lights which distract children by flickering many times per second
- avoid high ceilings, large spaces and hard floorings which contribute to echoes and tinny sounds (in low stimulation environments children’s noise making behaviours diminish markedly)
- adopt a non-perfumed body products rule
- avoid detergent/fabric conditioner overload (smell and sensitivity issues)
- consult with parents about foods, fabrics and other materials to avoid
- use divided plates to separate foods with different textures
- consult with parents to prepare for change, e.g. trips from or visitors to the class
- provide ice-cold wet wipes (keep in the fridge) for the toilets for better sensory feedback
- keep walls clear of displays and the wall coverings light and uncluttered
- provide coping strategies such as regular movement breaks
- provide squidgy or beany fidgets for children to squeeze
- allow heavy jackets, or pockets with weights – they can have a calming effect
- encourage all children to read, knit or sew while standing on balance boards
- plan daily catching and throwing activities using graded weight bean bags and balls for all children