THE INFLUENCE OF SENSORY PROCESSING ON BEHAVIOR AND LEARNING

Presented by Jennifer Rosinia, PhD, OTR/L For: EIPT CFC Conference
Kid Links Unlimited, Inc. kidlinksinc@usa.net

1

Gather and Settle

(A "Jenniferism")

What does it take for you to be available for relationships and learning?

Specifically, what sensory supports do you need?

If it's true for you, it's even more true for the children!

2

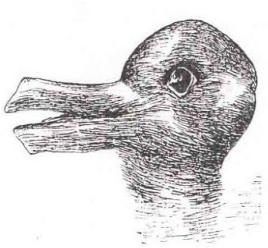
All Behavior has Meaning

It's our job to figure it out!

3

Our Job is Not to Simplify…..

Our Job is to Embrace Complexity!



4

The Theory of Sensory Integration

- It all began with A. Jean Ayres
- Hypothesized to be a normal function of the nervous system
- Theory addresses two related issues:
- It has always been a controversial theory!

5

Definition:

Sensory Integration is 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

6

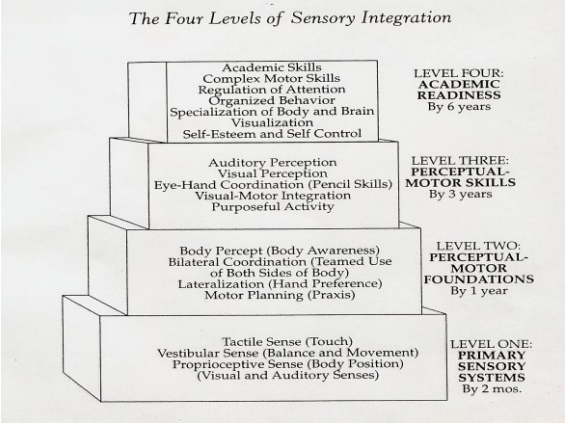
There are (actually) 8 sensory systems

The Basic 5: Vision, Hearing, Taste, Smell, and Touch

The "Lesser Known" or "Hidden" Senses:
Vestibular and Proprioception

Interoception Sense: includes input regarding: heart rate, thirst, hunger, digestion, state of arousal, mood, temperature, respiration, bowel and bladder.

7

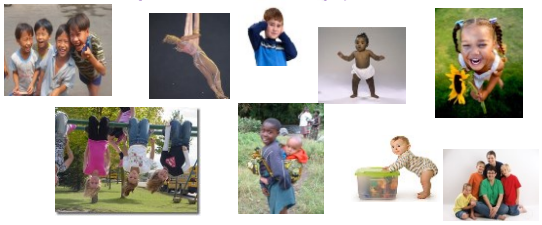


8

Sensory Processing

The way the nervous system receives sensory messages and turns them into responses.

Everyone is a sensory processor!



9

The Most Salient of the Sensory Systems: The Tactile System

*First sensory system to develop in utero and is the most mature sensory system at birth

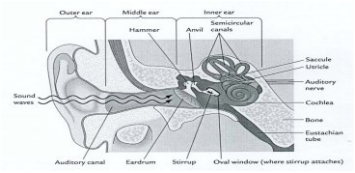
*Largest receptor organ in the body

*Serves two functions:
- Protection
- Discrimination

10

The Vestibular System

- The Vestibular system is made up of three small bones in the inner ear. The semicircular canal, the saccule, and the utricle. The semicircular canals register speed, force, and direction of head rotation. The other two are sensitive to the force of gravity and linear movement.



11

Vestibular Contributions to Development and Learning

- Balance
- Muscle Tone
- Coordination
- Controlling Eye Movements
- Arousal States
- Attention Levels
- Emotional States

12

Proprioceptive Contributions to Development and Learning

- Orientation Of Body In Space
- Timing Movement
- Plan, Organize And Remember Movements
- Modify Force Exerted By Muscles
- Develop A Body Scheme

13

Interrelated Components of Sensory Processing

1. Sensory registration
2. Orientation '
3. Interpretation
4. Organization of a response
5. Execution of a response

14

Sensory/Neurological Thresholds

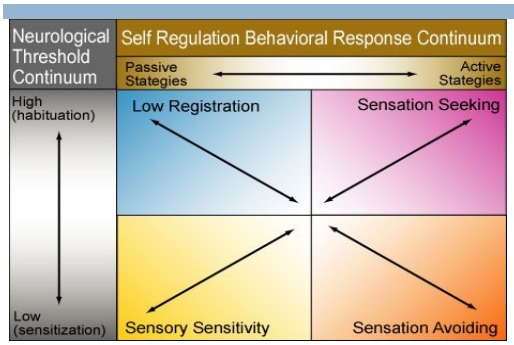
When the nervous system responds really quickly to a sensory stimulus, we say there is a *low threshold*.

And when the nervous system responds more slowly than expected, we say there is a *high threshold* for responding.

15

Neurological Thresholds Continuum

(Winnie Dunn,1997)



16

Common Behaviors According to Sensory/Neurological Thresholds

High/Passive:
"By-standers" don't know what they are missing. They are easy going and can focus even with distractions.

High/Active:
"Seekers" always want more. They create excitement &change all around them

Low/Passive:
"Sensors" keep track of everything. They notice what is going on & have precise ideas about how to handle situations

Low/Active:
"Avoiders" want more of the same thing and nothing more. They create routines to keep life peaceful & manageable

17

Sensory Modulation Disorder

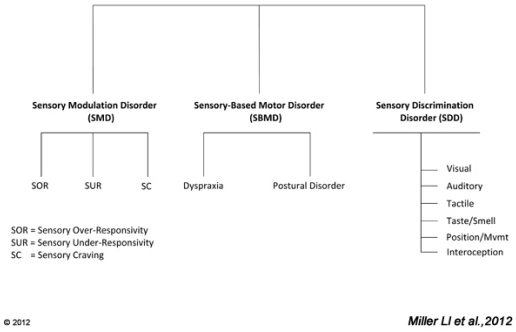
Difficulty regulating responses to sensory input – responses are not adjusted to the situation

Difficulty achieving and maintaining an optimal level or arousal and adapting to the challenges in every day life

TO BE LABLED A "DISORDER" THE SENSORY DIFFICULTIES MUST BE SEVERE ENOUGH TO DISRUPT THE ABILITY TO ADAPT TO DAILY LIFE CHALLENGES

18

Sensory Processing Disorder (SPD)



Miller LJ et al.,2012

19

SENSORY OVER-RESPONSIVITY

- Responds too much, too frequently, or for too long
- Aggressive or impulsively when overwhelmed
- Irritable, fussy, moody
- Unsociable; avoids group activities and has trouble forming relationships
- Excessively cautious and afraid to try new things
- Upset by transitions and unexpected changes
- Anxious or withdrawn

20

Sensory Under Responsive

- Poor inner drive, uninterested in exploring the world around
- Passive, quite, withdrawn
- Difficult to engage in conversation or other social interaction
- Easily lost in own fantasy world
- Apathetic and easily exhausted
- Excessively slow to respond to directions or complete assignments

21

Sensory Craving

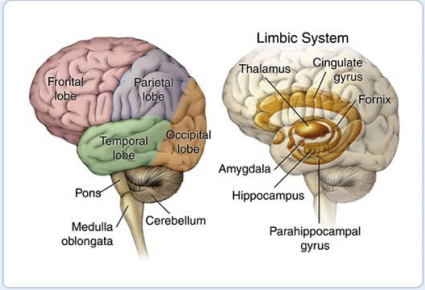
("note not "Seeking")

Wants much more sensory stimuli than most people
BUT becomes ***MORE DISORGANIZED*** when receives it….

- Constantly wants control over every situation
- In your face and in your space
- Does not wait turn, interrupts constantly
- Angry or even explosive when required to sit still or stop whatever he is doing – intense, hard to calm, demanding, disruptive
- Creates situations that others would consider bad or dangerous
- Excessively physically affectionate
- Discharged from schools due to behavior

22

Neuroscience Foundations



23

Emotions are a function of the nervous system. Emotions are so powerful they can override rational thinking and innate brain stem patterns!

24

Research on the biology of stress responding shows that chronic, severe, and/or uncontrollable stressful experiences disrupt developing brain architecture and can lead to stress management systems that respond at lower thresholds

25

Goal: Self Regulation in the service of Enjoying Life!

- Sensory input can be calming or alerting
- Children can learn to use sensorimotor strategies to organize
- Strategies are modified according to individual response

26

Using a Sensory Processing Approach to Teaching – General Guidelines

- DON'T JUST DO SOMETHING STAND THERE!
  - Begin by Observing!
- Identify, Recognize and Read the Child's Cues
- Monitor Arousal and Attention Levels
- Use Sensory Strategies to Help Calm or to Help Arouse
- Modify Relationships between the Child, Environment & Others
- Provide the Just Right Challenge
- Look for Adaptive Responses to Indicate You're on the Right Track
- Gradually Increase Complexity

27

SENSORY SYSTEM	TO CALM	TO ALERT
Tactile	• Deep pressure touch • Swaddling • Rhythmic patting/stroking (massage) • Hugs (holding firmly) • Taking a bath	• Light touch (especially face, palms, and stomach) • Touch that involves movement • Taking a shower
Vestibular	• Rhythmic movement • Slow rocking • Maintaining head or body position • Sustained movement	• Non-rhythmic movement • Jiggle, bounce, or jump • Rotary movement • Upright positioning
Proprioceptive	• Resistive activities • Rhythmic motor activities	• Resistive activities • Changeable motor activities
Visual	• Muted, soft, or natural colors • Room dividers • Steady consistent input	• Bright colors and lights • Moving objects towards face • Focused lighting on objects • Moving objects at irregular speeds
Auditory	• White noises • Low-key humming • Monotone speaking or singing • Use of slow rhythms	• Vary intensity, pitch, or beat • Loud music
Gustatory/Oral	• Sucking • Use of mild flavors • Consistent temperature and texture of food and liquids • Sustained blowing activities	• Citrus, salty, or sour flavors • Cold liquids • Frozen treats • Vary temperature and texture of food • Chew before or during focused tasks

28

Sensory Strategies




29

Prevalence Of SPD

- Two studies show that at least 1 in 20 children's daily lives is affected by SPD. (Ahn, Miller, Milberger, McIntosh, 2004; Carter, 2011)
- A research study by the Sensory Processing Disorder Scientific Work Group suggests that 1 in every 6 children experiences sensory symptoms that may be significant enough to affect aspects of everyday life functions. (Ben-Sasson, Carter, Briggs-Gowen, 2009)
- In a review of literature looking at SPD in premis, now at ages birth-3yrs.: 46% showed evidence of SPD. (Mitchell, A.W., 2015)

30

It's All About Relationships!!
(Another Jenniferism)

- Relationship to our physical body
- Relationship to our environment
- Relationship to others

Life is a Sensory Experience!

31

If you do what you've always done, you'll get what you've always gotten. So, if you'd like to get something that you've never gotten before, perhaps you'll have to do something that you've never done before.

Adapted from Mark Twain

32