Autism and Deafness: Sensory Implications

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Introduction/Overview

- Identify the difference between the vestibular, proprioceptive, tactile processing
- Discuss 3 ways these sensory systems often affect an individual with autism and deafness
- Define joint attention and explain its importance in early identification of autism
- Learn to incorporate sensory and behavioral strategies into everyday routines for early intervention home visits
- Learn to incorporate sensory and behavioral strategies into everyday classroom management
Our many senses

- **Interoception**
  - From inside the body
- **Vestibular-Proprioception**
  - From the head and musculo-skeletal system
- **Exteroception**
  - From outside the body
- **Multisensory Processing**
  - How they all work together in context
Vestibular Sense

- Senses movement, balance, and gravity
- Detects position and movement of the head relative to gravity
- Receptors located in inner ear and connected to the cochlea for hearing
- Pivotal for anti-gravity postures
- Closely linked to visual system
  - Eye gaze
  - Rapid location of objects in space
  - Maintaining balance while visual field is moving
Vestibular System
Proprioceptive Sense

- Understanding where your body is in space
- “Muscle sense”: carries information about joint position and movement
- Vital for:
  - Motor planning
  - Exhibiting motor control
  - Grading pressure for a given movement
  - Postural stability
What is Sensory Processing?

- Jane Ayres defines Sensory Processing (SP) as "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."
How does SP affect our learning?

- Modulation is required for adapted response to sensory stimulation
- Important for development of play skills
- A variety of sensory experiences help shape our learning and understanding of the world
What are Autism Spectrum Disorders?

- New DSM-V Criteria
- DSM-IV distinguished between
  - Autistic Disorder (Autism)
  - Asperger’s Disorder (AD)
  - Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS)
DSM-V Criteria

Autism Spectrum Disorder

1. Persistent deficits in social communication and social interaction across multiple contexts
2. Restricted, repetitive patterns of behavior, interests, or activities
3. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life)
4. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning

5. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level
ASD Severity

- Level 1: Requiring Support
- Level 2: Requiring Substantial Support
- Level 3: Requiring Very Substantial Support
Sensory Dysfunction and ASD

- DSM-V criteria addresses sensory processing under the stereotyped/repetitive motor movements
- DSM-V notes differences in eye gaze: this is more likely due to a sensory dysfunction than social impairment
- Auditory processing disorder is the most commonly reported sensory-processing impairment in ASD
- Tactile hypo- and hyper-sensitivities are also prevalent in children with ASD
- Sensory sensitivities tend to be present in infancy and increase with age
- Praxis on verbal command is more affected in ASD
Sensory Dysfunction and ASD

- Visual system as area of strength
  - Excel at puzzles and mechanical tasks
- May be hypo- or hyper-sensitive to vestibular input
  - May not experience post-rotary nystagmus
- Close relation of vestibular and ocular systems $\rightarrow$ hand flapping, lining up objects, and other non-functional behaviors
Praxis

- Praxis: Ability to plan out and execute novel motor movements
- Children with ASD tend to have poor motor planning skills, especially in area of ideation
- Poor ideation leads to poor play skills and deficits in self-help skills
- Children with ASD can easily become prompt-dependent due to difficulties with praxis
Mirror neurons: learning through imitation

Dyspraxia has been strongly correlated with the social, communicative, and behavioral impairments that define autism

May be associated with “motor empathy” dysfunction → deficits in “theory of mind”
SPD...but no ASD?

- Estimates of 75%-100% of children with ASD have some degree of Sensory Processing Dysfunction...BUT many children with SPD do NOT have ASD
  - Joint Attention
  - Shared interest in activities
  - Engagement in self-stimulatory behaviors
  - Flat affect
Autism, Deafness and SPD

- Pre-intervention video
Unique SP Challenges for a Deaf Child with ASD

- Most common red flags in infancy for ASD:
  - 6 months: No big smiles or warm, joyful expressions
  - 9 months: No back-and-forth sharing of sounds, smiles, or other facial expressions
  - 12 months: No babbling, pointing, gestures
  - 16 months: No single words
  - 24 months: No 2-word spontaneous phrases
  - Any sign of regression (loss of language or social skills)
Unique SP Challenges for a Deaf Child with ASD: Tactile

- Tactile defensiveness may affect:
  - Ability to create accurate ear mold impressions
  - Wearing hearing aids or processor on ear
  - Light touch is often disruptive for a child with ASD: may be more so for a child who has no auditory clue that a person may be about to engage in physical contact
Unique SP Challenges for a Deaf Child with ASD: Auditory

- Auditory defensiveness:
  - When fit with amplification (hearing aids or CIs), some have an increased perception of loudness
  - Hyperacusis is common & can affect daily routines, quality of peer interactions and curiosity about the environment
  - Auditory processing deficits are common in children with ASD
Maladaptive Behaviors

- Aggression: aggressing towards others
- Self-injury: aggressing towards self
- Disruption: throwing items, banging on surfaces, etc
So what do we do?
Strategies

- Provide STRUCTURE!
- Use lots of VISUALS
- Limit verbal cues
- Increase wait time
- Use timers
- Be mindful of part: whole discrepancies

Instead of

Name
Kindergarten Time

Do you know what time it is, what time is it, what time it is?

Jake’s Morning Schedule

1. Wake up
2. Go to toilet
3. Wash hands
4. Dry hands
5. Put on pajamas
6. Put in drawer
7. Make bed
8. Time for breakfast
9. Go to school
10. See our friends
11. Eat lunch
12. Do our work
13. Go home
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Visual Strategies for Success

- Visual Timers:
Visuals to Assist with Learning: Structured Teaching

**Readiness Color - Concepts**

- Color sort into soap containers
- Package colored fish
- Package colored chips
- Package colored clothespin
- File pictures behind corresponding color tabs
- Match clothing by color
Vestibular and Proprioceptive Strategies

- Provide frequent breaks
- Provide opportunities for swinging/swinging/movement activities
  - Use couch cushions, tunnels, Lycra fabric as a “swing”
  - Engage child in obstacle courses
  - Be cognizant of contraindications of certain playground equipment with cochlear implants
- Provide safe “time-out” area to limit sensory input
Service Plan

- Intense frequency of high quality services top include 20-30 hours a week
- Occupational Therapy
- Speech Therapy
- Developmental Therapy
- Sensory Integration
- DIR/Floortime Therapy
- ABA Therapy
- TEAM COLLABORATION
● Video 5 months post intervention
Free Resources

CDC: [www.cdc.gov/actearly](http://www.cdc.gov/actearly)

- Tip Sheet for Talking with Parents
- Downloadable Developmental Milestones
- Tips for Parents to talk to their Physician
- Developmental Screening Process
- Publications available for free online

Learn the Signs. Act Early.
Free Resources

Autism Speaks: www.autismspeaks.org

- Links to First Signs (https://www.firstsigns.org/)
- Toolkits for parents and educators: http://www.autismspeaks.org/family-services/tool-kits
- Autism Apps
- Video Glossary
Recommended Books for ASD/SPD

- **Tasks Galore** ([www.tasksgalore.com](http://www.tasksgalore.com))
- **The Out-of-Sync Child** by Carol Kranowitz
- **1001 Great Ideas for Teaching and Raising Children with Autism Spectrum Disorders** by Ellen Notbohm and Veronica Zysk
- **Thinking in Pictures: and Other Reports of my Life with Autism** by Temple Grandin
- **The Curious Incident of the Dog in the Night-time** by Mark Haddon
- **Look Me in the Eye: My Life with Asperger’s** by John Elder Robison
Thank you for your time!

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Resources


