Sensory Integration
The Building Blocks for Development

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Children’s Therapy Works

What is sensory integration?

“What sensory integration is 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, 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.”

Ayres, 1989

Why is this important?
The ability to process sensory information is critical to a person’s ability to function, complete activities of daily living, interact with others, work and play.
What are the power systems?

Vestibular System

- The vestibular system is a precise internal guidance instrument for maintaining orientation of the head and body in gravity bound space.

Vestibular Habilitation From the Core

Receptors in inner ear: semicircular canals, utricle, saccule, cochlea

Listening with the Whole Body, Frick, Hacker 2001
Gravity and Movement Challenged, Cool, Richter, 2007

**Why is this important?**

- Tells the brain about motion, pull of gravity and where “down” is.
- Key to developing laterality, spatial awareness, eye movement skills and sense of directionality.
- Exerts strong influence over muscle tone and postural control.

**Tactile system**

- Light touch and pressure receptors fire with light and pressure touch/contact.
- Information about temperature, pain and vibration through skin contact/receptors.
Why is this important?

- Helps develop sense of physical boundary and body scheme.
- Important to development of motor and perceptual skills.

**Proprioceptive system**

- Sensation comes from receptors that are located in muscles, tendons, ligaments and joints.
Why is this important?

- Provide information about body position, movement and body scheme.
- Important to body awareness and sense of “me”.

What are some of the typical forms of sensory integrative dysfunction?
Sensory Defensiveness

- Responding to harmless or neutral sensation as though it were painful or threatening. One, two or several sensory systems may be affected. May range from mild to severe.

Tactile Defensiveness

- Dislike tags in shirts, underwear or pants
- Dislike seams in socks
- Dislike cuffs and turtlenecks
- Won’t wear jeans, sweaters or certain fabrics
- Withdraws, avoids or pulls away from touch
- Dislike cutting hair, finger and toe nails
- Won’t dry off with towels after bathing

Auditory Defensiveness

- Covers ears with sounds
- Dislikes the sound of the vacuum
- Asks to turn the television down
- Distracted with background noises
- Short attention span/concentration level
- Poor comprehension level

Olfactory Defensiveness

- Dislikes the smell of perfume, deodorant or lotion
- Easily smells odors
- Smell things earlier than others normally do
Visual Defensiveness

- Dislikes bright lights and sunlight
- Covers eyes when traveling in a car
- Oncoming traffic lights are too bright
- Squints frequently
- Has difficulty finding objects in a cluttered area

Oral Defensiveness

- Dislikes food textures: meat, mashed potatoes, raw or cooked vegetables, noodles with sauce or meat and sauce, hotdishes, mushy/grainy fruits, etc.
- Dislikes brushing teeth or flavor of toothpaste
- Gags easily

Vestibular Defensiveness

- Gets dizzy easily
- Gets carsick
- Will not go on rides at valleyfair or county fairs
- Dislikes spinning or moving rapidly
- Gravitational insecurity

What can defensiveness do to social interaction?

Individuals may have patterns of avoidance, fear, anxiety, sensory seeking or even aggression.

Social emotional disorders related to sensory defensiveness result in habits and interaction styles that are protective and defensive in nature. These stress and anxiety reactions can appear as obsessive and compulsive or even controlling behaviors.

Wilbarger
Arousal Level

- Problems of threshold and intensity of input.
- May be hypo-reactive or hyper-responsive to sensory stimuli.

Tactile Under Arousal

- Does not feel touch
- Poor gradation of touch, touches objects with an excessive amount of force
- Does not feel when clothing is not on properly
- Touches objects in the environment frequently
- Unaware of boundaries, invades others personal space

Auditory Under Arousal

- Makes constant or excessive noise
- Talks loudly
- Turns up the television or music
- Appears to tune people out
- Does not respond when name is called

Visual Under Arousal

- Attracted to bright lights: lava lamps, etc
- Attracted to distinctive patterns
- Wears bright colors and clothing with multiple colors
Olfactory Under Arousal

- Smells objects frequently, for example, candles, lotions, perfumes
- Wears excessive amounts of perfume or cologne

Oral Under Arousal

- Eats an excessive amount of food and does not get full, often times ends in vomiting
- Pockets food
- Chokes on food because does not feel the amount in the oral cavity
- Drools excessively
- Play with fingers and toys in their mouths

Vestibular Under Arousal

- Spins and spins and does not get dizzy
- Loves rides at valleyfair or county fair
- Engage in constant movement
- Fidgets frequently
- Rocks back and forth during activities
- Hangs upside down

Modulation

- A person may have difficulty maintaining or achieving a calm alert state.
- Lucy Miller reports that sensory modulation refers to both physiologic and behavioral responses.
Why is this important?

- This is the volume control in our nervous system!
- Individuals with modulation issues cannot adapt their arousal level to changing environments or transition between environments effectively.

Modulation Dysfunction

- Trouble with transitions
- Sleep/wake cycles
- Low frustration tolerance, gets upset for “no reason”
- Poor recovery time
- Problems with regulating activity level
- Inability to go with the flow

Integration of multiple systems

Multiple system dysfunction

- Delayed gross and fine motor skills
- Poor bilateral integration, motor planning, trunk strength and stability, etc
- Poor social engagement
- Poor academics
- Behavioral issues
- Mental health issues
RESOURCES:

Books:
- The Out of Sync Child: Carol Kranowitz
- The Out of Sync Child has Fun: Carol Kranowitz
- Too Loud Too Bright Too Fast Too Tight: Sharon Heller
- Sensational Children: L. J. Miller
- Freaks, Geeks and Aspergers Syndrome: Luke Jackson
- 101 Activities for Kids in Tight Spaces: Carol Kranowitz
- The Goodenoughs get in Sync: Carol Kranowitz
- Animals in Translation: Temple Grandin
- Thinking in Pictures: Temple Grandin