



Ayres Sensory Integration® (ASI)

March 1, 2022

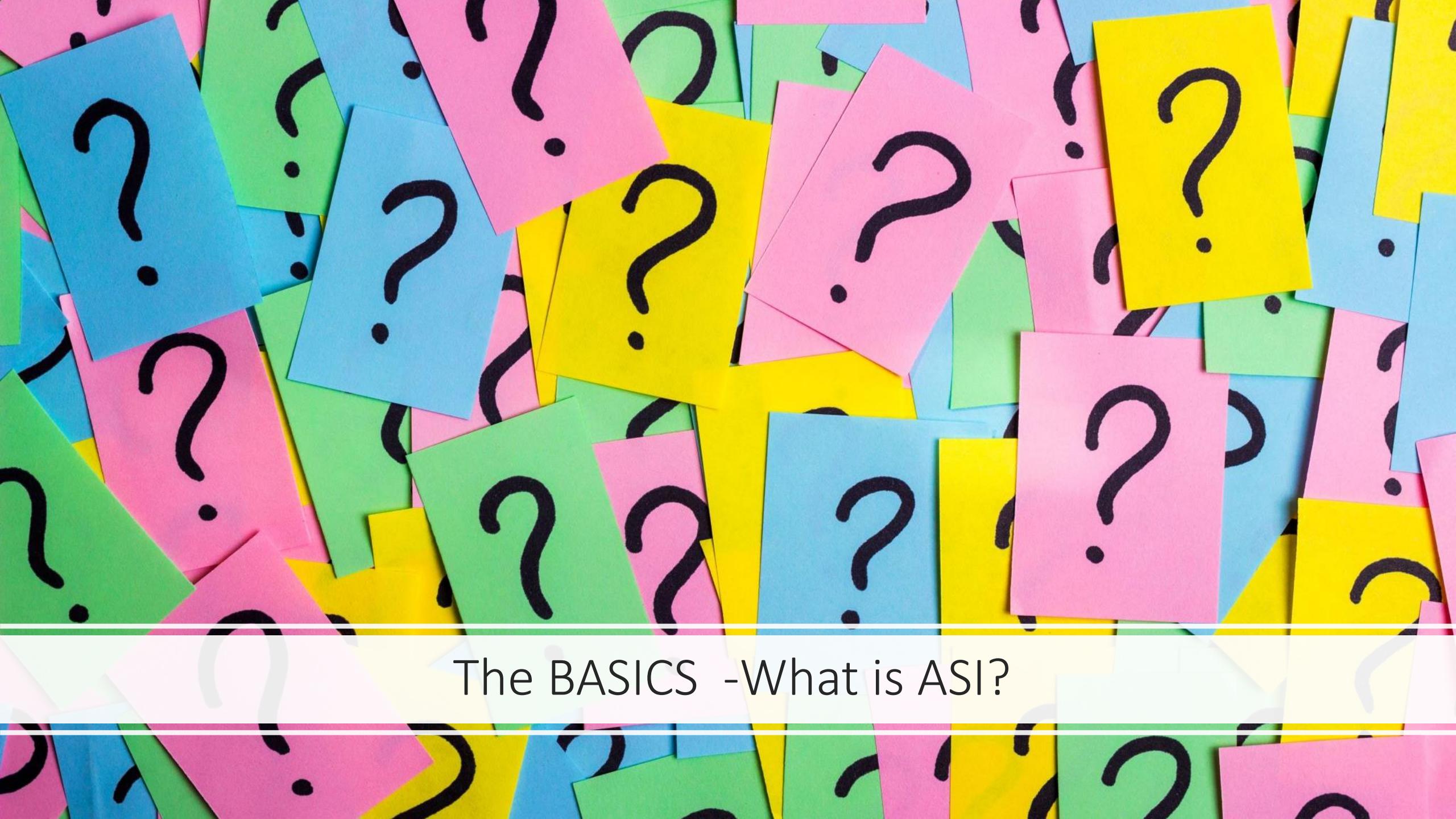
UNC Frank Porter Graham Child
Development Institute



Autism Focused Intervention
Resources & Modules

Overview

1. **Basics of SI** (Lesson 1): Describes ASI and how it can be used with learners with autism, as well as who can use the ASI and its evidence-base from the 2020 NCAEP EBP Report (Steinbrenner et al., 2020).
2. **Planning for SI** (Lesson 2): Provides concrete steps and examples of how to plan for using ASI.
3. **Using SI** (Lesson 3): Provides concrete steps and scenarios of how practitioners and family members can use principles of ASI.
4. **Monitoring SI** (Lesson 4): Provides steps for monitoring the use of ASI, such as collecting data and determining next steps for the learner with autism.
5. **Resources and Tools**: Free downloadable resources and tools to support use of ASI.

The background of the slide consists of a dense pile of various colored sticky notes (pink, yellow, blue, green) scattered across the frame. Each note features a large, bold black question mark printed on it, symbolizing inquiry or uncertainty.

The BASICS -What is ASI?

Terminology

- Ayres Sensory Integration (SI) (Ayres, 2005), has also been referred to in the literature as
 - “Sensory Integration therapy as originated by A. Jean Ayres,”
 - “classical sensory integration,”
 - “Ayres Sensory Integration.”
- We will use “**ASI**” throughout this module to refer to these models of sensory integration that are supported by the systematic review (Steinbrenner et al., 2020).

Disclaimer

The evidence base at this time only supports **Ayres Sensory Integration**.

Ayres Sensory Integration requires specialized training with a certified provider to implement with fidelity. This training is most commonly completed by Occupational Therapists and, in some cases, other licensed therapists.

This module is not intended to replace training in SI or ASI and the certification process, but rather, to introduce basic knowledge of ASI as an evidence-based practice for learners with autism.



What is ASI?

- A. Jean Ayres developed the sensory integration theory and practice.
- ASI targets a learner's ability to process and internally integrate sensory information from their body and the environment.
- ASI individually tailors activities that utilize "just right" challenges to a learner's existing patterns of sensory processing and motor planning and encourage movement and organization of self in time and space.
- ASI incorporates specialized equipment and materials in purposeful and playful activities in order to improve target skills.

A "**just right challenge**" is a therapeutic sensory-motor task that meets the learner at their present skill level and pushes them exactly enough to achieve, or become incrementally closer to achieving, the next skill level, while keeping the interaction fun and engaging.

ASI Principles (Ayres, 2005)

- Active engagement of the student
- Naturalistic intervention approaches for arousal, attention, motor planning including
- arrangement of the intervention environment
- Individualized treatment that is one-on-one with a trained therapist
- Clinic-based services
- Time intensity - usually multiple treatment sessions within a week
- Treatment delivered by occupational therapists who are trained in this approach
- Treatment of students with autism who have clinically significant sensory processing dysfunction.



Basic Information - ASI

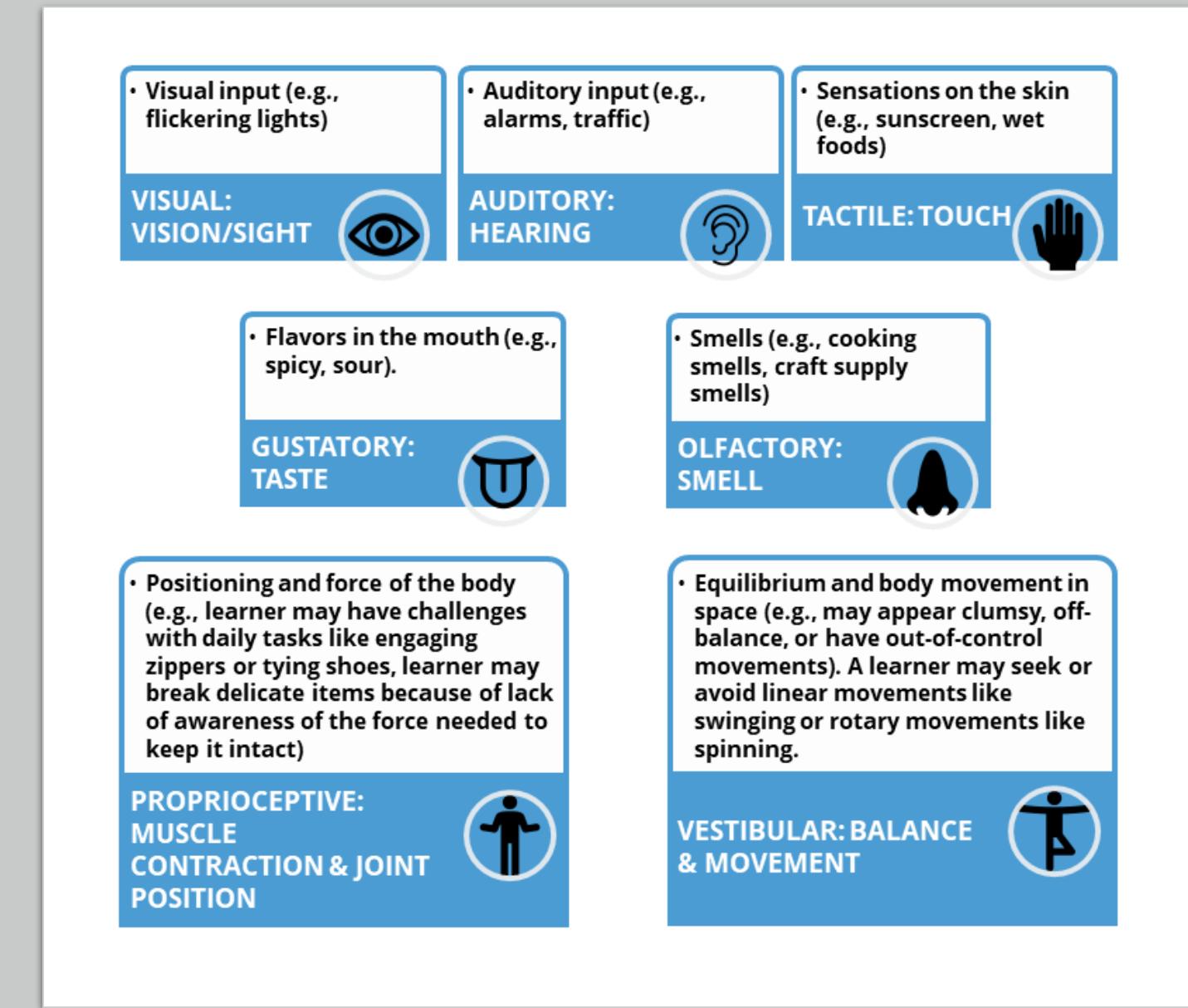
- ASI is implemented by therapists ***with specialized training***, usually occupational therapists (OT)
 - Not all OTs can implement ASI!
- Takes place in ***specially designed clinical settings*** that offers a safe and sensory-rich experience.
 - In some rare instances, ASI can be used in school settings *when the school OT has SI training and specific space and equipment is available* in the school.
 - It is also possible that, *in consultation with a trained OT*, ASI recommendations and planned activities may be integrated into the classroom.

Sensory Information

This is in the module Brief Packet

QUICK TIP:

- For more extensive examples of ASI challenges by modality, see the following Sensory Integration Global Network resource:
<https://www.siglobalnetwork.org/3-parents-resources-page-3>



Question:
About how many learners with autism have difficulty processing and modulating sensory stimuli?

Answer choices:

Most of them, 71-100%

Many of them, 51-70%

Some of them, 31-50%

Few of them, 0-30%

Question:

About how many learners with autism have difficulty processing and modulating sensory stimuli?

Answer choices:

- Most of them, 71-100%
- Many of them, 51-70%
- Some of them, 31-50%
- Few of them, 0-30%

Feedback:

About 56% to 70% of learners with autism are estimated to have sensory processing challenges.²⁻³ About 5% to 16% of the total school-aged learner population are reported to have difficulties processing and integrating sensations.⁴⁻⁵

What is NOT ASI?

ASI has been used to refer to a number of sensory-based intervention approaches in research and clinical practice. ***So how do you know what is or is not ASI?***

The following intervention approaches may be confused with ASI but have insufficient evidence and should NOT be considered ASI when used in isolation outside of a comprehensive ASI therapy plan:

- Use of specific equipment for passive stimulation like brushing protocols, swings, weighted vests, squeeze machines, and weighted blankets
- Sensory diets
- Use of a sensory gym
- Touch therapy
- Sensory-motor intervention
- Auditory Integration Therapy



ASI Goals

All students need to successfully process and modulate sensory input throughout their day in order to participate in daily activities, including those at school. ASI therapy may help children deal with sensory challenges, when they are present, that may lead to improvement in other goals

The research literature suggests that such improvements may be seen in:

- Motor skills⁶⁻⁷
- Adaptive skills
 - Improve independence with self-care (e.g., feeding, hand washing, toileting)⁸
- Cognition
 - Executive functioning including cognitive flexibility, planning, and working memory⁶
- Communication skills⁶
- Social skills^{6-7, 9}
- Academic/pre-academic skills⁸⁻⁹
- Reduction in interfering behaviors
 - Repetitive behaviors, repetitive motor movements⁶⁻⁷

Do all learners with autism need ASI?

- Everyone has some preferences and differences in their processing of sensations!
- It is only when sensory processing ***interferes with the learner's functioning in daily activities*** (what therapists call “activities of daily living” or ADLs) ***or achievement of their goals*** that intervention is needed.

How can ASI help learners?

Sensory processing challenges can be distracting and overwhelming to learners. For this reason, learners who struggle with processing sensory information may be limited in their ability to:

- engage and attend to tasks
- complete coordinated motor movements
- perform self-care tasks
- plan and sequence new tasks
- regulate their emotions
- follow classroom expectations
- and communicate and socialize within their relationships with others.



Learner Perspective – Imagine you are...

- Trying to complete an important test while someone flicks the lights on and off constantly.
- Trying to introduce yourself to a new work colleague while fighting nausea from a hot dumpster smell right next to you.
- Trying to remember everything on your grocery list with an emergency siren blaring next to you in the store.
- Spinning around in circles for two minutes and then attempting to dress yourself for the day.

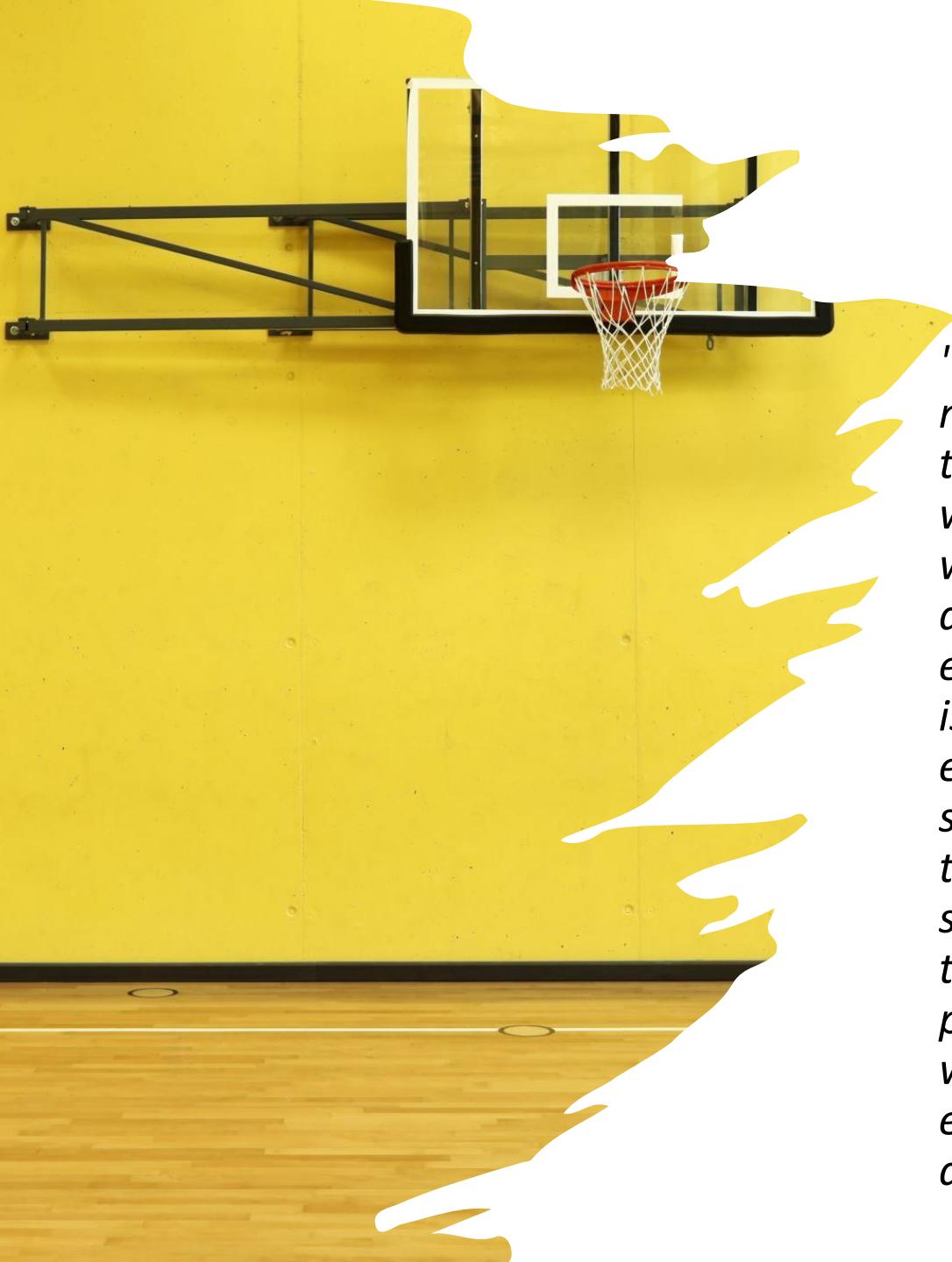
- These scenarios may make you feel dysregulated, out-of-control, anxious, or induce fight-flight-freeze responses like yelling at someone, running away, becoming non-responsive, or throwing up. Similarly, learners with autism may experience these feelings during daily activities.
- ASI can help learners regulate their bodies and process sensory information so that they can complete daily activities. Learners may benefit from ASI to support fine and gross motor skills, adaptive skills, communication and socialization skills, and emotion regulation.

Scenario - Teacher

“Marcus came to my preschool class with a new diagnosis of autism. His parents were completely overwhelmed because Marcus wasn’t sleeping at night. The slightest noise in their house woke him up. His auditory sensitivity was also a problem at school. The air conditioning turning on made him run into a corner and cover his ears. He played alone and avoided most activities and other kids. If there was an unexpected noise, he would have a complete meltdown and bite himself on the arms. I knew that sensory integration may help Marcus and suggested his parents talk to his pediatrician. The pediatrician referred him for an evaluation by a certified OT to address the issues at home. Marcus started receiving ASI from a trained OT. The OT was able to help his parents and us at school. The OT met with us and guided us on how to use some of the strategies in the classroom to help Marcus stop hurting himself and participate at school.”



Image Source: Creative Commons



Scenario - OT

"As an OT in a middle school, I wasn't sure that I needed sensory integration training. Though ASI therapy is provided in a specialized clinic setting, I was getting lots of kids with autism on my caseload with issues in emotion regulation, motor planning, and interfering behaviors. Unfortunately, their emotional and behavioral outbursts around sensory issues were leading to disciplinary referrals and expulsions. I decided to get ASI training to better support these middle schoolers. I use an ASI approach to modify the school environment for individual student sensory needs. The echo in the gym seemed to be especially hard for some kids, so we started providing a quiet space in one of the coach's offices where kids could take a break. I can also better educate my colleagues to reduce disciplinary referrals and promote the success of our students."

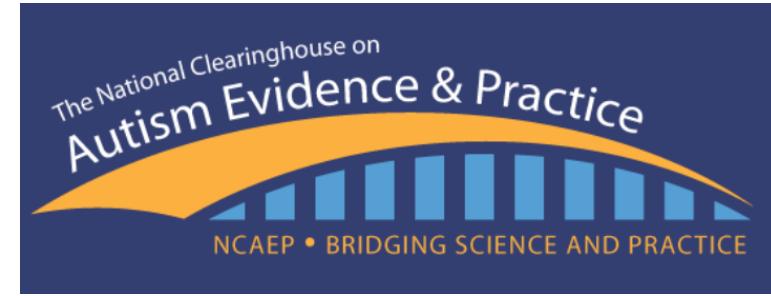
Scenario - Parent



Source: Creative Commons

"Carmen was 6 when she was diagnosed with autism. The doctors said it was Sensory Processing Disorder before that because many of her symptoms were around sensory issues. Carmen hated the smell and feel of most foods. She gagged and vomited at mealtimes starting when she was a baby, and we introduced solid foods. Daycare and school meals were challenging, and Carmen had to eat her food from home in a separate room from the other kids. We couldn't go anywhere that there may be food smells for fear she would throw up or have a meltdown suddenly. It really restricted our social life and hers. Once we started seeing an OT for Ayres Sensory Integration® therapy, Carmen's behavior around food started to improve. We've worked on gradually increasing her tolerance for the smell and feel of food. She doesn't throw up anymore and can eat in a small lunch bunch group at school. It has made a big difference for her."

Evidence for ASI



The National Clearinghouse on Autism Evidence and Practice (NCAEP) reviewed literature from 1990 to 2017 and reported their findings in 2020.¹⁰

ASI is a focused intervention that meets the evidence-based practice criteria with **3 group design studies**. This practice has been effective for preschoolers (3-5 years), elementary school learners (6-11 years), and middle school learners with autism.

Studies included in the 2020 EBP report¹⁰ detail how this practice can be used to effectively address the following outcomes for a target goal/behavior/skill: academic/pre-academic, adaptive/self-help, challenging/interfering behavior, cognitive, communication, motor, and social.

#Content

PLAN for ASI



ASI Training

ASI requires training from certified providers. The University of Southern California, where A. Jean Ayre's developed Sensory Integration, offers an in-person and online continuing education certificate program in ASI: <https://chan.usc.edu/academics/continuing-education/sensory-integration>

The USC program is presently the only certification program recommended by the American Occupational Therapy Association. Clinicians who are not licensed Occupational Therapists may need additional documentation of their credentials in order to complete the program.

In addition, researchers at Thomas Jefferson University have manualized Ayres Sensory Integration using rigorous methods: *Clinician's Guide for Implementing Ayres Sensory Integration: Promoting Participation for Children with Autism.*¹¹⁻¹²

Determine a Learner's Sensory Needs

If you have concerns about a learner's sensory needs, conducting an assessment can help you determine the learner's current sensory processing level as well as specific areas of need that the learner may have. This information may be used as part of a referral to a trained OT or as part of an ASI assessment conducted by a trained OT.

SIGNS A STUDENT MAY BENEFIT FROM AN ASI ASSESSMENT:				
1.	Is the learner distracted by sensory stimuli in a way that intrudes with their academic goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
2.	Is the learner showing challenging behaviors in response to sensory stimuli?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3.	Does the learner seek certain sensory input in a way that interferes with their academic or social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
4.	Does the learner avoid certain age-appropriate activities due to suspected sensory issues?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
5.	Is the learner distracted by sensory stimuli in a way that intrudes with social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Collect Observational Data

OBSERVATIONAL DATA:			
Time	Activity	Sensory Input	Behavior Observed
7am	Bus drop off	Bus honks horn as it drives away	Student covers ears and hums to self while coming off of the bus in anticipation of the horn honking that occurs as the bus drives away.
9:30am	Gym	Seated scooter races	Student smiles and squeals in delight with other kids while racing on the scooters.
11am	Music	Recorder practice	Student is fine when individual recorders play but covers ears and goes to the corner when the class plays together.
12pm	Lunch	Smells, noises	Student puts on headphones, quickly carries lunch box across cafeteria to sit outside at table alone.
1pm	Silent Reading	Bean bag	Student wiggles and curls up in bean bag with book about airplanes during silent reading.
1:30pm	Math	Counting blocks	Student engages with counting blocks for 5 minutes. Gets wiggly and almost falls out of chair rocking it back as far as it will go.

ASI Assessment

- An ASI Assessment from a certified provider, usually an OT, has several components developed by A. Jean Ayres.
- **This is what that process may involve for a learner:**
 - Observation of the learner in natural settings
 - Parent and teacher interviews
 - Standardized testing
 - Structured observations of the learner in a clinical setting with various sensory stimuli

The *Sensory Integration and Praxis Tests* (SIPT; Ayres, 1989) is a battery of 17 standardized tests that contributed to the development of ASI theory and has been used to determine aspects of sensory processing and integration that are challenging for learners between 4 and 8 years old. The SIPT has been considered the “gold standard” for assessing sensory integration and praxis issues using norm-referenced scores (AOTA, 2008; Shaaf & Smith Roley, 2006). During the last 30 years other standardized tests and parent surveys have been developed to identify sensory processing disorders.



Other support staff, like classroom teachers who are ineligible to receive formal ASI training, may support the ASI assessment process by contributing valuable information such as:

- Referring/recommending an ASI assessment (see **When to refer a learner for an OT assessment related to ASI** on the previous page)
- Knowledge of the learner's family's concerns about sensory issues
- Observing and reporting on the student's sensory responses across the school day (see **Observational data example** on the previous page)
- Knowledge of classroom routines where ASI may be beneficial to try
- Understanding of the student's preferences and what motivates them during the day
- Student goal development and feasibility of implementing those goals in the classroom context

Develop an ASI Session Plan



ASI involves an individualized treatment program and is always completed ***one-on-one with a learner and trained ASI therapist.*** This means that sessions occur at a set clinical meeting place on a schedule.

ASI treatment sessions may occur more often (at a higher intensity) than typical therapy sessions, often meeting at least 2 times per week.

Key components of an ASI treatment session must be pre-planned to include:

- Sensory opportunities promoting optimal adaptive behavior as well as physical and emotional safety for the learner. Sensory opportunities may be:
 - tactile (different textured items to touch and explore)
 - proprioceptive (pushing or pulling toys, heavy lifting activities, obstacle courses that include heavy equipment)
 - vestibular (balance beams, swings, trampolines, or other playground equipment that provides intense movement)
- Sensory-motor activities and sensory experiences designed to meet the learner at their current adaptive level and also challenge them to move one step further
- Activities that are motivating for the learner to attempt themselves with support from the therapist
- Activities that will challenge the learner to successfully make a plan and carry out that plan
- Activities that will address postural control and balance using specialized equipment (AOTA, 2008; Parham et al., 2007)

The following additional principles are deemed essential to the delivery of intervention using an ASI approach

- ensuring physical safety,
- collaborates in activity choice, and
- supports child's intrinsic motivation to play.¹⁷



Identify Additional EBPs

During ASI therapy, it is helpful to use additional foundational evidence-based practices. These practices help practitioners provide support for learners during the session.

- Modeling (MD) - In an ASI therapy session, the therapist may model a new sensory experience or a sensation. Modeling may also be helpful for a sensory experience that has been tolerated in therapy but not yet in the classroom. This can be done live by a teacher or student.
- Social Narratives (SN) - You may plan to use social narratives to prepare the learner for situations with new sensory stimuli.
- Task Analysis (TA) - Task analysis may help with establishing and executing a multi-step activity.
- Video Modeling (VM) - Some learners may also like to watch themselves or other students model using a video model.
- Visual Supports (VS) - Some learners may need visual supports or visual schedules to guide them through an ASI session or prepare them for sensory experiences coming up in their day.



Reinforcement in ASI

ASI uses **natural reinforcers** in sessions to promote the learner's intrinsic motivation to play. This means that activities are designed to be naturally interesting and motivating to the learner and completion of those activities is rewarded naturally rather than with tangible rewards.

For example, a learner who likes Minecraft may be naturally motivated and rewarded to complete a Minecraft-themed obstacle course with similar components as the game.

Discuss Plan with Team Members

All members of the learner's school team, including family members, will need to understand the learner's sensory processing challenges and how to implement ASI strategies (if appropriate).

The learner's trained occupational therapist may:

- Provide some basic training on types of sensory modalities and how these sensory processing issues impact the learner
- Make sure that team members understand that many interfering behaviors are responses to the sensory stimuli and are not appropriate for disciplinary measures
- Discuss the ASI strategies that the team will use to support the learner in the school setting (if appropriate)
- Plan for unexpected sensory events and how to keep the learner and other students safe in these instances



Team Planning Considerations

If the learner's peers are affected by the learner's sensory needs or behaviors, or if peers ask questions about sensory strategies in the classroom (e.g., if they see additional supports like a wiggle seat cushion and ask questions), provide some age-appropriate education and awareness training for them as well.

Whenever possible, include the learner as a leader of their own support team. Help them determine what information they want (or do not want!) shared about their sensory experiences with others, and provide choices about supports, activities, and behavior plans. When this is not possible, make sure that family members are leading contributors on the team.



Have
Materials
Ready

---Planning Checklist---

EBP



Learner's Name: _____ Date/Time: _____

Observer(s): _____

Target Goal/Behavior/Skill (short): _____

Directions: Complete this checklist to determine if this is an appropriate practice to use with the learner with autism as well as if this practice is ready to be implemented.

GENERAL PLANNING:

1. Has the target goal/behavior/skill been identified?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
2. Has baseline data and/or a functional behavior assessment been collected through direct observation of the learner?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
3. Is the target goal/behavior/skill measurable and observable? Does it clearly state what the target goal/behavior/skill is, when it will occur, and how team members/observers will know it has been mastered?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
4. Is this selected practice appropriate for the learner's target goal/behavior/skill?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Does the learner have needed prerequisite skills/abilities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
6. Does the learner require additional adaptations/modifications/supports? Such as visual supports or a communication device?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
7. Have reinforcers/rewards for the learner been identified based on the learner's interests/preferrred items and/or activities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
8. Are additional materials and/or resources for using this selected practice ready and available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

TARGET GOAL/BEHAVIOR/SKILL:

Planning Activity

Ravi is a student in Ms. Mitchell's second grade classroom. He has difficulty focusing during class instruction and during independent work. He frequently runs from his desk near the window and buries himself in the bean bag chair in the reading corner of the classroom. He also hums, sometimes loudly, in response to certain sounds that he hears. Ms. Mitchell is confident that Ravi is able to comprehend the lessons, but his distractibility and interfering behaviors are impacting his academic progress.

Use the checklist to determine Ravi's needs:

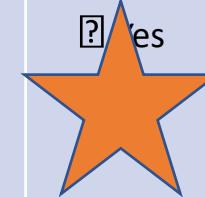
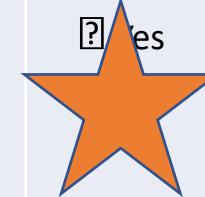
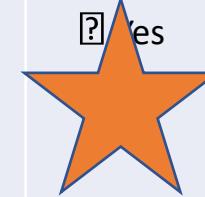
SIGNS A STUDENT MAY BENEFIT FROM AN ASI ASSESSMENT:

1.	Is the learner distracted by sensory stimuli in a way that intrudes with their academic goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
2.	Is the learner showing challenging behaviors in response to sensory stimuli?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3.	Does the learner seek certain sensory input in a way that interferes with their academic or social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
4.	Does the learner avoid certain age-appropriate activities due to suspected sensory issues?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
5.	Is the learner distracted by sensory stimuli in a way that intrudes with social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Ravi

Feedback: Ravi seems to be distracted by certain auditory stimuli in a way that interferes with his academic work in that he has difficulty focusing and completing schoolwork. Challenging behaviors include frequently running from his seat, and his humming is disruptive to the class. He avoids classwork because of his hypersensitivity to sounds in the classroom. Based on this checklist, Ravi may benefit from an ASI assessment.

SIGNS A STUDENT MAY BENEFIT FROM AN ASI ASSESSMENT:

1.	Is the learner distracted by sensory stimuli in a way that intrudes with their academic goals?	<input type="checkbox"/> Yes 	<input type="checkbox"/> No	
2.	Is the learner showing challenging behaviors in response to sensory stimuli?	<input type="checkbox"/> Yes 	<input type="checkbox"/> No	
3.	Does the learner seek certain sensory input in a way that interferes with their academic or social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
4.	Does the learner avoid certain age-appropriate activities due to suspected sensory issues?	<input type="checkbox"/> Yes 	<input type="checkbox"/> No	
5.	Is the learner distracted by sensory stimuli in a way that intrudes with social goals?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Ms. Mitchell's Observational Data

OBSERVATIONAL DATA:			
Time	Activity	Sensory Input	Behavior Observed
7:30am	Morning work	Beep from the intercom	Ran from desk to bean bag chair, head down in the bag and humming
9:15am	Math independent work	Using manipulatives (counting chips)	Unable to complete work, kept watching peers playing with the counting chips, lots of fidgeting in his seat
10am	ELA lesson	See and hear children playing outside	Covered his ears and hummed loudly
11:10am	Gym	Basketball	Did not participate, spent most of the class on the bleachers, lots of rocking and humming
12pm	Lunch	Loud talking	Ate lunch quickly then became anxious, ready to go outside, some pacing in the corner of the cafeteria
1pm	Reading	Bean bag	Sat comfortably, read his book for the entire reading period
1:45pm	Science	See and hear children playing outside	Covering his ears, humming, ran to the bean bag twice during the lesson



Select a goal for Ravi

From the observational data provided by Ms. Mitchell and from the ASI assessment, the OT learned that loud, sudden, and unexpected noises are particularly interfering for Ravi. He is, however, able to focus and complete work tasks in quiet environments. Given this information, help Ravi's team select an annual goal for Ravi. Select the best goal for Ravi.

- At school Ravi will complete assignments daily.
- With the support of noise cancelling headphones, during independent work time in the classroom, Ravi will engage in independent work for 15 minutes in 4 of 5 opportunities in a week.
- Ravi will stay in his seat during class.
- During recess, Ravi will interact with his peers daily.

Goal for Ravi

From the observational data provided by Ms. Mitchell and from the ASI assessment, the OT learned that loud, sudden, and unexpected noises are particularly interfering for Ravi. He is, however, able to focus and complete work tasks in quiet environments. Given this information, help Ravi's team select an annual goal for Ravi. Select the best goal for Ravi.

- At school Ravi will complete assignments daily.
- **With the support of noise cancelling headphones, during independent work time in the classroom, Ravi will engage in independent work for 15 minutes in 4 of 5 opportunities in a week.**
- Ravi will stay in his seat during class.
- During recess, Ravi will interact with his peers daily.



USING ASI

Address ASI Session Goals

ASI therapy session plans will always be completed by a trained ASI therapist in a specialized clinic environment.

These sessions will be individualized to the learner, be one-on-one with the therapist, and occur on a regular schedule.

Some essential components of an ASI therapy session as implemented by a trained therapist include the following:

- a sensory experience
- a response to a challenge
- an enriched physical environment
- context of play
- therapeutic alliance (the trusting relationship between the therapist and learner).

These components are deconstructed in the next table based on the fidelity scale.¹⁶

ASI Fidelity

Trained ASI therapist worked one-on-one with the learner

Session occurred at the specified meeting time and place

Therapist ensured physical safety of the learner

Therapist presented sensory opportunities from at least 2 different modalities (for example, vestibular and proprioceptive)

Therapist helped the child maintain optimal level of alertness for engagement

Therapist supported and challenged at least one of: postural control, ocular control, and bilateral coordination

Therapist challenged planning and organization of behavior or series of behaviors

Therapist collaborated with learner in choosing activities and materials

Therapist tailored activities to provide “just right” challenges

Therapist ensured activities are successful

Therapist supported the learner’s intrinsic motivation to play

Established a therapeutic alliance (trusting relationship) with the learner



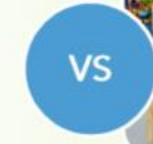
Use other EBPs to Support ASI

Remember that ASI sessions use naturalistic intervention strategies like supporting the learner's intrinsic motivation to play and collaborating with the learner in choosing activities/materials rather than formal prompting and reinforcement. Do some reflecting before and after each session to ensure ASI activities are naturally engaging and reinforcing to the learner.

Visual Supports & Modeling

Visual supports, like visual cues or visual schedules, can be used to guide the learner through an ASI session or prepare them for sensory experiences that will occur in their day.

Modeling - An ASI therapist can model a new sensory experience during an ASI session. Modeling can also be used to support generalization from the therapy setting to the classroom or school setting.



Visual Supports (VS)

Visual display that supports the learner engaging in a desired behavior or skills independent of additional prompts (Steinbrenner et al., 2020).

Where can I learn more?

- AFIRM Visual Supports module
- AFIRM Scripting module
- AFIRM for Paras Visual Cues: Introduction & Practice module
- AFIRM for Paras Visual Schedules supplemental module



Modeling (MD)

Demonstration of a desired target behavior that results in use of the behavior by the learner and that leads to the acquisition of the target behavior (Steinbrenner et al., 2020).

Where can I learn more?

- AFIRM Modeling module



Case Study - Mia

Mia has difficulty tolerating various tactile sensations including certain clothing items and food textures. She participates in twice-weekly ASI treatment sessions to learn to tolerate a wider variety of textures. Mia's therapist works to provide naturally reinforcing activities for Mia during the sessions. She also uses the additional EBP of modeling to make expectations clear for Mia.



Question: Which of the following is *not* an essential element of ASI sessions?

Answer choices:

A sensory experience

A small group setting

A “just right” challenge

An enriched physical environment

Question: Which of the following is *not* an essential element of ASI sessions?

Answer choices:

- A sensory experience
- **A small group setting**
- A “just right” challenge
- An enriched physical environment

Feedback: ASI sessions include a sensory experience, a response to a sensory “just right” challenge, and an enriched physical environment. ASI sessions take place in a one-on-one setting with the learner and a trained ASI therapist.

Promote Generalization

ASI therapy takes place in a controlled clinical environment where the learner is safe, supported, and comfortable with being challenged with sensory activities individualized to their goals. Generalizing the learner's positive sensory experiences in therapy to home, school, and community settings is a process.

To promote this generalization process, consider the following:

- Communicate regularly with the learner's team including trained ASI therapist, family, practitioners, and school personnel about consistently supporting the learner's sensory goals across settings
- Collaborate with the team to adapt home, school, and community environments to the learner's sensory needs when possible
- Work with the learner's team to establish consistent responses to the learner's challenging behaviors when sensory input becomes overwhelming
- Whenever possible, allow the learner to own their own sensory goals and include them in plans to generalize their skills and respond to unexpected sensory events

With the trained ASI therapist's guidance, the team will need to carefully review the learner's daily activities and social interactions to determine if ASI strategies would be appropriate during the school day. If so, plan opportunities for the learner to use strategies from the ASI therapist. It is important not to overly challenge the learner but to help them generalize skills they have gained in treatment to the school setting. Teachers will provide valuable knowledge of the learner's daily routines and activities.

One way to plan opportunities for ASI strategy use is to start with the *settings* in which the learner struggles and plan ASI strategies for improving the learner's response:

Setting	Sensory Stimuli	Learner Response	Possible ASI Strategies
Bus/arrival	Horn beep	Ear covering, humming	Provide noise-cancelling headphones for learner. Ask bus driver not to honk the horn.
Lunchroom	Food smells	Gagging, retching	Allow student to eat with small group in another room. Allow student to walk around lunchroom to outdoor seating area.
Math class	Seeking movement	Fidgeting, rocking	Add movement breaks into the math lesson. Move math class to directly after recess or gym class. Provide quiet fidget toys.
Social studies	Trouble focusing in a distracting setting	Lack of engagement, poor attention	Seat student at front of the class. Reduce distractions. Provide quiet fidget toy.
Any	Scheduled fire drills	Screaming, self-harm	Use visuals to warn learner. Provide noise cancelling headphones. Allow learner to leave the building first.
Assemblies	Noise, lights	Crying, aggression	Allow the student to go to a calming area if needed. Allow the student to watch a video of the assembly rather than attend in person.

Case Study - Damian

Damian has been working with an ASI therapist to address his sensory needs related to seeking movement. He has been making progress in his one-on-one sessions, and his team is ready to support generalizing the skills he has learned. To prepare for using ASI strategies at school, his teacher and school-based OT work with his therapist to develop the generalization plan here.

GENERALIZATION PLAN:

Time	Activity	Sensory Input	Behavior Observed	Possible ASI Strategies
7:45am	arrival	Just got off the bus	Pacing around the room	Provide flexible seating options
9am	Independent work	Long period of seated work	Lots of fidgeting in his seat	Schedule movement break
10:15am	Math lesson	Large group seated on carpet	Lots of movement, difficulty sitting still	Sit on edge of carpet, provide fidget toys
11:50am	lunch	Noisy, crowded space	Eats quickly, then runs to exit door and jumps	Sit at end of table, dismiss early to recess, provide space for walking

Question: The following people should be involved in planning for generalization of ASI strategies.

Answer choices:

The ASI therapist

The learner's family

The learner

All of the above

Question: The following people should be involved in planning for generalization of ASI strategies.

Answer choices:

- The ASI therapist
- The learner's family
- The learner
- **All of the above**

Feedback:

The ASI therapist should guide the generalization process. In addition to the learner and the learner's family, the teacher and other school-based personnel should work together to plan for and carry out the generalization process.

Using Activity

Which evidence-based practices would be useful in supporting Abby's ASI sessions?

Abby, a 5th grade student with autism, sees a therapist twice weekly to address her sensory needs. Her ASI provider is working with her to increase her tolerance of unexpected sensory stimuli. Abby reads at grade level, follows written instructions well and uses a visual schedule at school. Help Abby's therapist consider which additional evidence-based practices may be useful in supporting Abby's ASI sessions.

- Modeling (MD)
- Social Narratives (SN)
- Visual Supports (VS)
- Discrete Trial Training (DTT)
- Time Delay (TD)



Using Activity - Feedback

Which evidence-based practices would be useful in supporting Abby's ASI sessions?

- Modeling (MD)
- Social Narratives (SN)
- Visual Supports (VS)
- Discrete Trail Training (DTT)
- Time Delay (TD)

Feedback: Nice work! Based on what we know about Abby, visual supports and social narratives are the best choices.

MONITOR ASI



Collect and Analyze Data

You will need to collect and analyze data on the learner's ASI therapy progress by goal. You can use observational data to track this progress.

Important things to include on your observational data form:

- Setting of observation
- Sensory experiences available in the setting by modality
- Learner's response (or lack of response) to the sensory stimuli
- Level of prompting needed for learner to participate in that sensory setting
- Other EBPs or strategies used to support the learner

However, decide as a team how to collect data on ASI. It is important to continuously collect and review the data with the learner's ASI team.

Data Monitoring Example

MONITORING DATA:

Goal: Learner will eat lunch from home in the cafeteria without signs of discomfort or distress (e.g., crying, gagging, or leaving the table or room) in 4 of 5 opportunities.

Date	Sensory Stimuli	Behavior Observed	Support Needed	Notes
Monday	Chicken sandwich day – lunch from home + offered 2 bites sandwich (bread + chicken)	Ate 2 bites bread and breading off of chicken.	I	
Tuesday	Spaghetti day – lunch from home + offered 2 bites plain noodles, 1 bite meat sauce	Gagged when meat sauce put on plate. Ate 2 bites noodles.	P	
Wednesday	On field trip, picnic lunch from home in museum field	Learner calmly ate lunch in this quiet setting	I	
Thursday	Burger day – lunch from home + offered 2 bites burger meat, 2 bites cheese	Whining when burger meat and cheese put on plate. Tried cheese and spit out.	P	
Friday	Pizza day – lunch from home + offered 2 bites pizza, 2 bites pear	Cried when pear put on plate. Got up from table and refused to sit with pear. Ate slice of pizza.	P	

Prompt Key: V = Verbal; G = Gestural; M = Model; P = Physical; I = No prompts needed/Independent; O = No response; MD = Modeling; SN = Social Narratives; TA = Task Analysis; VM = Video Modeling; VS = Visual Support

ASI Reflection Guide

ASI REFLECTION:

1. How do you think that went?
2. Did you encounter any challenges implementing ASI strategies? Yes No
3. Were the activities naturally motivating for the learner, utilizing their natural drive to play? Yes No
4. At which points did you see ASI strategies working?
5. What could you have done differently?
6. Did you feel comfortable implementing the ASI strategies? Yes No
7. Did the learner respond positively to naturally occurring reinforcers? Yes No
8. Did the learner seem to enjoy the activities? Yes No

Determine Next Steps



Examining the learner's data will help team members decide about the effectiveness of using this practice and whether the learner with autism is making progress towards their ASI goals. If a learner is making progress based upon data collected, team members should continue to use the selected strategies.

If team members determine that the learner is not making progress, consider the following:

- Have team members received ASI training or is additional training needed?
- Is the target goal/behavior/skill well defined?
- Is the target goal/behavior/skill measurable and observable?
- Has enough time been devoted to using this practice (frequency, intensity, and/or duration)?
- Is the target goal/behavior/skill being targeted during appropriate routines and activities?
- Is ASI appropriate or a 'good fit' for the target behavior?
- Are the ASI strategies addressing the target behavior?
- Does the learner need additional supports?
Are the selected materials and activities intrinsically motivating for the learner?

If these issues have been addressed and the learner with ASD continues not to show progress, consider selecting a different evidence-based practice to use with the learner with ASD.

Question: Which of the following steps is NOT part of monitoring ASI?

Answer Choices:

- Occasionally collecting and reviewing observational data
- Collecting data on the level of prompting and support provided to the learner
- Using self-reflection when discussing ASI data
- Making decisions about the effectiveness of ASI based on the data

Question: Which of the following steps is NOT part of monitoring ASI?

Answer Choices:

- **Occasionally collecting and reviewing observational data**
- Collecting data on the level of prompting and support provided to the learner
- Using self-reflection when discussing ASI data
- Making decisions about the effectiveness of ASI based on the data

Feedback:

Continuous data collection is an important part of monitoring ASI. Data should then be reviewed on an on-going basis with the learner's ASI team.

Monitoring Activity

Based on analysis of collected observational data, draw conclusions, and identify possible next steps for the learner.

Colin, a second grader with autism, has demonstrated challenging behaviors (crying, gagging, and leaving the table) during lunch when exposed to the sensory aspects of certain foods. He also has a very limited diet, lacking in essential nutrients, and his family reached out to an Occupational Therapist to reduce his challenging behaviors around food and to expand his diet. His OT, trained in ASI, has been working with Colin on tolerating sensory aspects of food in a clinic setting. You have worked with Colin's OT to provide a visual cue to use his calming strategies when he is exposed to a non-preferred food. You have been using this ASI strategy with Colin for about two months, and his OT has asked you to provide some data on how Colin is doing at lunch time. You collect the following information:

MONITORING DATA:

Goal: Learner will tolerate two non-preferred foods next to his lunch from home without signs of discomfort or distress (e.g., crying, gagging, or leaving the table or room) in 4 of 5 opportunities.

Date	Sensory Stimuli	Behavior Observed	Support Needed	Notes
Monday	Chicken sandwich day – lunch from home + offered 2 bites sandwich (bread + chicken)	Ate 2 bites bread and breading off of chicken.	I	
Tuesday	Spaghetti day – lunch from home + offered 2 bites plain noodles, 1 bite meat sauce	Gagged when meat sauce put on plate. Touched but did not eat noodles.	P	Prompted with visual cue to use calming strategy when sauce was put on plate.
Wednesday	On field trip, picnic lunch from home in museum field	Learner calmly ate lunch in this quiet setting	I	
Thursday	Burger day – lunch from home + offered 2 bites burger meat, 2 bites cheese	Whining when burger meat and cheese put on plate. Tried cheese and spit out.	P	Prompted with visual cue to use calming strategies. Student responded well and finished meal.
Friday	Pizza day – lunch from home + offered 2 bites pizza, 2 bites pear	Cried when pear put on plate. Got up from table and refused to sit with pear. Ate slice of pizza.	P	Prompted with visual cue to use calming strategies with pear. Had to move pear farther away from learner for him to sit down.

Prompt Key: V = Verbal; G = Gestural; M = Model; P = Physical; I = No prompts needed/Independent; O = No response; MD = Modeling; SN = Social Narratives; TA = Task Analysis; VM = Video Modeling; VS = Visual Support

Based on these data, what conclusions can you draw to discuss with Colin's OT?

- Colin was observed to mostly tolerate the school lunch environment.
- Colin showed a strong preference for plain dry mild white foods like bread
- Colin was not ready to work on this goal in the lunchroom and should work on this goal in a separate room at school
- Colin was most distressed when offered wet, colorful, or fragrant foods.
- Prompting with visual cues is still needed to reduce distress around unfamiliar foods and keep Colin seated in the cafeteria setting.
- Colin seemed ready to remove his visual cue and use his calming strategies independently



Correct choices:

- Colin was observed to mostly tolerate the school lunch environment.
- Colin showed a strong preference for plain dry mild white foods like bread
- Colin was most distressed when offered wet, colorful, or fragrant foods.
- Prompting with visual cues is still needed to reduce distress around unfamiliar foods and keep Colin seated in the cafeteria setting.

Incorrect Choices:

- Colin was not ready to work on this goal in the lunchroom and should work on this goal in a separate room at school
- Colin seemed ready to remove his visual cue and use his calming strategies independently

Feedback:

Colin is making nice progress toward his goal with visual supports to use his calming strategies but would still benefit from ASI treatment to increase independence. Specific work on tolerating the presence of fragrant, wet, and colorful foods is important for Colin , as is intake of nutrient-rich foods like meat, fruit, and vegetables. These are important observations to discuss with Colin's OT and continue to monitor.

ASI Resources

Additional materials to help you with applying Ayres Sensory Integration (ASI):

Use the **EBP Step-by-Step Practice Guide** as an outline for how to plan for, use, and monitor EBP. Each step includes a brief description as a helpful reminder while learning the process.

Use the **EBP Implementation Checklist** to determine if the practice is being implemented as intended.

Use the **EBP Tip Sheet for Professionals** as a supplemental resource to help provide basic information about the practice to professionals working with the learner with autism.

Use the **EBP Parent Guide** to help parents or family members understand basic information about the practice being used with their child.

Use the **Additional Resources** to learn more about the practice.

The **EBP Brief Packet** contains all the resources and materials about the practice.

References

- Nowell, S. A., Szendrey, S., Steinbrenner, J. R., Hume, K., & Odom, S. O. (2021). *Sensory Integration: A companion to the NCAEP report*. The University of North Carolina, Frank Porter Graham Child Development Institute, National Professional Development Center on ASD. https://ncaeppfg.unc.edu/sites/ncaeppfg.unc.edu/files/resources/Sensory%20Integration_A%20Companion%20to%20the%20NCAEP%20Report.pdf
- Baranek, G. T., David, F. J., Poe, M. D., Stone, W. L., & Watson, L. R. (2006). Sensory Experiences Questionnaire: discriminating sensory features in young children with autism, developmental delays, and typical development. *Journal of Child Psychology and Psychiatry*, 47(6), 591-601.
- Ben-Sasson, A., Cermak, S. A., Orsmond, G. I., Tager-Flusberg, H., Carter, A. S., Kadlec, M. B., & Dunn, W. (2007). Extreme sensory modulation behaviors in toddlers with autism spectrum disorders. *American Journal of Occupational Therapy*, 61(5), 584-592.
- Ahn, R. R., Miller, L. J., Milberger, S., & McIntosh, D. N. (2004). Prevalence of parents' perceptions of sensory processing disorders among kindergarten children. *American Journal of Occupational Therapy*, 58(3), 287-293.
- Ben-Sasson, A., Carter, A. S., & Briggs-Gowan, M. J. (2009). Sensory over-responsivity in elementary school: prevalence and social-emotional correlates. *Journal of abnormal child psychology*, 37(5), 705-716.
- Kashefimehr, B., Kayihan, H., & Huri, M. (2018). The effect of sensory integration therapy on occupational performance in children with autism. *OTJR: Occupation, Participation, and Health*, 38(2), 75-83. <https://doi.org/10.1177/1539449217743456>
- Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. *The American Journal of Occupational Therapy*, 65(1), 76-85. <https://doi.org/10.5014/ajot.2011.09205>
- Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., van Hooydonk, E., Freeman, R., Leiby, B., Sendecki, J., & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders*, 44(7), 1493-1506. <https://doi.org/10.1007/s10803-013-1983-8>
- Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., Van Hooydonk, E., ... & Kelly, D. (2014). An intervention for sensory difficulties in children with autism: A randomized trial. *Journal of Autism and Developmental Disorders*, 44(7), 1493-1506.
- Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). Evidence-Based Practices for Children, Youth, and Young Adults with Autism. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team. <http://autismpdc.fpg.unc.edu/sites/autismpdc.fpg.unc.edu/files/imce/documents/2014-ASi-Report.pdf>
- Hunt, J., van Hooydonk, E., Faller, P., Mailloux, Z., & Schaaf, R. (2017). Manualization of occupational therapy using Ayres Sensory Integration® for autism. *OTJR: Occupation, participation and health*, 37(3), 141-148.
- Schaaf, R. C. (2015). "Clinician's guide for implementing Ayres Sensory Integration: promoting participation for children with autism" *Jefferson Faculty Books*. 93. <https://jdc.jefferson.edu/jeffersonfacultybooks/93>
- Ayres, A. J. (1989). *The sensory integration and praxis test (SIPT)*. Western Psychological Services.
- American Occupational Therapy Association. (2006). Policy 1.44: Categories of occupational therapy personnel. In Policy manual (2013 ed., pp. 32-33). Bethesda, MD: Author.
- Smith Roley, S., Schaaf, R. C. (2006). Sensory integration: Applying clinical reasoning to practice with diverse populations. Pro-Ed.
- Parham, L. D., Cohn, E. S., Spitzer, S., Koomar, J. A., Miller, L. J., Burke, J. P., ... & Summers, C. A. (2007). Fidelity in sensory integration intervention research. *American Journal of Occupational Therapy*, 61(2), 216-227.
- Parham, L. D., Roley, S. S., May-Benson, T. A., Koomar, J., Brett-Green, B., Burke, J. P., ... & Schaaf, R. C. (2011). Development of a fidelity measure for research on the effectiveness of the Ayres Sensory Integration® intervention. *American Journal of Occupational Therapy*, 65(2), 133-142.

The background of the image is a white surface covered with numerous question marks. These question marks are rendered in a variety of colors, including shades of red, orange, yellow, green, blue, purple, and pink. They are of different sizes and are scattered across the entire area, creating a textured, patterned effect.

Questions?

Questions

- *Is ASI an EBP that supports educational benefit and therefore can it be a service on the IEP? How would this be determined by an IEP team?*
- *Does medical insurance pay for ASI?*
- *Can ASI be implemented effectively in a school setting? What would be the pros and cons of providing this intervention during a school day?*