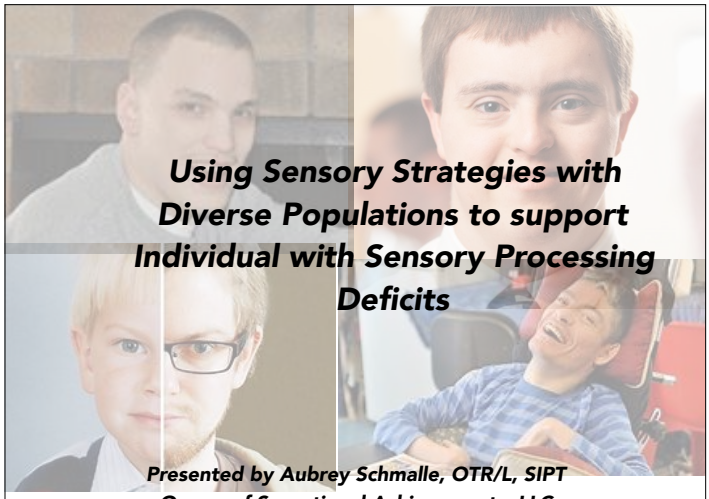
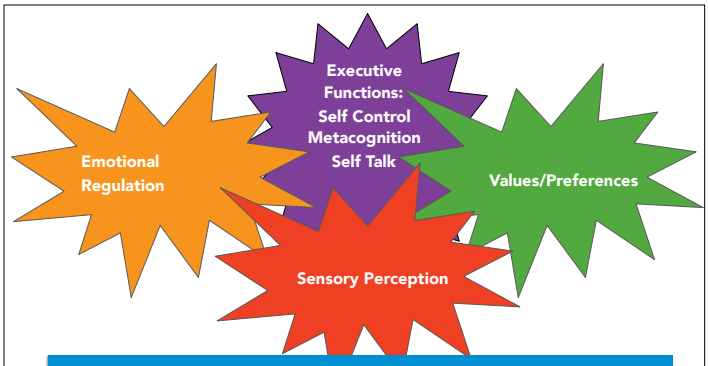


# *Using Sensory Strategies with Diverse Populations to support Individual with Sensory Processing Deficits*

***Presented by Aubrey Schmalle, OTR/L, SIPT***
***Owner of Sensational Achievements, LLC***

# *Objectives*

- Understand the patterns of behavior and adaptive response challenges for individuals with sensory processing disorders and related diagnoses
- Implement strategies for working on and accommodating for individuals with specific sensory needs and difference
- Learn how to recognize key aspects of sensory processing disorders in diverse populations




**Self Regulation and Adaptive Responses**



# *So What is Sensory Integration?*

The way the brain takes in and organizes information from the environment and from our bodies to adapt and respond to everything we experience throughout the day



# *Dr. Jean A. Ayers - Founder of Sensory Integration*

- Her research was done 1960's-1977 to explain the relationship between deficits in interpreting information from the body and the environment and difficulties with academics or motor learning.
- Sensory integration is a brain-body process. there is a dysfunction in the foundation, higher order skills will not develop
- Ayers believed self-esteem and actualization was linked to inner and motivation.



# *Dr. Ayers Believed….*

- Most people as children have the desire/inner drive for participation in sensorimotor and learning activities
- Learning is a multisensory process dependent on the integrity of sensory structures and sensorimotor experience
- Senses interact and link with higher-order centers of the brain to promote learning and development (Ayers - "Sensory Integration")
- Abstract reasoning, perception, language, and learning evolves from these experiences

# The Senses

Taste (gustatory)

Hearing (auditory)

Touch (tactile)

Smell (olfactory)

Sight (visual)

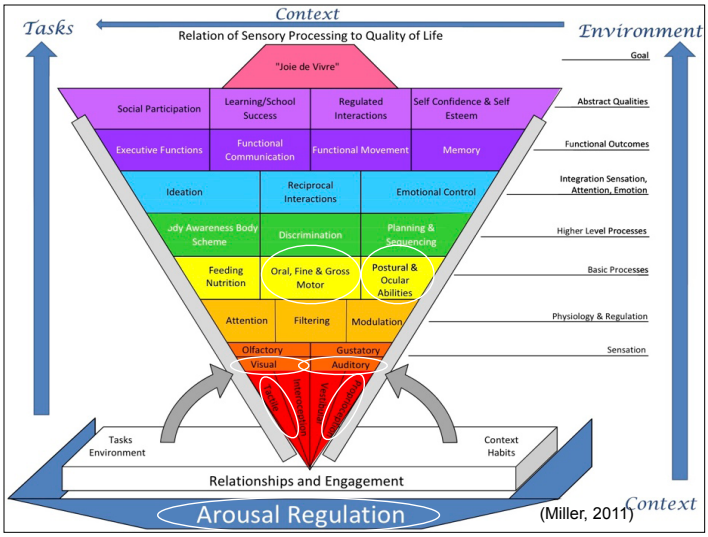


# The Hidden Senses

Proprioception:
Provides awareness of where body parts are and what they are doing
(receptors in muscles and joints)

Vestibular:
Responsible for sense of balance, space and speed/ direction of movement
(receptors in the inner ear)






(Miller, 2011)

# Effective Sensory Processing allows a person to...

- Self-regulate emotions and arousal
- Establish motor skills, social skills, and play skills
- Interact with and explore the environment to learn independently
- Engage in age-appropriate activities and develop independence in daily routines



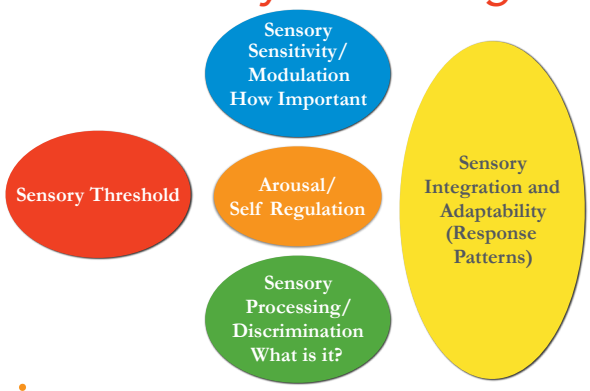
# Sensorial Assumptions

- Adequate orientation to and processing of sound
- Good body awareness and body control
- Stable posture and adequate coordination
- Good auditory processing and listening
- Adapts and responds appropriately to sensory stimulation
- Uses vision to guide body, direct actions, and sustain attention to task
- Adequate spatial perception and movement processing

# Observed Behaviors

- Emotional
- Disruptive
- Disconnected
- Rigid
- Inattentive
- Behavior issues
- Clumsy
- Off-Task
- Poor transitions

# Sensory Processing



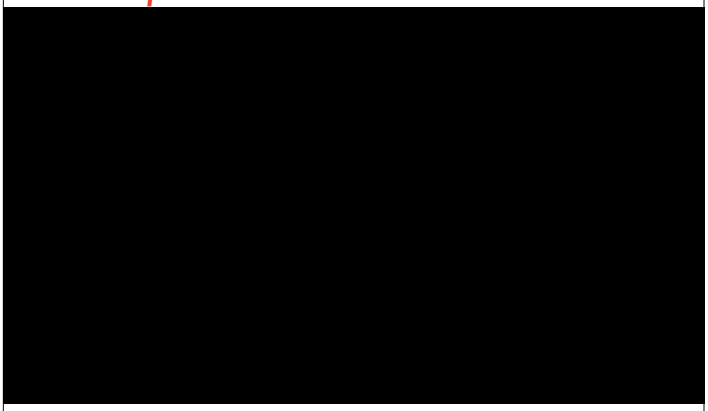



| Sensory Modulation Disorder | Sensory Discrimination Disorder | Postural-Ocular Disorder | Dyspraxia |
|---|---|---|---|
| • Easily distracted<br>• hyper aware of touch and/or sounds in the environment<br>• Rigid/Controlling behaviors<br>• Defensive reactions to food and/or clothing textures<br>• Easily distracted by sensory stimuli<br>• Lack of response to sensory stimuli<br>• Disconnected/Disengaged | • Poor force grading<br>• Easily disoriented with movement<br>• May/may not have anxiety with movement<br>• May seek sensation via movement, bumping into peers, or putting objects in their mouth<br>• May have poor balance and body control | • Does not use vision to guide his/her body<br>• May be unsafe or overly cautious<br>• May avoid unpredictable environments<br>• Falls/loses balances easily<br>• Trips/Is Clumsy<br>• Difficulty sitting still for long periods<br>• May fidget/move around a lot<br>• May seek sedentary play versus gross motor activities | • Difficulty completing daily activities<br>• Difficulty following multi-step directions requiring motor skills<br>• Often takes an awkward approach to novel motor tasks<br>• Takes a long time to learn new skills<br>• May have poor handwriting and/or fine motor skills<br>• May avoid team sports or coordinated activities |
| **What is it?** | **What is it?** | **What is it?** | **What is it?** |
| Over or under-responsivity to various types of sensory inputs that can worsen in times of stress. It is often observed as emotional outbursts, withdrawal, and negative responses to situations that don't seem to bother others. | Difficulty understanding the details of sensory information resulting in limited or inaccurate body feedback. It can result in disorientation, confusion, and clumsiness or trigger sensory-seeking behaviors to get more feedback. | Presents as poor postural control, tensing, and use of compensatory strategies such as relying on arm strength due to lack of dynamic body control. Inadequate use of vision to guide body movements impacts safety. | Presents as difficulty developing ideas about what to do with one's body and objects as well as difficulty planning/organizing and following through with activities. It is typically most obvious with new learning tasks, novel activities, or activities done infrequently. |

# Sensory Modulation



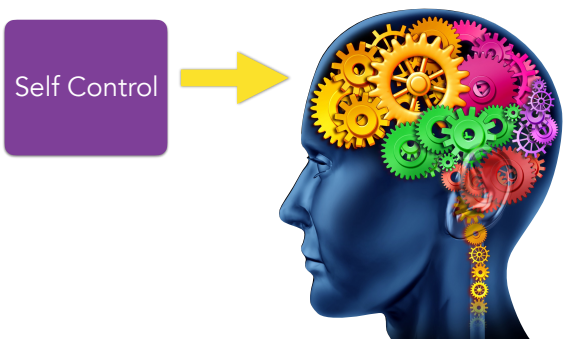

# Experience It for Yourself!



# Self Regulation Foundations




# Self Control is an Executive Function



## Chronic Stress and Poor Self-Regulation

Chronic stress increases cortisol levels in the brain

Cortisol is responsible for facilitating the process of cell death and reduction in dendrites available for synapses and shrinkage in the limbic system

Chronic stress alters basic regulatory capacities and future responses to stress

Children with communication delays, motor delays, and sensory processing deficits may experience higher levels of stress as a result



## How Do You Improve Modulation?

- Caregiver: Implement Sensory Diets and Accommodations to improve arousal/Organization
- OT and Caregiver: Input to Alert or Calm and Organize using Body Activated Learning principles
- Occupational Therapist: Sensory Stimulation Protocols: Wilbarger Brushing Program, Spinning Protocol, Listening Programs
- Occupational Therapist with Caregiver: Progressive Desensitization techniques to improve tolerance of sensation



## Key Components of a Sensory Diet

- Sensory Snacks (quick supports/tools)
- Sensory Breaks (3-4 longer movement breaks)
- Supportive Leisure and Routines
- Environmental Modifications: Time, tolerance, safe spaces, toolbox

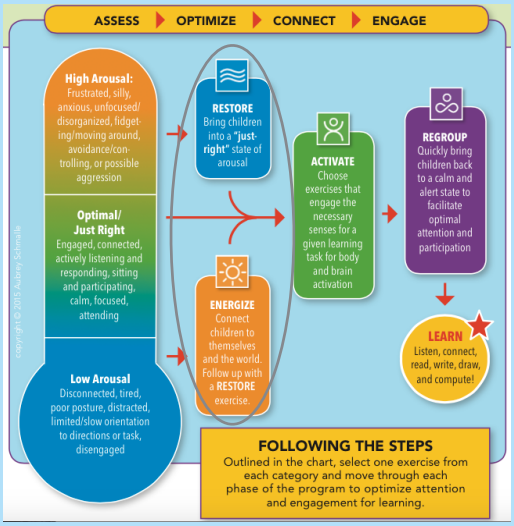


## Sensory Snacks: Build a Toolbox




## Sensory Snacks: Environmental Opportunities





## Speed, Unpredictability, Movement

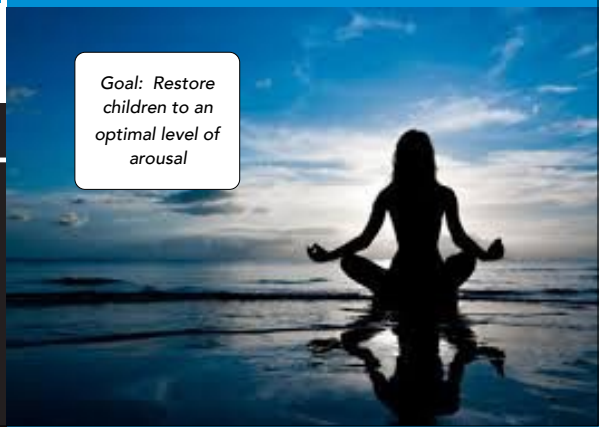
Energize

Goal: Increase alertness and engagement

## Rhythm, Pressure, Respiration

Restore

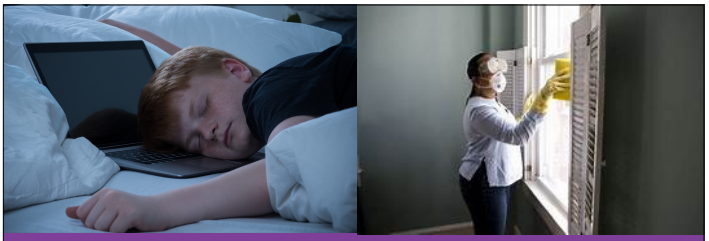
Goal: Restore children to an optimal level of arousal



"Breathe in deeply to bring your mind home to your body"

-Thich Nhat Hanh

**Restore**



The Basics: Eating, Sleeping, Activity Level, Routines

## Optimize arousal through chores and routines



## Choose the right leisure activities

## How do we help people with sensory modulation differences feel safe?




## Environmental Modifications

How long can someone tolerate a particular environment?

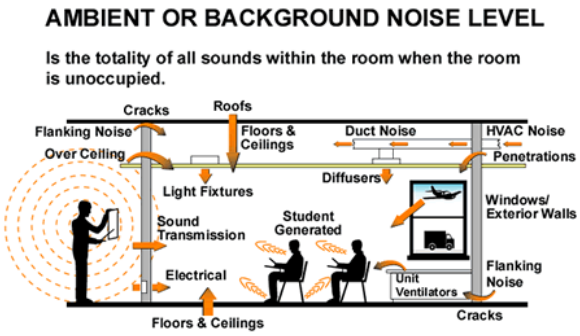
Can you identify a safe space for a person to go if they are feeling overwhelmed?

When is the best time of day to do something or go somewhere?

What should I have available/what should the person bring before, after, or during a particular activity?



## Accommodations: Auditory Defensiveness






## Accommodations: Auditory Defensiveness

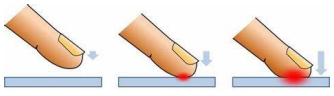
Staying near the walls

Sitting in the back

Sound Absorbtion



## Accommodations: Tactile Defensiveness



Use firm touch

Approach from the front

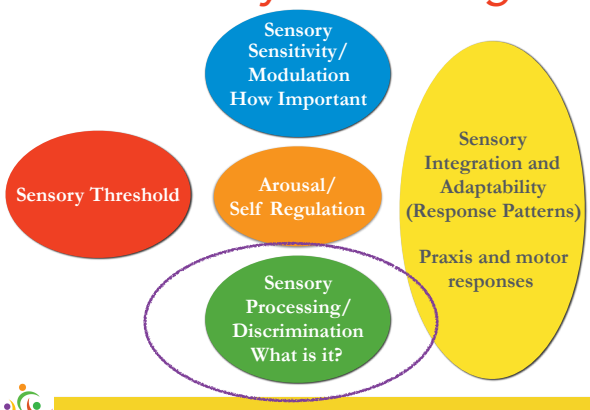
Find the right clothing texture and weight



## Populations who present with modulation difficulties

- Autism
- Schizophrenia
- ADHD
- Fragile X Syndrome
- Down Syndrome
- Fetal Alcohol Syndrome

# Sensory Processing



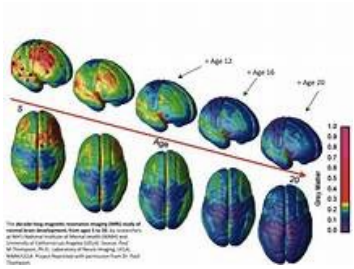



Sensory and motor systems that fire together wire together to form functional neural networks in a developing brain to develop motor, speech, and cognitive abilities

- Donald Hebb, 1949

# Brain Growth and Development

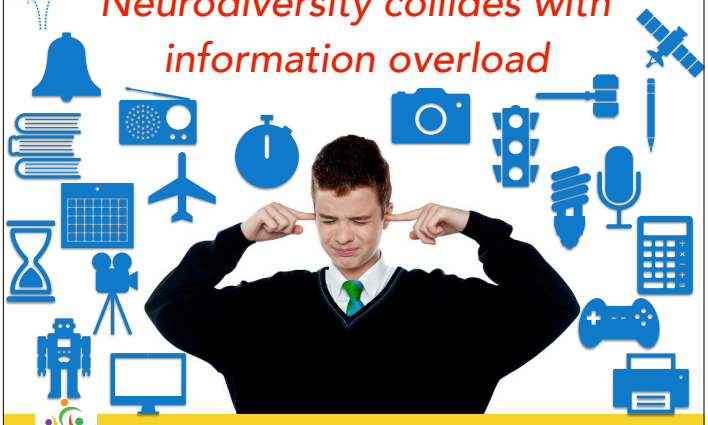
- Brain growth involves synaptic overgrowth and pruning
- Edelman (1992) said connections shift and reassemble as a result of a dynamic series of events
- The brain is a self-organizing system based on development, genetics, and the environment



Sensory Integration with Diverse Populations, Pg 31.



# Neurodiversity collides with information overload





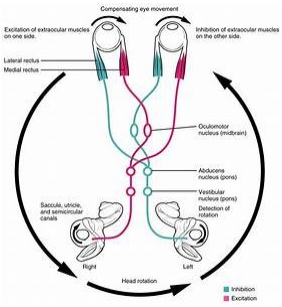
# Vestibular System

- Understanding of Location in space
- Perception of speed ar direction
- Orientation to gravity
- Integrates with the visual, somatosensory, and auditory systems



# Visual System

- Gives information about distances from objects and identify where sounds are coming from
- Vision depends on acuity, binocular vision and ocularmotor control
- Depth perception, near/far vision, sustained visual attention, attention shifting



# Visual Dysfunctions

- People with only one eye or specific vision impairments will interact differently with their environment than people with intact vision



# Vestibular-Mediated Visual Skills

- Visual Fixation = Sustained Focus
- Tracking = Following a moving person/object
- Convergence/Divergence = Shifting between teacher and desk work
- Quick Localization = Visual attention shifts in space to monitor peers/objects
- Saccades = Attention shifts needed to read/monitor



# Somatosensory System: Tactile and Proprioception

- **Exteroceptors:** On the skin: Pain/Temperature/light touch/texture/edges and curves
- **Proprioceptors:** Body scheme and awareness of body parts
  - Grade muscles/use the appropriate amount of force for a given task (ex: pencil pressure, hand shakes, jumping, lifting versus dragging objects)
  - Differentiate between light and hard touch
  - Perception of the weight of objects
- **Interoceptors:** Internal body conditions - toileting, hunger, blood pressure

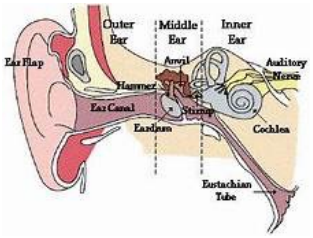


# How Sensations Interact to Control Body Movement




# Auditory System

- Give us a sense of the size of a room and where sounds are coming from
- Allows us to differentiate between sounds for language development and to select the most important sounds to attend to
- Helps us differentiate between foreground and background sounds






# How Do We Improve Discrimination and Motor Skills?

- Sensory Integrative Treatment
- Listening Programs/Forbrain
- Body Activated Learning
- Specific treatment exercises that train sensory systems to work together

## How Do We Improve Discrimination and Motor Skills?

Sensory Integrative Treatment

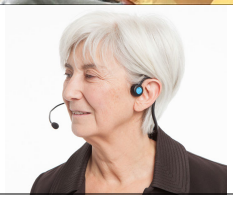


## How Do We Improve Discrimination and Motor Skills?

Listening Programs/Forbrain

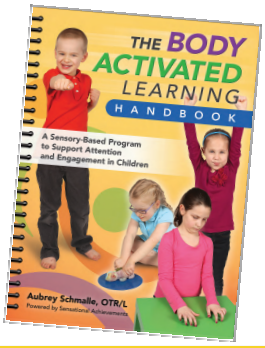
www.tomatis.com

TOMATIS®

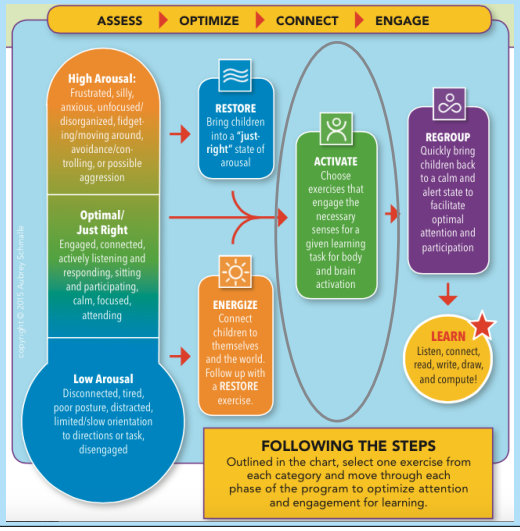


## How Do We Improve Discrimination and Motor Skills?

Body Activated Learning






## Move, Learn, Connect

## Get Ready, Get Set, Go

Windmills

## Daily Opportunities

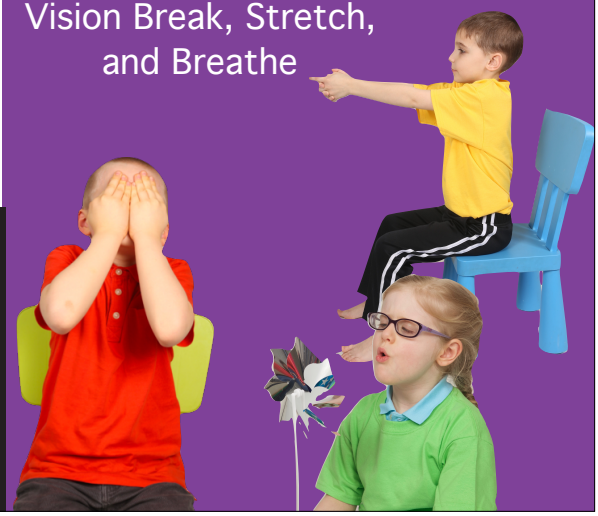



## Games and Leisure




## Vision Break, Stretch, and Breathe

Regroup



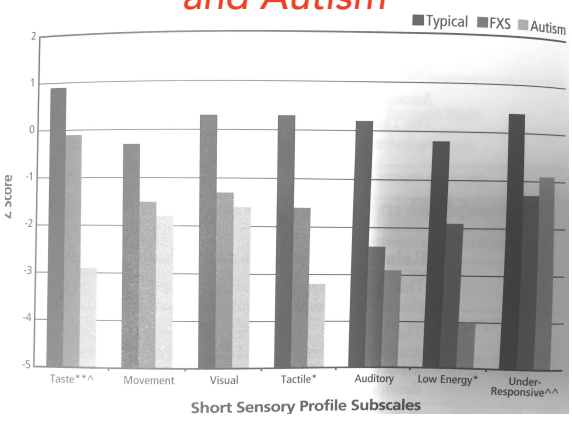
## Vision Break, Stretch, and Breathe

Regroup



## How does this apply to different populations?

## Sensory Profiles for Fragile X and Autism



# Autism

- Atypical EDR - low/under-responsive
- Behaviorally often over-responsive to input (taste, smell, visual, movement)
- May seek or avoid movement
- Poor eye contact and visual attention
- Emotional dysregulation
- Praxis and motor deficits

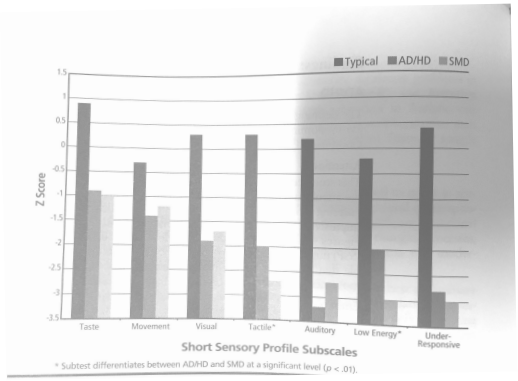


# Fragile X Syndrome

- Strabismus impacts vision
- Atypical EDR, sensory over-responsivity and hyperreactivity especially smell
- Difficulty with emotional regulation
- Difficulty with Adaptability and behavior



# Sensory Profiles for ADHD and SMD




# Attention Deficit Disorder

- Atypical electrodermal response to sensory stimuli
- Problems with Auditory filtering
- Over-responsive to tactile and visual input
- Both seek and avoid movement depending on subtype
- Hyperocular eye movements
- Differences in postural reactions



# Down Syndrome

- Atypical Electrodermal responses to sensory input
- Low muscle tone and mobility impairments impacting sensory input and processing
- Hearing loss common
- Vision: Acuity, Depth perception



# Cerebral Palsy

- May have both sensory modulation and discrimination deficits
- Traditional motor interventions should be combined with sensory principles for improving adaptive motor and postural responses.
- Limitations in movement can impact vestibular input and processing

# Fetal Alcohol Syndrome

- Sensory issues and problem-behaviors co-occur in this population
- Behaviors are more likely when there is also a sensory processing deficit
- Difficulty processing auditory stimuli and modulating sensory input resulting in seeking or under-responsivity
- High prevalence of mental health and psychiatric disabilities (Anxiety, ADHD, explosive disorders)

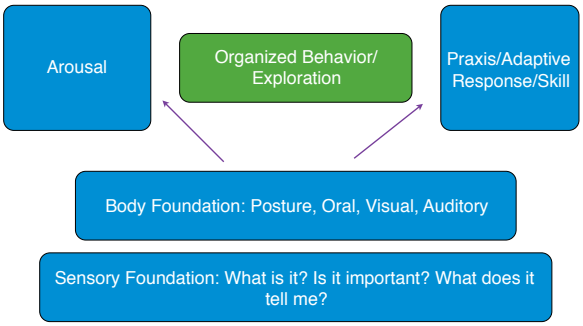


# Schizophrenia

- People with Schizophrenia experience sensory hyper-reactivity and shut down physiological and behaviorally in a "blocking reaction" (Chapman, 1966)
- Have impaired processing of auditory stimuli
- Visual processing and depth perception may be compromised
- Reduced somatosensory perception and olfactory discrimination



# The Balancing Act




# How do you influence behavior?

"No one else uses that"

"I don't feel like it"

"I don't need it"

"I don't care"

"Don't tell me what to do"



# How do you support individuals with sensory differences?

Be a good observer

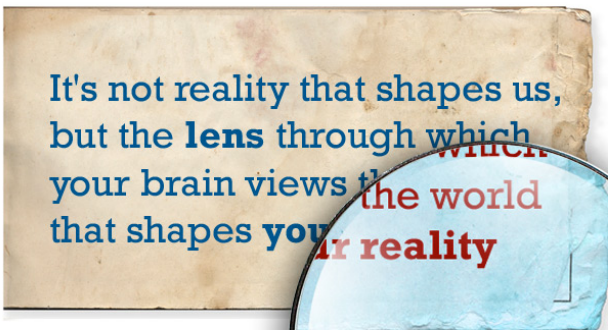
Ask good questions

Provide intervention and support based on the sensory profile, not the diagnosis

Respect individual needs/preferences

Have a toolbox and prepare the environment





# References


- Ayres, A.J. (1972a). Sensory Integration and Learning Disorders. Los Angeles: Western Psychological Services.
- Ayres, A.J. (1979). Sensory Integration and the Child. Los Angeles: Western Psychological Services.
- Bundy, C. Lane, S., Murray, E.A (2002). Sensory Integration Theory and Practice, 2nd Ed. Philadelphia, PA: F.A. Davis Company.
- Champagne, T & Koomar, J (2012). Evaluating sensory processing in mental health occupational therapy practice. OT Practice, 17(5), CE-1-CE-8.
- Franklin, L., Dietz, J., Jirikowic, T., & Astley, S. (2008). Children with fetal alcohol spectrum disorders: Problem behaviors and sensory processing. American Journal of Occupational therapy, 62, 265-273.
- Herdman, Susan, J., (2007). Vestibular Rehabilitation (3rd ed.). Philadelphia: F.A. Davis Company.
- Gentile, Michele. (Ed.). (2005). Functional visual behavior in children: An occupational therapy guide to evaluation and treatment options (2nd ed.). Baltimore: American Occupational Therapy Association, Inc.




# References


- Javitt, D.C. (2009) Sensory processing in schizophrenia: Neither simple nor intact. Schizophrenia Bulletin. Nov; 35(6): 1059–1064.
- Leigh, J.R., & Zee, D.S., (2006). Neurology of eye movements (4th ed.). New York: Oxford University Press, Inc.
- MacKinnon, M (2016). The science of slow deep breathing. Retrieved from: https://www.psychologytoday.com/us/blog/neuraptitude/201602/the-science-slow-deep-breathing
- Schmalle, A. (2015). The Body Activated Learning Handbook. Stamford, CT.
- Smith Roley, S., Blanche, E.I., Schaaf, R.C (2001). Understanding the Nature of Sensory Integration with Diverse Populations. Austin, TX: PRO-ED, Inc.
- Smith Roley, & Schaaf, R.C (2006). Sensory Integration: Applying Clinical Reasoning to Practice with Diverse Populations. Austin, TX: PRO-ED, Inc
- Schaaf, R.C & Lane, S.J. (2009). Neuroscience foundations of vestibular, proprioceptive, and tactile sensory strategies. OT Practice 14(22), CE-1-CE-8.




# More Resources

- Sign Up for our Newsletter for information on events, news, activity suggestions, and new products
- Like us on facebook or Follow Us on
- Check out our Pinterest pages for food art, toys/games, resources/articles @SensationalAOT
- Check out our website for articles, activities, resources www.sensational-achievements.com



## Sensational Achievements


1011 High Ridge Road, Suite 300
Stamford, CT 06905
(203) 200-7256

**Aubrey Schmalle, OTR/L**

aubrey@sensational-achievements.com