Sensory Processing in Children with Autism

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The Sensational Story of Sensory Processing and Behavior

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Making Sense of the Sensory Story in five parts

- Our 5 senses; and just a couple more …
- Sensory Integration
- Sensory Processing Disorder
- Sensory Screening, Assessment and Evaluation
- Sensory Interventions
Sensory Differences

Sensory processing is a person's way of noticing and responding to sensory events in everyday life. We all perceive sensory information differently. However, our students experience sensory differences to a greater degree.

Students with impaired sensory systems (sensory processing disorders) who you may encounter at various sites include students with Attention Deficit Hyperactivity Disorder, Fetal Alcohol Spectrum Disorder, Intellectual Disability, Dyspraxia/Communication Disorders, Learning Disabilities, Emotional Disturbance, Autism Spectrum Disorders, and Aspergers.

Sensory processing disorders may manifest into challenging behaviors in the classroom, which are commonly mistaken for non-compliance, attention seeking, or escaping/avoiding a task. Many maladaptive behaviors (hitting, biting, screaming, slamming body against hard surfaces, self-injurious behaviors) exhibited by students, particularly those with ASD serve the purpose of regulating their internal sensory processing systems.

Sensory Spectrum

Seekers: Less sensitive/Active, seeking reflects high thresholds that need to be met through the surrounding environment. Seekers make noise, edge, touch, fidget, hang on others, and taste things.

Low Registration (Under responders): Less sensitive/Passive, do not notice what is going on around them, may seem bored, dull, uninterested, difficult to engage, easily exhausted, appear apathetic.

Sensitivity (Over responders): Very sensitive/Active, notice more things than their peers easily upset, seem hyperactive, distracted, difficulty learning from experiences because their routine is often interrupted.

Avoiding: Very sensitive/Passive, actively try to prevent sensory input, experience discomfort quickly, develop rituals control their sensory environment.

CENTRAL NERVOUS SYSTEM
Objectives
- Understand the two "hidden" movement senses: vestibular and proprioception
- Gain a basic understanding of the components of sensory integration
- Gain a basic understanding of Sensory Processing Disorder
- Identify signs of Sensory Processing Disorder
- Have a basic knowledge of Sensory Integration therapy and sensory interventions
Our 5 senses; and just a couple more ...

part one

Our 5 Senses

Visual
sight

Gustatory
taste

Olfactory
smell

Auditory
sound

Tactile
touch

+ 2 more

Vestibular
movement

Proprioception
body awareness
Vestibular
the movement sense
up, down, angular, circular, fast, slow

Vestibular System
movement sense

- body movement: helps us plan our actions
- speed and direction
- if we are moving or still
- if things around us are moving or still
- like auditory, responds to vibrations

Vestibular System
movement sense

- helps with vision by stabilizing the eyes when our heads and bodies are moving
- tracking
- focusing
Vestibular System
movement sense

- informs us of our relationship to gravity; if we are upright or upside down
- helps maintain our balance
- helps maintain posture and muscle tone -- the readiness of a muscle to work

circular & angular movement

spinning
Merry-go-round

up and down
back and forth
**Proprioception**
the sense of body awareness

- Joints
- Muscles
- Muscle spindles

**Heavy Work**
- Lifting
- Pulling
- Force
- Position

**Proprioception**
the sense of body awareness
- Unconsciously aware of our body
- Helps create body scheme or body map
- Tells us the relationship of our body parts to each other, to other people, and to objects
- Adjusts the amount of muscle force needed for the given situation
- Like the vestibular system, it responds to movement and gravity
Our 7 senses

Gustatory

Auditory

Visual

Tactile

Olfactory

Proprioception

Vestibular

The Theory of Sensory Integration

Dr. A. Jean Ayres, Ph.D., OTR

Dr. Ayres developed the theory in the 1950’s and 1960’s while practicing as an occupational therapist in a children’s center, and then while earning her doctoral degree.

Steps to Sensory Integration (SI)

1. Registration - become aware of sensory input
2. Orientation - brain decides how to pay attention to input through modulation
3. Interpretation - brain decides the quality of the input
4. Organization of a response - is a response necessary; physical, emotional, cognitive?
5. Execution of a response - an action results, physical, emotional, cognitive
Sensory Integration/Sensory Processing

The brain modulates and integrates the input and organizes a response.

Register sensory information through the nervous system.

Person responds with an action, an emotion or a behavior.

Outcomes of Sensory Integration

Sensory Modulation

- How the brain regulates the sensory input it receives and therefore regulates how we respond to sensory information.
- If information is too intense (loud concert) it is inhibited—or "turned down" in the brain.
- If information is too mild (quiet speaker) it is facilitated—or "turned up" in the brain.
Modulation/Volume Control

- too loud
  - turn it down
- not important
- too low
  - turn it up
  - important, needs more attention

Self Regulation

Self regulation in relation to sensory processing is the nervous system’s ability to attain, maintain and change levels of arousal or alertness appropriate to the task or situation.

(*“How Does Your Engine Run;” Williams and Shellenberger, 1994)

Self regulation allows us to:

- Attend to task
- Control impulses
- Tolerate frustration
- Regulate emotional reactions

Two Types of Responses to Sensory Input

Protective
- The “Uh Oh!” system
- alerts us
- fright, flight or fight
- reflexes

Discriminative
- The “Ah Ha…” system
- determines big and subtle differences in what we are experiencing

Neurotypical individuals with intact sensory processing have access to both systems; whereas individuals with sensory processing disorder respond in the protective mode most of the time.
Sensory Processing Disorder

What causes Sensory Processing Disorder?
- Not known for sure
- Atypical development of the nervous system
- Misfiring of information within the nervous system

How Does SPD Affect Behavior?

Problems with Motor Planning
- Poor coordination, inconsistent motor performance, hard to learn new skills
- Unsure of body position

Problems with Self Regulation
- Over-activated, high activity level, hyper-alertness
- Easily distracted
- Seeks sensory input
- Under-activated, low activity level, passive
- Avoids sensory input

Problems with Response to Input
- Flight, fright or fight at inappropriate times
- Unable to determine differences and sameness
Sensory Over-Responsiveness
- also called Sensory Defensiveness or hypersensitivity
- children respond more quickly, intensely and for a longer periods of time
- protective system kicks in easily – fright, flight or fight
- fussy, anxious, controlling, aggressive or withdrawn, picky, inflexible
- distress with certain sounds, sensitive to light, discomfort with certain textures, aversion to certain tastes and smells, irrational fear of heights and movement

Examples of Sensory Defensiveness
- Tactile Defensiveness: avoids touch from others; dislikes messy play; irritated by certain clothing texture and labels
- Gravitational Defensiveness: fear and dislike of movement and changes in body position; discomfort with changes in head positions; fear of having feet off the ground
Examples of Sensory Defensiveness

- **Auditory Defensiveness**: over-sensitivity to loud, unexpected or specific sounds; fearful of appliances such as vacuum cleaners, hair dryers

- **Oral Defensiveness**: combination of over-sensitivity to touch, smell and taste; dislikes certain food textures and types; difficulty with brushing teeth and face washing

Sensory Under-Responsiveness

- exhibit less of a response than the situation demands
- takes longer to react
- require intense and/or longer lasting sensory messages
- child may fail to notice or take longer to notice pain
- are often quiet, alone, prefer solitary play; appear self-contained
- this subtype is often undetected

Troy

- when he falls or bumps himself he doesn’t complain
- doesn’t seem to be bothered by loud or sudden sounds
- likes circle time best when there is music and singing
- responses are delayed

VERY QUIET PERSONALITY

sensory under responsive
Examples of Under Responsive

- decreased alertness and arousal level
- not as sensitive to changes in the environment
- slow working, playing, eating, dressing... pace
- seem indifferent to scolding or negative feedback
- decrease social engagement, withdrawn

Sensory Seeking

- actively seek sensation, appear to be impulsive
- bumping, crashing into the wall, thrill seekers
- crowd people and knock other children over without being aware of their actions
- can be demanding and even aggressive
- food is never too spicy, the TV or music is never too loud
- often get labeled as trouble makers

ACTION PACKED

- bumps into everybody and everything, all the time
- likes to spin, never gets dizzy
- will not sit down for lunch, takes a bite then gets up to do something else
- likes to touch everything
- can stay with an activity for at the most... a minute

Pamela
Reasons for Sensory Seeking

- under responsive to proprioception: child may seek out additional input to increase their body awareness and sense of security
- may not adequately register or modulate proprioceptive input
- may not adequately register or modulate vestibular input
- movement helps child stay alert and organized
- movement helps screen out uncomfortable sensations from other sensory systems

Evaluation of Sensory Integration

- Sensory History and Profile
- Screening and Checklists
- Assessments

Screenings and check lists
Guiding Principles of Sensory Integration Program

- Tailor the learning environment to fit a child’s sensory needs so they can better integrate sensations.
- Ensure that the child interacts with the environment so that development and learning occurs.
- Respond appropriately to a child’s sensory needs by interpreting the child’s behaviors which are motivated by their need to regulate their sensory systems.

Guiding Principles (continued)

- Provide choices to a child so that they can direct their own actions, feel empowered, and learn to independently regulate their sensory needs.
- Practice sensory interventions during play.
- Measure a child’s progress by his/her response to previously challenging situations.
- Collect data to track whether or not a sensory intervention is successful.

Some Ways Sensory Intervention Can Improve Learning

- Improve ability to attend; decrease distractibility.
- Improve alertness level.
- Self regulation of emotions and behavior.
- Decrease anxiety.
- Increase social interaction.
- Improve play skills.
Sensory Diet: an intervention for challenging behavior

- planned and scheduled activities provided throughout the day; designed to meet a child’s specific sensory needs
- “main course” – movement, deep pressure, heavy work
- “snacks” – oral motor, auditory, visual, smell experiences

*Handout

Calming Techniques

Main Course Menu
- Relaxing in a sleeping bag, blanket or under large pillows or mats
- Slow rocking in a rocking chair or on stomach in head-to-toe direction
- Lycra/Spandex clothing, body sock, or cocoon sensory swing
- Calming sequence

Snack Menu
- Sucking through a straw, hard candy
- Lavender, vanilla, banana smells (be careful)
- White noise or musical movement with a steady beat
- Reduce noise and light levels – eliminate fluorescents, add white holiday lights or natural light

Organizing Techniques

Main Course Menu
- Lifting heavy objects
- Hanging, pushing, pulling
- Swimming
- Rhythmic activity

Snack Menu
- Vibration – a toy, pillow, squiggly pen
- Chewing and blowing
- Wiggle cushions for seats
- Fidgets
Alerting Techniques

Main Course Menu
- quick unpredictable movement like a run, stop and go game
- fast swinging
- sitting/bouncing on a yoga ball
- hopping and jumping

Snack Menu
- bright lights
- strong odors
- cold water play
- loud, fast music
- strong tastes like citrus, cinnamon
- ice to eat

Solutions
- Become a detective
- Evaluate what child's behavior is actually saying
- Gradual exposure to sensory stimuli - a sensory diet
- Trust your senses for the child's needs and become an advocate

Recognize the effects on behavior of:
- Clothing Issues
- Tickling - overstimulation
- Environmental issues
  - Space
  - Lighting
  - Sounds
Sensory Diet

Tactile activities
- Self touch easiest then progress to touch from an object to touch from another

Vestibular stimulation
- Stimulation in all planes of head and body at varied speeds

Tips for helping kids with Sensory Issues

1. Change beliefs about the child
   - From won't do → can't do
   - Bad child → frustrated or challenged child
   - Refusing to sit still → over stimulated
   - Thief → does not understand ownership
   - Trying to get attention → needing contact
   - Fussy and demanding → oversensitive

Reducing overwhelming sights and sounds
- Maintain a calm and quiet environment
- Minimize the number & type of objects hanging from ceiling or walls
- Use calm colors such as pastel blue, light green or pale yellow.
- Avoid orange or bright red
- Protect the baby from too much bright light, noise, talking music
- Be aware of signs that the baby is over stimulated
- Protect the baby from being overwhelmed
Tips for helping kids with Sensory Issues, cont.

- External brain strategies
  - Concrete versus abstract
  - Multisensory learning opportunities
  - Structures and predictable daily routine
  - Calming techniques
  - Set up day for successes rather than failures
- Conducive, helping environment
  - Reduced stimulation
  - Design of classrooms
  - Simple routines
  - Clearly posted rules

Importance of recognizing sensory needs

- Improved ability to handle distractions
- Improved ability to pay attention
- Improved independence in functional activities
- Improved social interaction
- Improved communication
- Less need to stimulate or injure self
- Improved ability to handle change

Keys to successful interventions

1. Concrete
2. Consistency
3. Repetition
4. Routine
5. Simplicity
6. Specific
7. Structure
8. Supervision
Parental Strategies
- Concentrate on child’s strengths and talents
- Accept your child’s limitations
- Be consistent with everything
- Use stable routines that do not change daily
- Keep it simple
- Be specific - Say exactly what you mean
- Use visual aids, music, and hands on experience
- Repeat, Repeat, Repeat!

My Resources

The End