



Demystifying Sensory Approaches to Intervention for Children with Autism Spectrum Disorder

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Sensory Experiences in Daily Life



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Sensory Experiences are “Multi-Modal”





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Sensory Experiences are “Multi-Modal”

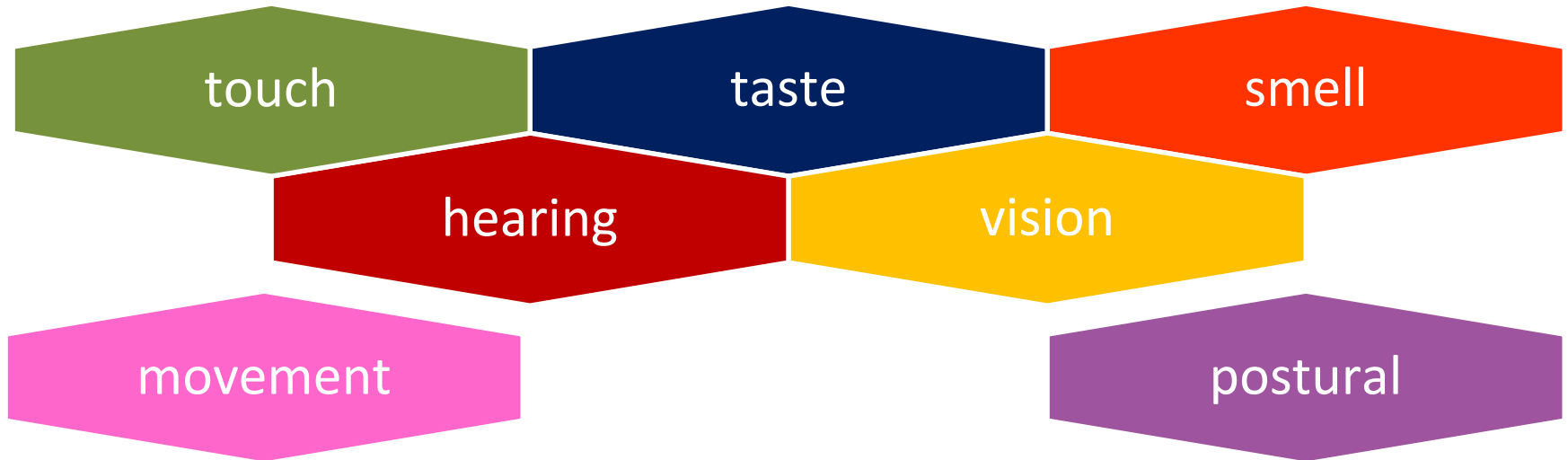
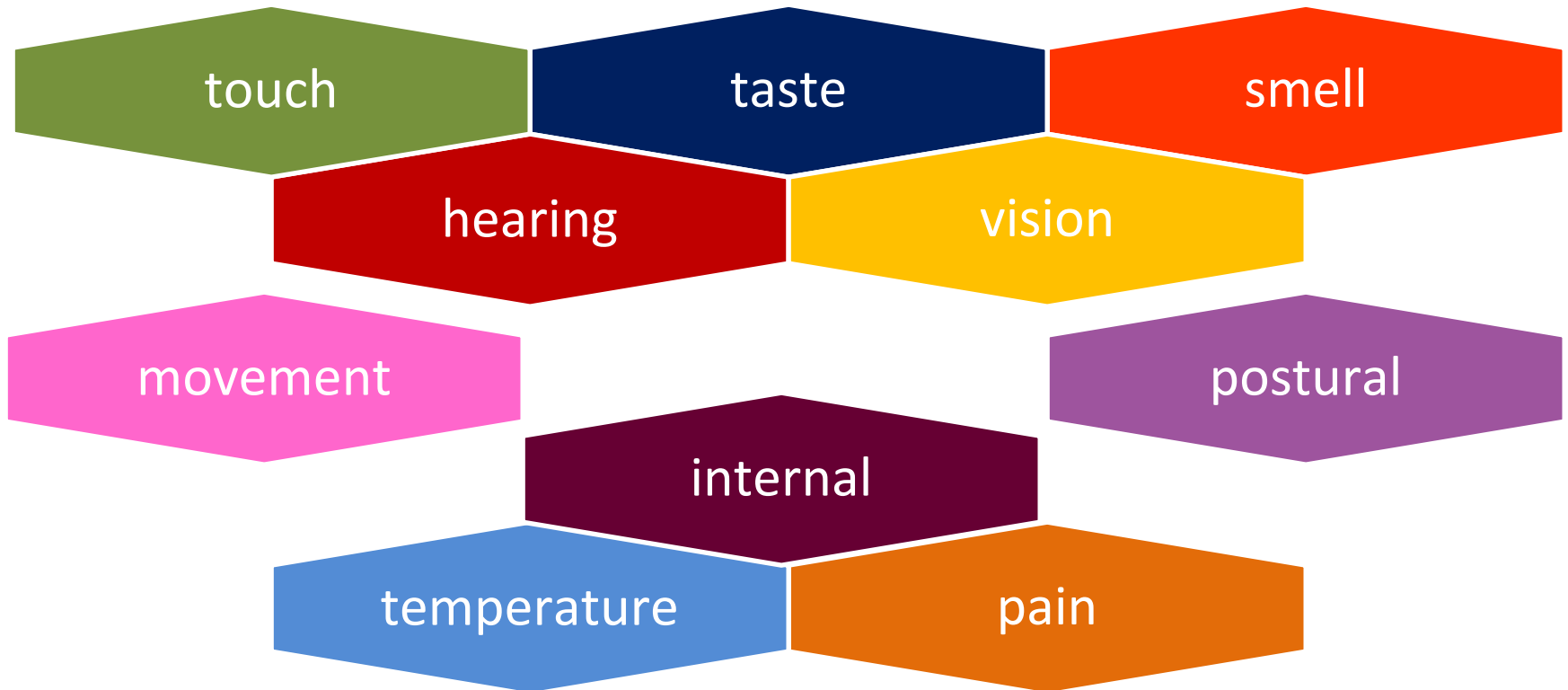




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Sensory Experiences are “Multi-Modal”





Objectives

Recognize

common sensory features in children with ASD and their potential impact on daily life routines.

Understand

differences across sensory approaches: ASI[®], sensory-based interventions, & sensory environmental modifications.

Consider

optimal ways to communicate with team members about sensory issues and interventions.

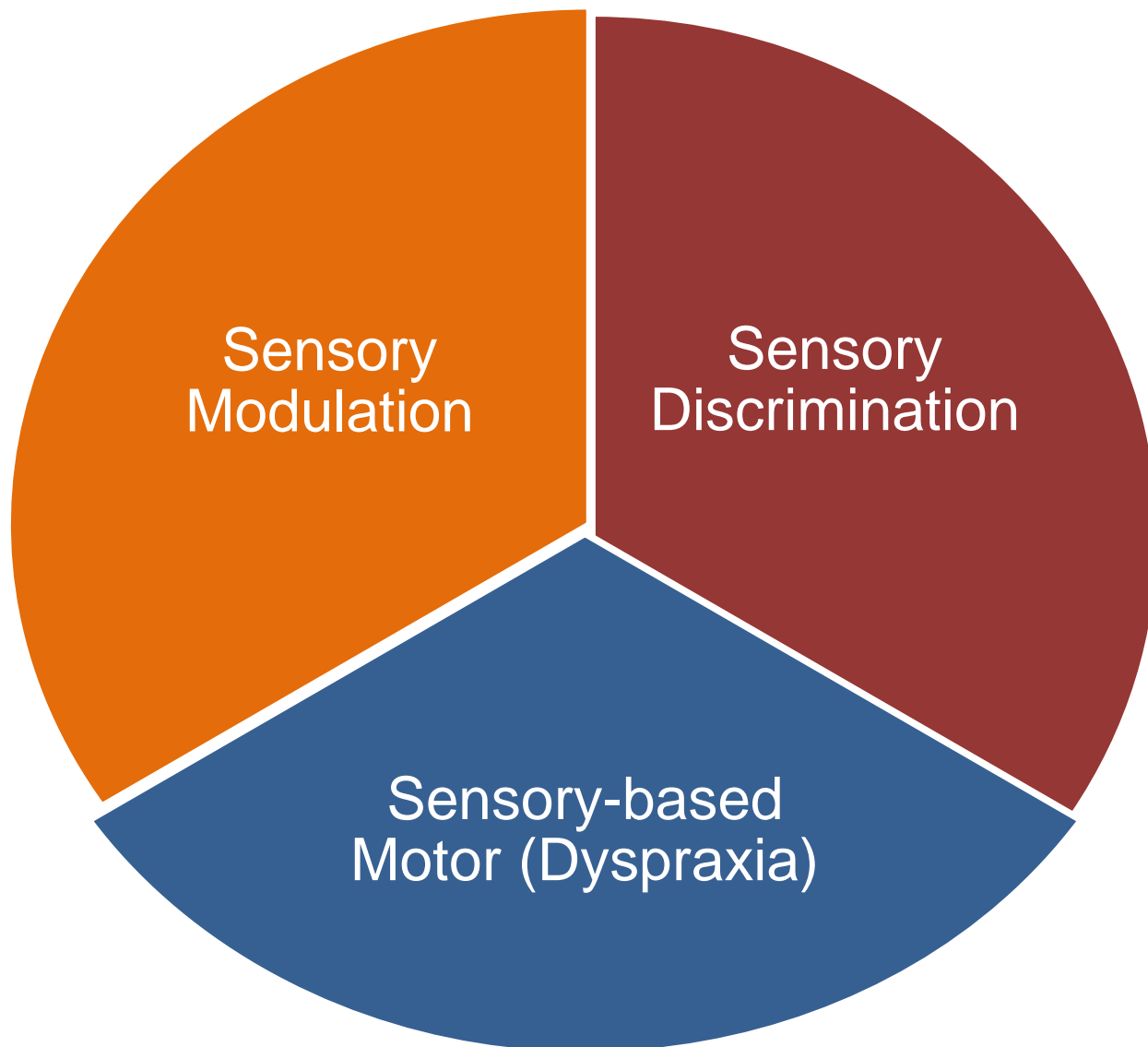
Common Sensory Features in ASD



Photo by Jennifer Borget from Cherish 365

- Sensory features are highly prevalent in ASD and reported across all modalities
- Differences may appear very early in life
- These are intricately linked with motor planning challenges
- May diminish as children mature and gain coping skills, but sensory patterns are noted to be stable over time

Types of Sensory Processing Challenges



Sensory Modulation

- The brain's ability to filter sensations and regulate an optimal level of alertness
- Sensory modulation difficulties may result in trouble processing the nature or intensity of sensory input to be matched to the demands of the environment
- Three common patterns:
 - Sensory Over-responsivity
 - Sensory Under-responsivity
 - Sensory Seeking
- Patterns may co-occur (*Ausderau et al., 2014; 2016*)



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Sensory Over-Responsivity

- Characterized by an exaggerated or aversive response to sensory stimuli (that wouldn't bother most people)
 - **Other terms:** hyperresponsiveness; sensitivities; defensiveness
 - **Examples:** child shows discomfort to grooming or haircuts or covers ears to block out sounds
 - **Potential Impacts:** easily distressed in busy environments; avoids specific activities (e.g., tooth brushing; picky eating; hypervigilance; sleep problems; anxiety)
- *Child interview (age 11 y/o)* (Kirby et al., 2015)
 - In response to unpleasant sounds: *"It feels like heart is beating (pause) and um, my, uh, my whole body's shaking.... and my eyes, uh, they start to blink a lot."*

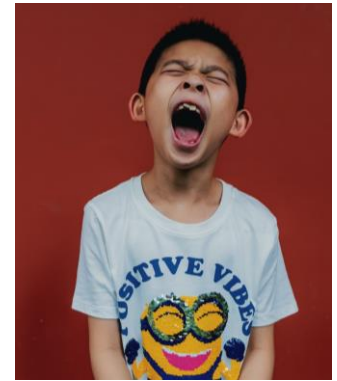


Photo by Xia Yang from Unsplash

Sensory Under-Responsivity

- Characterized by a lack of, less intense, or delayed response to sensory stimuli (that most people would notice quickly)
 - **Other terms:** hyporesponsiveness; poor registration
 - **Examples:** child does not notice/orient to a novel sound; has diminished response to pain
 - **Potential Impacts:** may miss important learning and social opportunities; safety concerns; passive in classroom (gets less attention if not a behavior problem)

- Parent interview:

“If he gets hurt...he will be bleeding and he will cry just for a second and then it will be over with, and he will have a huge goose bump. Most kids this age would be screaming and crying for awhile.”



Photo from lovelyadlinalin's blog

Sensory Seeking

- Characterized by a fascination with or craving of sensory stimulation, which is intense and may be repetitive in nature
 - **Other terms:** sensation seeking; intense sensory interests or cravings
 - **Examples:** child may show a fascination with flickering lights, rubbing textures repeatedly, or craving deep pressure
 - **Potential Impacts:** may seem preoccupied; repetitive behaviors with body or objects; trouble disengaging attention to something more important; safety issues

- Parent interview:

“Even before we knew he was autistic, he bounced and bounced and bounced...even for a 2 year old that was a lot of bouncing. We used to call him our Tigger boy.”



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Sensory Discrimination

- The brain's ability to tell the difference between two different stimuli, which helps you effectively interact with objects and perform daily tasks
- May result in trouble recognizing objects, distinguishing different flavors, finding your place on a keyboard, etc.
- Some children with ASD show “Enhanced Perception” – or the ability to perceive differences in stimuli with better than average ability



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Enhanced Perception (EP)

- Characterized by superior acuity, awareness, and/or discrimination of specific sensory elements
 - **Other terms:** hyper-acuity; detail-oriented; “eagle-eyed”
 - **Examples:** Child notices a sound or smell before others do; recognizes perfect pitch or minor differences in visual patterns
 - **Potential Impacts:** Very skilled with some tasks (e.g., puzzles); good at noticing details/targets; challenges seeing “gestalt”; synesthesia

Bury et al., 2020; Mottron et al., 2006



Praxis (Dyspraxia)



- Praxis is the brain's ability to direct motor action
 - Involves conceptualizing & planning purposeful movements
 - Knowing “what” to do and “how” to do it
- Dyspraxia refers to developmental causes of motor planning challenges that stem from problems integrating sensory information (e.g., proprioception, tactile, vestibular senses)
- Children with dyspraxia may appear clumsy, have trouble imitating movements, and may struggle with playing sports, manipulating fasteners, or tool use (writing/cutting), etc.
- May lead to challenges with internal “body scheme”, self-esteem, play/leisure, and social participation.

Sensory Processing Challenges: Impact on Family Participation



Photo by Frank Porter Graham from Child Development Institute, UNC

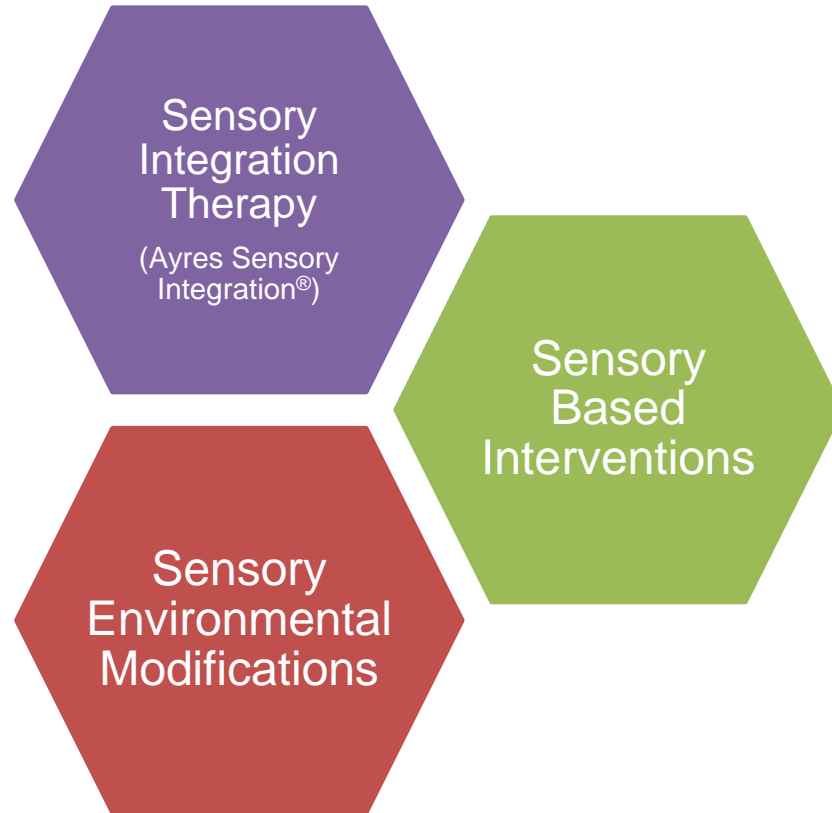
- Sensory processing challenges experienced by one child may affect the whole family across multiple areas of family life
 - Meals, sleep, social participation, leisure and education (*Ismael, Lawson, & Hartwell, 2018; Schaaf, Toth-Cohen, Johnson, Outten, & Benevides, 2011; Bagby, Dickie, & Baranek, 2012*)
- Family activities and routines may change (*Bagby et al., 2012; Pfeiffer et al., 2017*)
 - Parents spend more time preparing for activities
 - Family members may have to do things separately, which decreases shared meaning of activities
 - Parents may actively avoid activities or environments that are a “bad fit” for their child’s sensory preferences

Sensory Processing Challenges: Impact on Family Participation

- Higher levels of sensory over- and under-responsivity have been associated with more caregiver strain. *(Ausderau et al., 2016; Ben-Sasson et al., 2013; Gourley et al., 2013; Kirby et al., 2015; Nieto et al., 2017)*
- Challenges increase under unusual circumstances (e.g., pandemic) -- typical routines are disrupted and social participation is restricted.
- Thus, occupational therapists are often consulted for strategies that may help with the child or family unit to engage more successfully in daily activities or “occupations”.



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Three General Categories of Sensory Approaches



Levels of Research Evidence

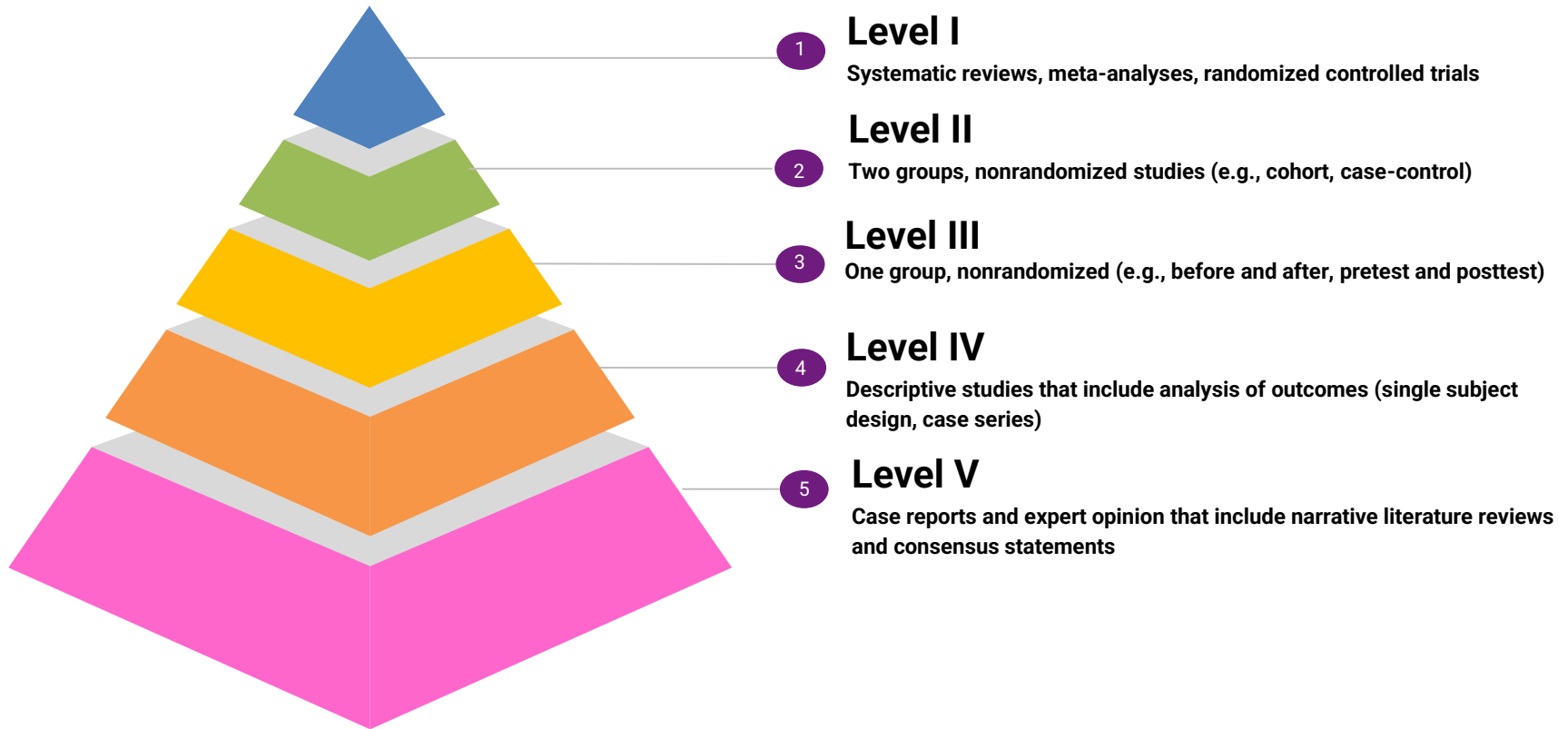




Photo from Tumble N' Dots Pediatric Therapy Clinic



Photo by Phil Channing from USC Chan

Sensory Integration Therapy

(Ayres Sensory Integration®)

Photo by Phil Channing from USC Chan



Photo from Bergen Pediatric Therapy





ASI®

Sensory Integration Therapy

- Established by A. Jean Ayres, PhD, OTR, FAOTA
 - Based on years of theoretical development and empirical studies about children with significant sensory processing challenges, including ASD
- “Sensory integration is the organization of sensations for use”
- The term *sensory integration* has been used to describe a variety of treatments

(Ayres & Robbins, 2005)



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Photo from Sensory Integration Global Network



Sensory Integration Therapy

(Also known as ASI®)

What is It?

- A child directed treatment involving:
 - a trained therapist
 - a large room with specialized sensory equipment
 - sensory input focusing on body movement and touch

What is the purpose?

- “...to provide and control sensory input... in such a way that the child spontaneously forms the adaptive responses that integrate these sensations” (Ayres & Robbins, 2005)
 - An *adaptive response* is “a purposeful, goal directed response to a sensory experience”



Photo from Baptist & Reflector



ASI®

Ayres Sensory Integration (ASI®)

- Ayres Sensory Integration (ASI®) was trademarked in 2007 to differentiate Sensory Integration Therapy, as established by Dr. Ayres, from other sensory based interventions and approaches.
- It was trademarked to maintain the core principles developed by Dr. Ayres.

(Smith Roley et. al., 2007)



Photo by Julie Bissell, USC Chan



ASI[®]

Core Components of ASI[®]

- Provide a range of **sensory opportunities**
 - tactile, proprioceptive, and vestibular
- Promote **self-regulation and alertness**
- Challenge **posture and motor planning**
- **Collaborate** on activity choices
- Create the “**just-right challenge**”
- Support internal motivation to **play**

(Parham et al., 2011)



Photo by Phil Channing from USC Chan



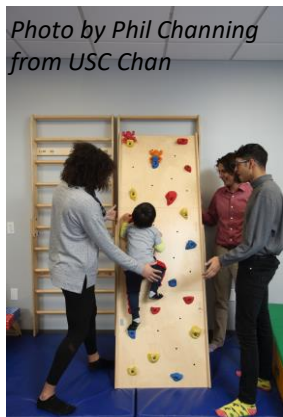
Photo by Ashley Weycer from Pinterest



ASI[®]

Core Components of ASI[®]

- A qualified therapist
- Physical environment
 - Individualized arrangement of equipment
 - Suspended equipment to hang swings
 - Bouncing and climbing equipment, crash pillow, scooter board, weighted objects, etc.
- Collaboration with parents and/or teachers



(Parham et al., 2011)



Fidelity Measure for Ayres Sensory Integration®

- A fidelity measure was developed for research to specifically assess outcomes of ASI®
- Fidelity is the “the extent to which an intervention is **faithful to its underlying theoretical and clinical guidelines**” *(Parham et al., 2007)*
- The measure:
 - Provides a basis to analyze previous and future research studies using ASI®



Photo from Summit Pediatric Therapy



ASI[®]

ASI[®] Research Evidence

Evidence and Effectiveness:

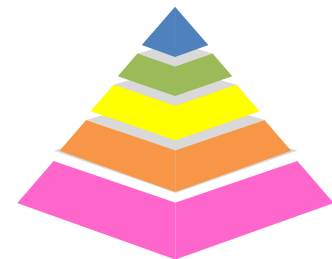
- Three Level 1 Studies



Photo by Phil Channing from USC Chan

Schaff et al., 2014

- **Level 1 Evidence**
- Children with ASD between 4 to 8 years
- Treatment group improved in:
 - Individual goals
 - Independence in daily life (decreased assistance from caregivers)
 - Social participation





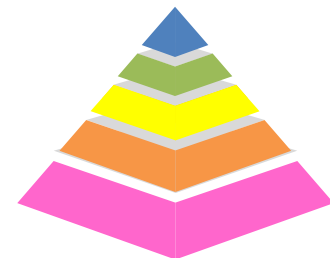
ASI[®] Research Evidence

Pfeiffer et al., 2011

- **Level 1 Evidence**
- Children with ASD 6-12 years
- Treatment group improved in:
 - Individual goals
 - Autism mannerisms (decreased)



Photo by Jaime Sumersille from Sensory Beans children's gym





ASI[®] Research Evidence

Kashefimehr, Kayihan & Huri, 2017

- **Level 1 Evidence**
- Children with ASD ages 3-8 years
- Treatment group improved in:
 - Communication and interaction skills
 - Motor skills
 - Sensory processing abilities



Photo from Tumble N' Dots Pediatric Therapy Clinic

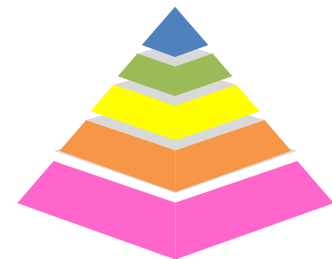


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Sensory Based Interventions (SBIs)



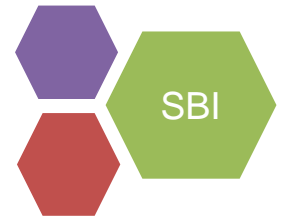
Photo by Courtney Shea from NAPA Center



Photo by Wolff from Miss Bindergarten's Classroom



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Sensory Based Interventions (SBIs)

Passive SBIs:

- Adult-directed
- Applied to child *or* placed on/in an object/device
- Stand alone *or* fit into child's daily routine

Examples: brushing; weighted vests/blankets; massage; being rocked, bounced, or swung passively

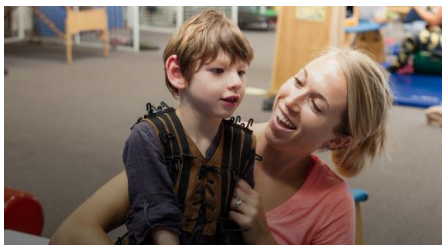


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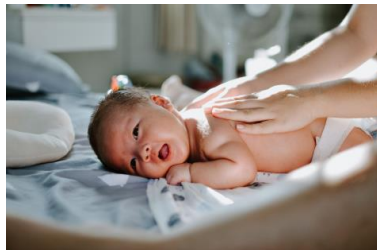
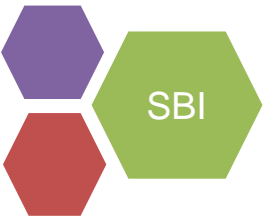


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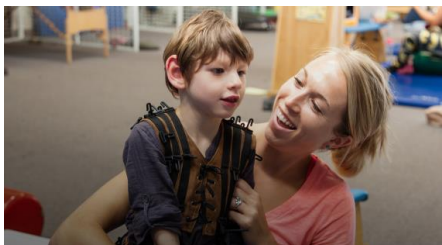


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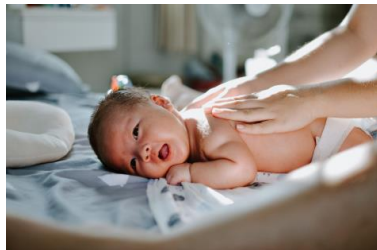


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Active SBIs:

- Child-led (active role)
- Child initiates and/or engages in intervention
- Fits into child's daily routine

Examples: “heavy” work, animal walks, fidget toys, food/snacks



Photo by Robson from CBC Parents



Case-Smith et al., 2015



Passive SBIs: Weighted Vests

What is it?

- Vest that provides proprioceptive input to muscles and joints

What is the purpose?

- Increase focus and attention
- Improve arousal regulation
- Decrease anxiety

Evidence & Effectiveness:

• **Level IV evidence**

- No effect on in-seat behavior (Cox, Gast, Luscre, & Ayres, 2009)
- No effect on stereotypical behaviors in ASD & ADHD (Lin, Lee, Chang, & Hong, 2014; Hodgetts, Magill-Evans, & Misiaszek, 2001)
- No effect on problem behaviors or joint attention (Leew, Stein, & Gibbard, 2010)
- No effect on engagement during table-top activities (Reichow, Barton, Sewell, Good, & Wolery, 2010)

• **Level I evidence**

- Improved in-seat behavior and attention for children with ADHD (Lin, Lee, Chang, & Hong, 2014; Buckle et al., 2011)

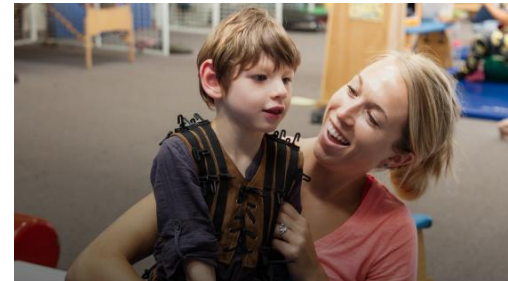
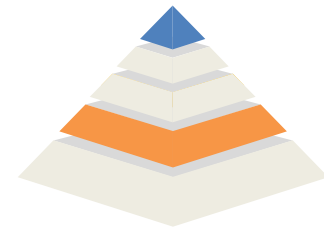
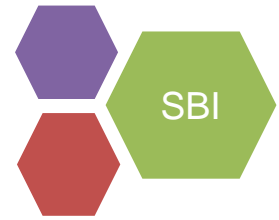


Photo from Courtney Shea from NAPA center





Passive SBIs: Brushing

What is it?

- Using a brush to apply firm, even pressure to the body (arms, hands, legs, feet)
- Most commonly used: Wilbarger Protocol [a.k.a the deep pressure and proprioceptive technique (DPPT)] *(Wilbarger & Wilbarger, 1991)*

What is the purpose?

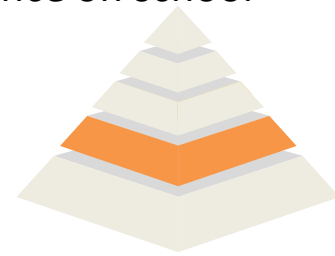
- Provide deep pressure to children who may be very sensitive to touch
- Improve emotion and behavior *(Bodison & Parham, 2018)*

Evidence & Effectiveness:

- **Level IV evidence**
 - Wilbarger protocol had no significant effect on stereotypical behavior *(Davis, Dunrand, & Chan, 2010)*
 - Brushing (DPPT or nonspecific technique) promoted increased performance on school tasks *(Benson, Beeman, Smitsky, Provident, 2011)*



Photo from Guo Hua Therapy & Consultation Center





Active SBIs: Fidget Toys

What is it?

- Small, portable tool (e.g., stress ball, putty, fidget cube, scrunchy, beads) often used in the home or school
- Should be chosen based on child's sensory needs

What is the purpose?

- Provide organizing tactile input
- Improve focus, attention, self-regulation, and participation *(Biel, 2017)*

Evidence & Effectiveness:

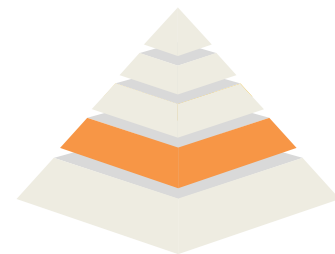
- **Level IV evidence**
 - Fidget spinners did not improve auditory attending in children with ASD *(Cihon et al, 2020)*

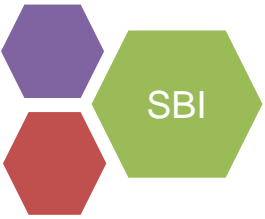


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Photo from Little Bins for Little Hands





Active SBIs: Proprioceptive Input ("Heavy" Work)

What is it?

- Input to muscles, joints, and tendons
- Receive proprioceptive input through "heavy" work (e.g., pushing, pulling, climbing)

What is the purpose?

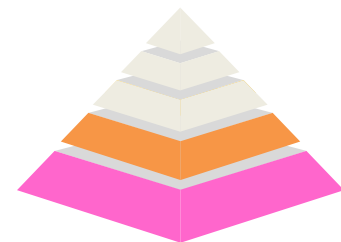
- Improve internal sense of force & pressure
- Internalize where body is in space
- Calm, alert, and/or organize behavior

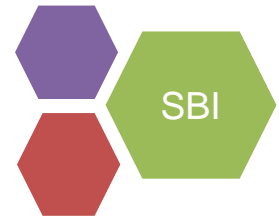
Evidence & Effectiveness:

- **Level IV & Level V evidence**
 - "Heavy" work improved on-task behavior and decreased unnecessary verbalizations in children with ASD (*Lusic, 2010*)
 - Per parent report, "heavy" work increased focus, attention, and decreased stimming behaviors (*Peña & Ripat, et al., 2021*)



Photo from Integrated Learning Strategies (ILS) Center





Sensory Schedules

What is it?

- Schedule of SBIs specifically embedded into child's daily routine
 - Based on child's sensory needs
 - Prescribed by an OT
 - Sensory not cognitive

What is the purpose?

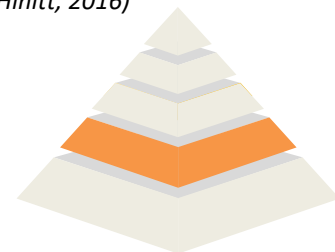
- Provide sensory input in various contexts throughout the day
- Regulate attention and arousal level

Evidence & Effectiveness:

- **Level IV evidence**
 - Facilitated classroom participation and decreased problem behaviors *(Pingale et al., 2019; Pingale, 2021)*
 - Improved sensory processing, emotional understanding and self-awareness *(Barnsley, 2021)*
 - Facilitated improvements in performance of classroom tasks *(Mills, Chapparo, & Hinitt, 2016)*



Photo by Jenn from Monster Milestones



SBI

Sensory Schedules: Example

Time	Activity	SBI
7:30-8:00am	Breakfast	Eat crunchy or chewy foods for breakfast (e.g., waffle, granola)
8:30-9:00am	Before circle time	“Heavy work” (e.g., hold door open for classmates, pick up books and put back on shelf)
10:00-10:30am	During reading	Sit & bounce on therapy ball
10:30-10:45am	During recess	“Heavy work” (e.g., 20 wall push-ups, swing, or climb on playground)
11:00-11:10am	Walking from classroom to library	Wear backpack with books; push computer cart
3:00-3:30pm	After school homework time	Alternative seating (e.g., standing up, propped up on elbows for reading)
7:30-8:00pm	Before bed	Calming sensations (e.g., take a warm bath, listen to soft, rhythmic music, diffuse lavender oil)



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Cermak et al., 2016

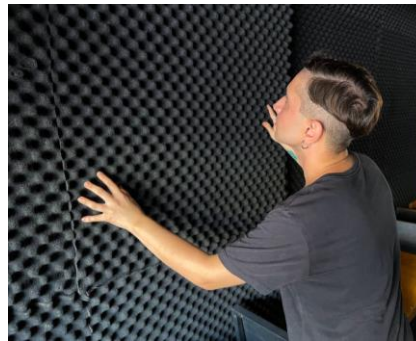


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Sensory Environmental Modifications



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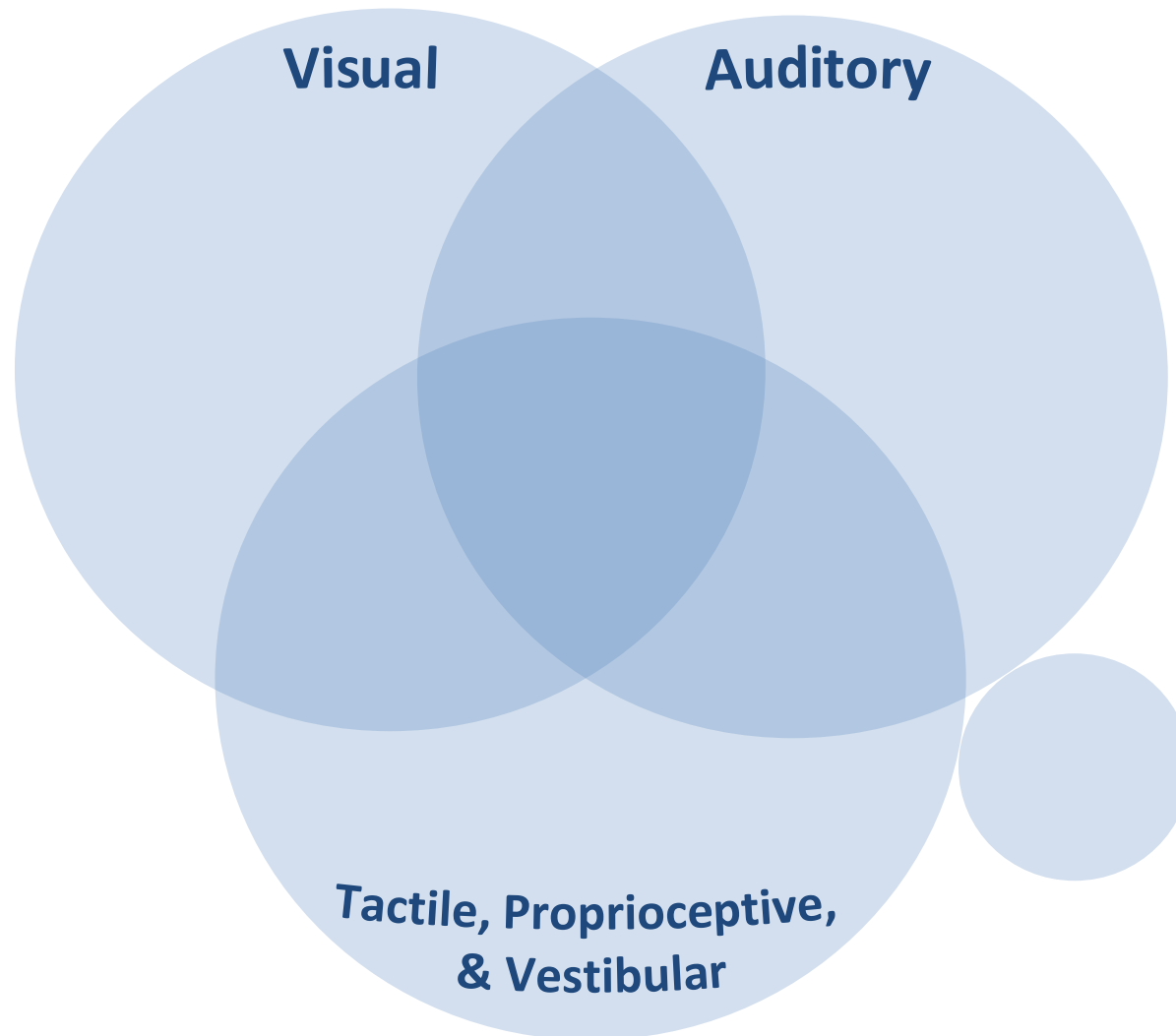
Sensory Environmental Modifications

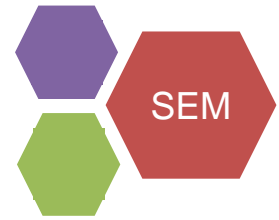
Changes to the physical space to optimize engagement and participation.

- Adapting the environment, rather than the activity
- Support sensory modulation & self regulation
- Could include reducing aversive stimuli or adding opportunities for more sensory stimulation (or both!)

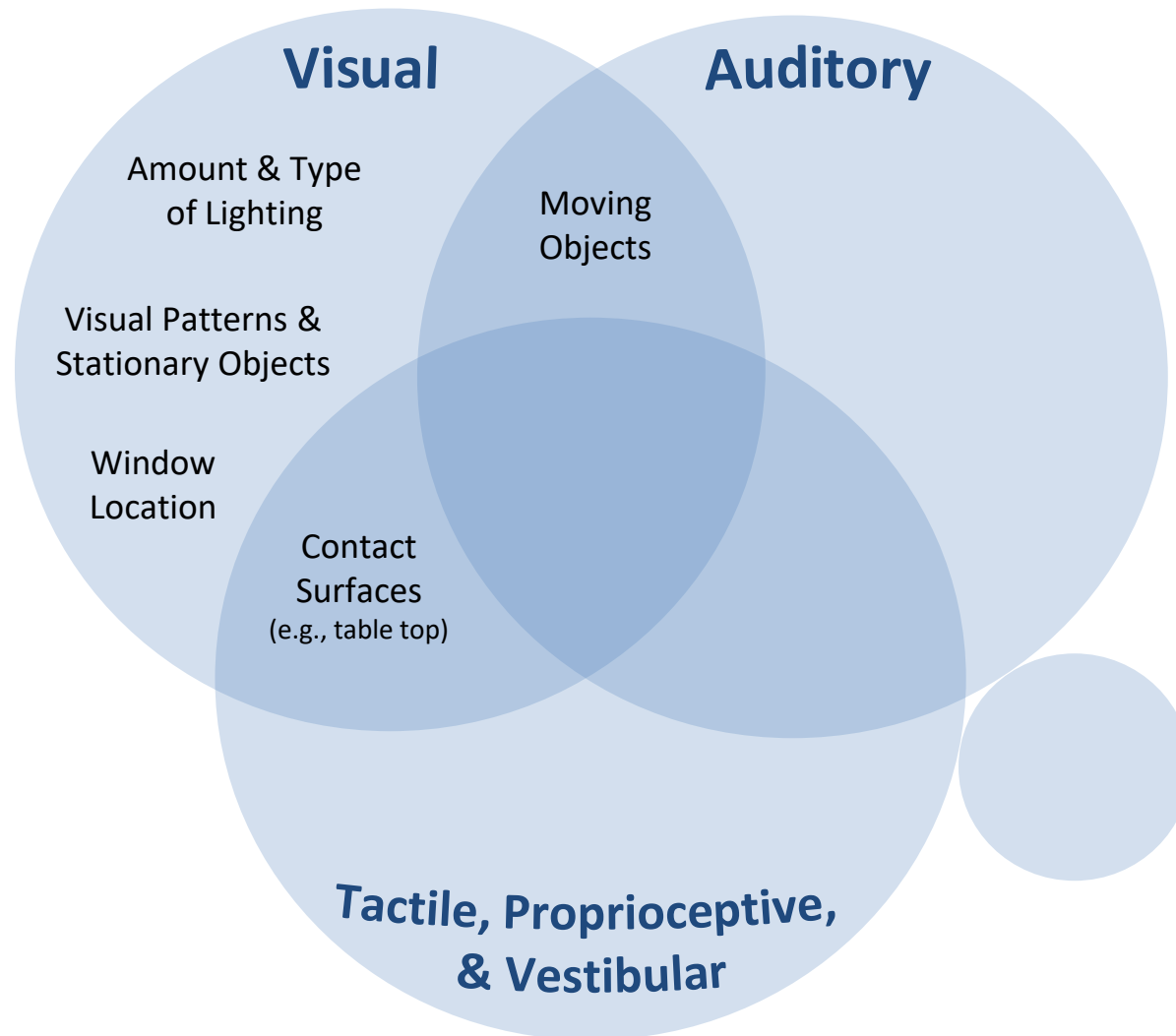


Elements of the Sensory Environment to Consider



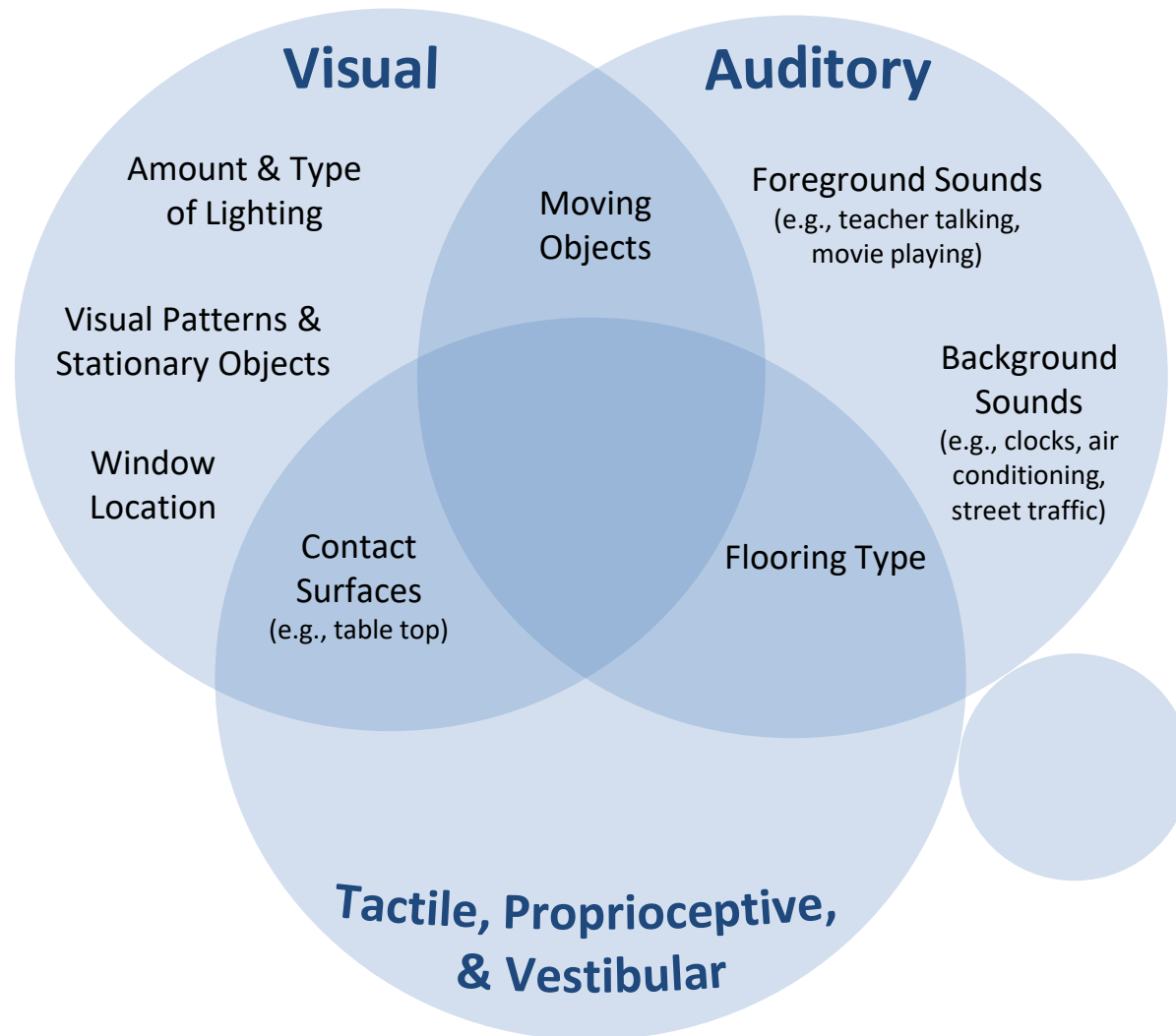


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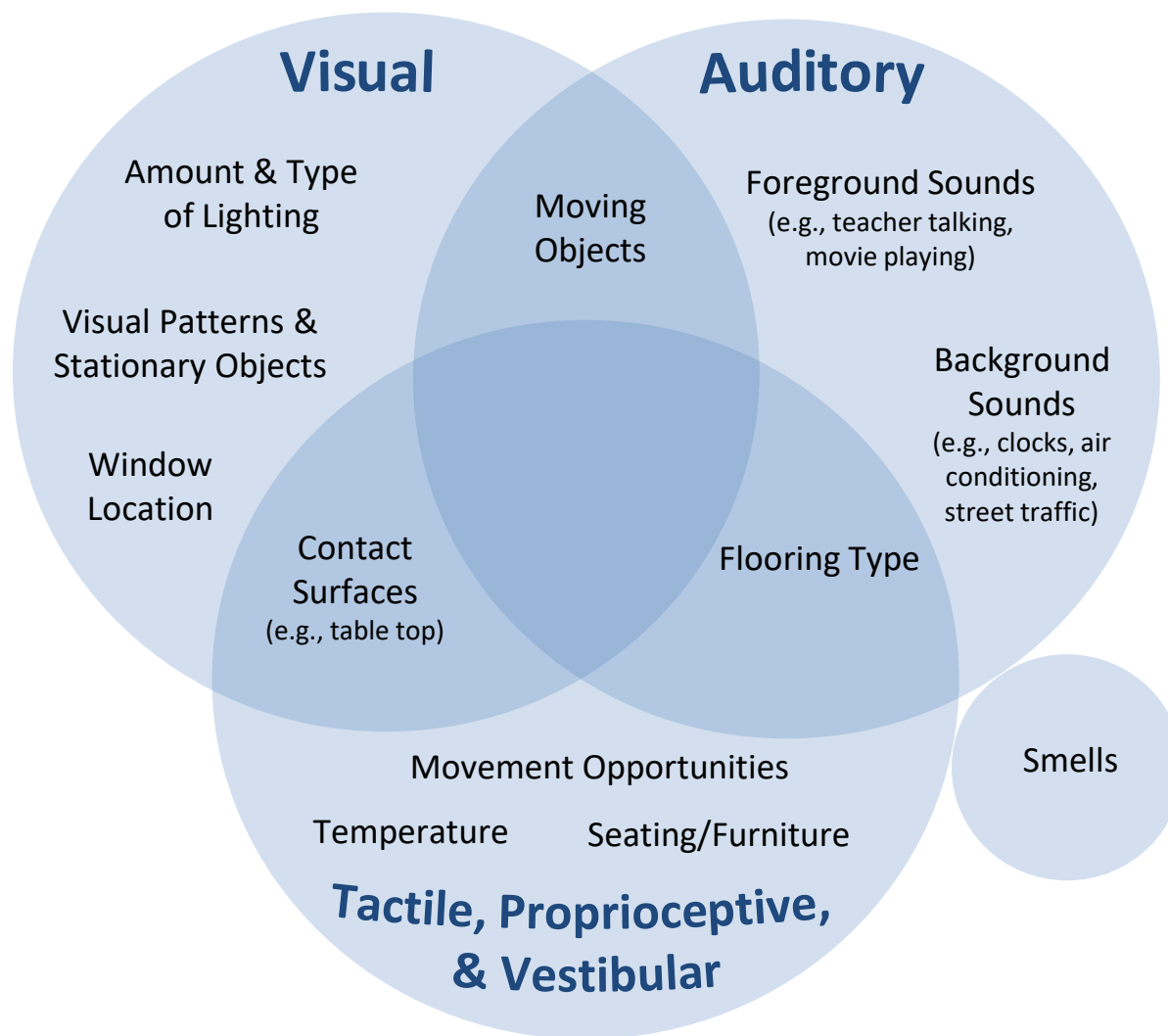


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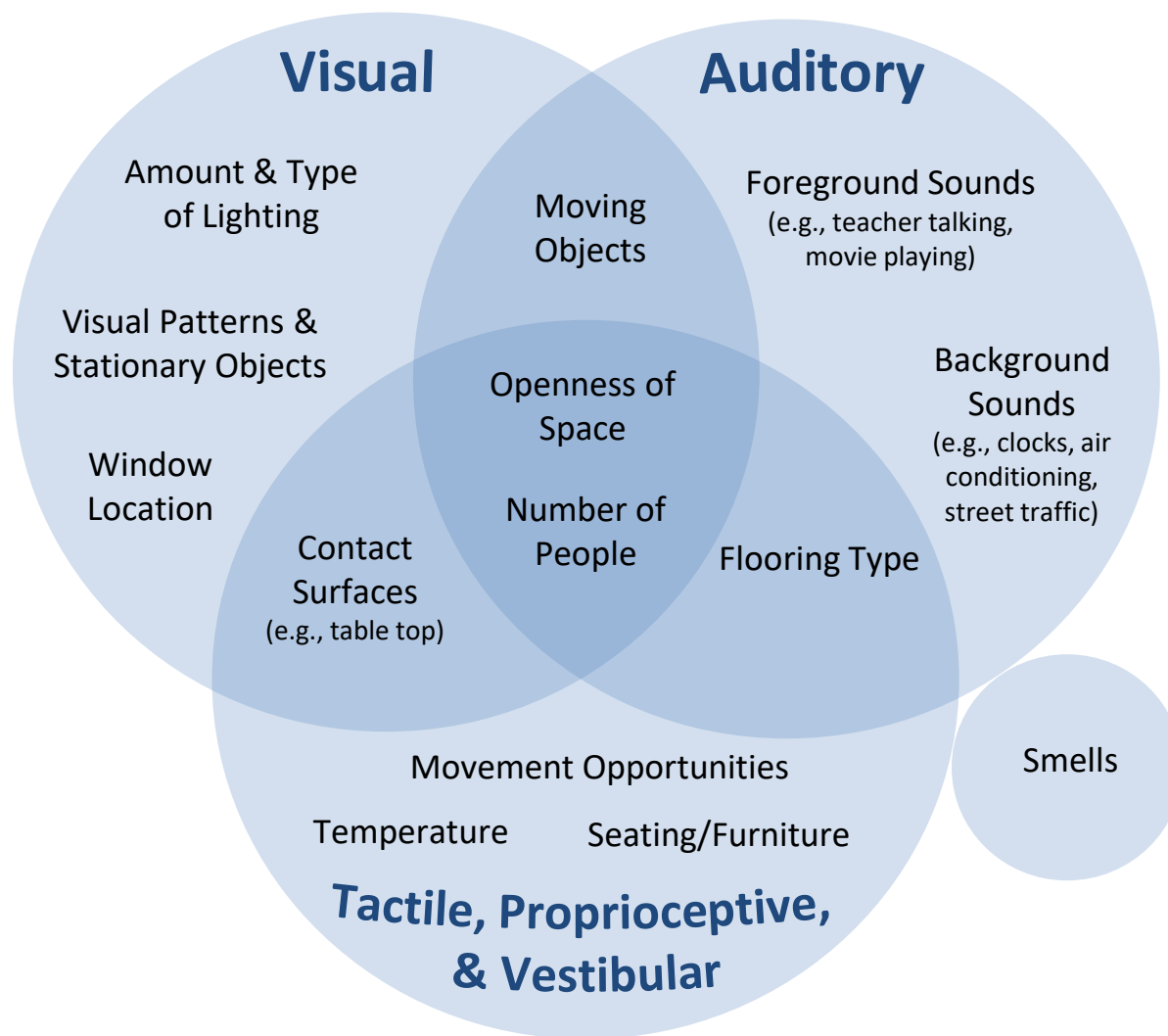


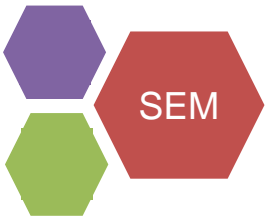
Elements of the Sensory Environment to Consider





Elements of the Sensory Environment to Consider





Sensory Environmental Modifications in the Home

Can be highly individualized

Visual

- Lamps or dimmed overhead lights
- Desk near window for natural light
- Solid color walls vs. patterned wallpaper

Tactile, Proprioceptive, & Vestibular

- Adjustable standing desk/table
- “Crash Pad” corner with beanbags, pillows, cushions, etc.
- Cushioned bathmat in bathtub

Auditory

- Digital vs. analog clocks
- Soft instrumental music playing during non-preferred tasks
- Carpet or rugs to absorb sound

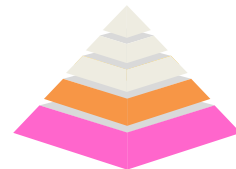
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Sensory Environmental Modifications in the Classroom

Broad range of options + reduction of common adverse stimuli

Visual

- Minimal items on walls
- Curtain covering up bookcases
- Halogen vs. fluorescent lights (Kinnealey et al., 2012)

Tactile, Proprioceptive, & Vestibular

- Work surfaces at different heights
- Variety of seating options (e.g. rocking chairs, therapy balls)
- Sensory rooms (Piller & Pfeiffer, 2016)

Auditory

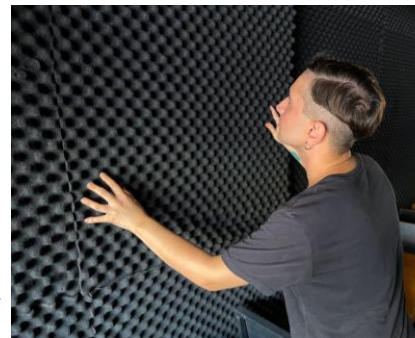
- Acoustic wall or ceiling paneling (Kinnealey et al., 2012)
- Other sound-dampening materials (e.g. rugs, curtains)
- Furniture arranged to create quiet corner



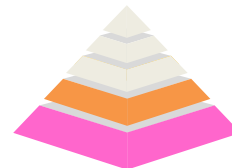
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Sensory Environmental Modifications in the **Community**

Broad range of supports + specialized experiences

Resources incorporated into 'Business as Usual':

- Sensory maps
- Social narratives highlighting the sensory environment
- Sensory break spaces (reduced stimuli)

Special Events

(Sensory-Friendly Saturdays or Relaxed Performances):

- Reduced, restricted admission resulting in smaller crowds
- Speaker volume reduced
- Balanced lighting
- Sensory break spaces
- Relaxed social expectations



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~ Research Highlight ~

Sensory Adapted Dental Environments

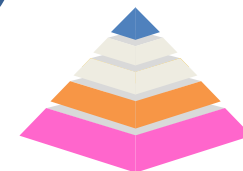
(Cermak et al., 2016)

Dental clinics featuring:

- Dark/dim lighting
- Calming music
- Slow moving image projection
- Deep pressure from a "butterfly" wrap



Cermak et al., 2016



Other Environmental Considerations

- **Access** to & **Acceptability** of sensory strategies
- **Capacity** & **Support** for sensory environmental modification
- **Attitudes** of **inclusivity**





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Communicating about Sensory-Based Interventions with an Interdisciplinary Team





Why Track Data in Practice?

- Useful in team communication
- Evidence for the match or mismatch between a child's needs and an intervention
- Structure and credibility to documentation
- Opportunities to advocate for needed services
- Can contribute to empirical research in your field
- Informs evidence-based practice



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When to Track Data in Practice

- For daily documentation and progress notes
- Before, during, and after beginning a new intervention
- Across several class periods or different days



Photo by Kuanish Reymbaev from Unsplash

Consistency is key!

How to Track Data in Practice

- Track data in the context of the intervention
- Choose what you're measuring:
 - Level of independence?
 - Frequency, intensity, impact of behavior?
- Decide who will track the data
- Determine when and for how long data will be tracked



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Data Tracking Example

Child's name:			
Target behavior:			
Person observing:			
Date:			
Time:			
Context:			
Number of times the behavior occurred:			
Average across observations:			



Data Tracking Example

Child's name: <i>Calvin</i>			
Target behavior: <i>visually distracted during work time</i>			
Person observing: <i>Teacher's aide</i>			
Date:			
Time:			
Context:			
Number of times the behavior occurred:			
Average across observations:			



Data Tracking Example

Child's name: <i>Calvin</i>			
Target behavior: <i>visually distracted during work time</i>			
Person observing: <i>Teacher's aide</i>			
Date:	<i>10/3/2021</i>		
Time:	<i>12:30-1:15pm (math lesson)</i>		
Context:	<i>Classroom</i>		
Number of times the behavior occurred:	<i> </i>		
Average across observations:			



Data Tracking Example

Child's name: Calvin			
Target behavior: Visually distracted during work time			
Person observing: Teacher's aide			
Date:	10/3/2021	10/4/2021	10/5/2021
Time:	12:30-1:15pm (math lesson)	12:30-1:15pm (math lesson)	12:30-1:15pm (math lesson)
Context:	Classroom	Classroom	Classroom
Number of times the behavior occurred:	III IIII	III III	III III
Average across observations:			9



Data Tracking Example

After Implementing the Intervention

Child's name: <i>Calvin</i>			
Target behavior: <i>visually distracted during work time</i>			
Person observing: <i>Teacher's aide</i>			
Date:	<i>10/11/2021</i>	<i>10/12/2021</i>	<i>10/13/2021</i>
Time:	<i>12:30-1:15pm (math lesson)</i>	<i>12:30-1:15pm (math lesson)</i>	<i>12:30-1:15pm (math lesson)</i>
Context:	<i>Classroom</i>	<i>Classroom</i>	<i>Classroom</i>
Number of times the behavior occurred:	<i>III</i>	<i>II</i>	<i>IIII</i>
Average across observations:			<i>3</i>



Considerations for Teams

Potential Challenges

Diverse clinical languages

Possible Solutions

- Define your terms
- Choose terms for the team to use consistently



Considerations for Teams

Potential Challenges

Diverse clinical languages

Differing perceptions of approaches

Possible Solutions

- Define your terms
- Choose terms for the team to use consistently
- Actively listen
- Communicate treatment plans openly
- Share your clinical reasoning



Considerations for Teams

Potential Challenges

Diverse clinical languages

Differing perceptions of approaches

Concerns about effectiveness

Possible Solutions

- Define your terms
- Choose terms for the team to use consistently
- Actively listen
- Communicate treatment plans openly
- Share your clinical reasoning
- Track data during your daily practice
- Partner with local universities to inform and participate in research
- Read empirical evidence



Considerations for Teams

Potential Challenges

Diverse clinical languages

Differing perceptions of approaches

Concerns about effectiveness

Mismatched expectations

Possible Solutions

- Define your terms
- Choose terms for the team to use consistently
- Actively listen
- Communicate treatment plans openly
- Share your clinical reasoning
- Track data during your daily practice
- Partner with local universities to inform and participate in research
- Read empirical evidence
- Clearly communicate boundaries
- Respect boundaries set by others
- Share preferred method of contact

Tips for Parents

- Track your own data on your child's behavior at home to share with the team
- Ask clinicians about their clinical reasoning process:
 - What research evidence is there for this intervention?
 - How are you measuring whether or not this works for my child?
 - How did you choose this treatment for my child?
- Communicate changes in your child's life:
 - Daily routine
 - Services or medications
 - Context (e.g., new school, birth of a sibling, moving to a new home)



Benefits of Effective Team Communication



Photo by Christina from Unsplash

- Improvement in child outcomes
- Comprehensive approach to service delivery
- Larger body of research evidence
- Respectful, collaborative environment that promotes cohesiveness, well-being, and satisfaction



Conclusions and Takeaways

There are many sensory approaches implemented across contexts, settings, and providers. They include Ayres Sensory Integration[®], sensory based interventions, and sensory environmental modifications.



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There are many sensory approaches implemented across contexts, settings, and providers. They include Ayres Sensory Integration[®], sensory based interventions, and sensory environmental modifications.

The research evidence for these interventions varies in rigor, so clinical expertise and other forms of evidence help inform decisions about which intervention(s) to use.



Conclusions and Takeaways

There are many sensory approaches implemented across contexts, settings, and providers. They include Ayres Sensory Integration[®], sensory based interventions, and sensory environmental modifications.

The research evidence for these interventions varies in rigor, so clinical expertise and other forms of evidence help inform decisions about which intervention(s) to use.

It is important to track data about whether an intervention is working or not and communicate with the interdisciplinary team about how clinical decisions are made.



ASD & Sensory Processing Researchers at USC Chan

- Dr. Grace Baranek & Dr. John Sideris: Innovations in Neurodevelopmental Sensory Processing Research (insp!re)
 - <https://chan.usc.edu/inspirelab/people>
- Dr. Mary Lawlor: Boundary Crossings
 - <https://chan.usc.edu/research/core/boundary-crossings>
- Dr. Bobbi Pineda: Occupational Therapy NICU Lab
 - https://chan.usc.edu/people/faculty/Bobbi_Pineda
- Dr. Amber Angell:
 - https://chan.usc.edu/people/faculty/Amber_Angell
- Dr. Sharon Cermak: Sensory Adaptations in Dental Environments
 - <https://chan.usc.edu/research/core/sade>
- Dr. Leah Stein Duker: Environmental Barriers & Facilitators for Adults with Autism Spectrum Disorder during Primary Care Health Encounters
 - https://chan.usc.edu/people/faculty/Leah_Stein_Duker
- Dr. Lisa Aziz-Zadeh: The Relationship Between Brain Functioning, Behavior, and Microbiota in Autism Spectrum Disorder; A-Z Lab
 - <https://chan.usc.edu/research/core/social-cognitive-neuroscience>



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Please visit us at
<https://chan.usc.edu/inspirelab!>



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