
Sensory Processing
Child Development
Movement For Learning
Mental Health

Sensory Processing Differences in Autism Across the Lifespan

Part 2: Sensory-Friendly Strategies for Home

Moira Peña, BScOT, MOT, OT Reg. (Ont.)
Occupational Therapist

 @MoirapenaOT
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Agenda

- Sensory processing differences & how they impact a person's behaviours
- The 3 most common sensory reactivity profiles
- Sensory-friendly strategies that support daily functioning

What is Sensory Processing?

Sensory processing is the way in which we interact with the world around us by:

- Taking in sensory messages from within our bodies & surroundings
- Interpreting these messages
- Organizing our purposeful response



Occurs at an unconscious level



Ranges from sensory preferences & quirks to severe dysfunction

“

EVERYONE PROCESSES SENSATION AND IT IMPACTS EVERY DOMAIN OF HUMAN FUNCTION AND PARTICIPATION.

”

*Virginia Spielmann,
Executive Director*

Sensory Awareness Month
www.spdstar.org



The Eight Sensory Systems

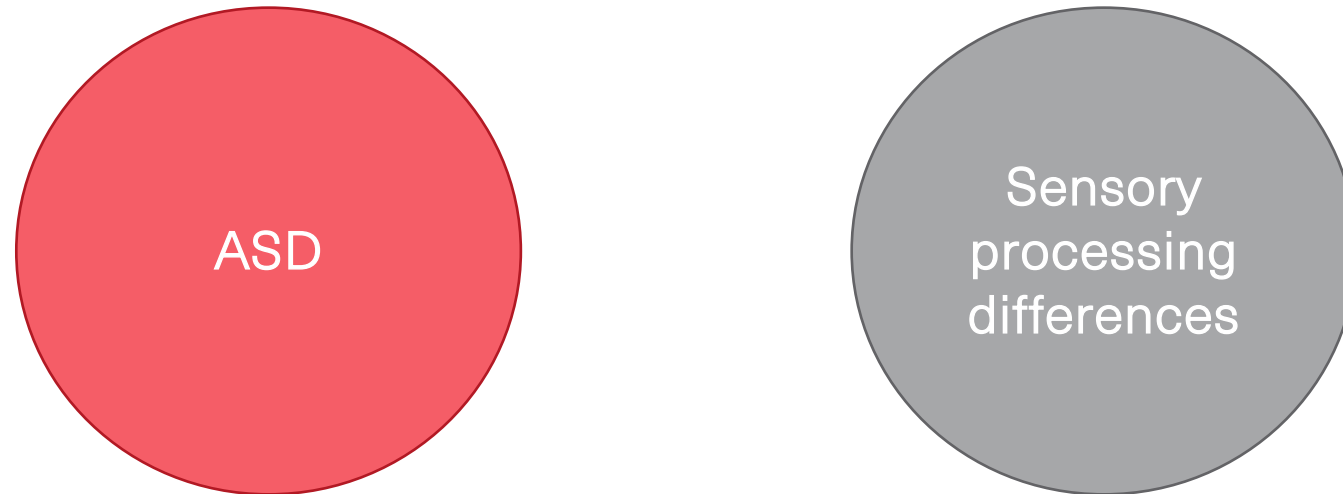


The Hidden Senses

- 6. Vestibular System
—Sense of body position & movement
- 7. Proprioceptive System
—Joint & muscle sense
- 8. Interoception System
—Sense of internal organs & recognition of emotional states

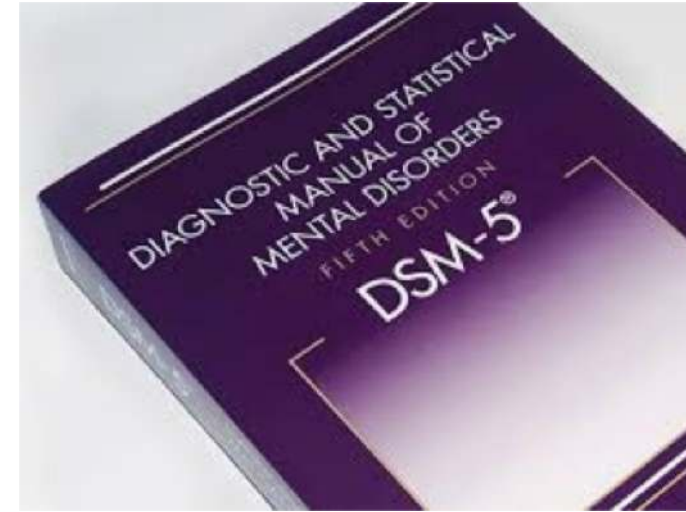
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Autism & Sensory Processing Differences



93 to 96% of children on the spectrum & autistic youth & 94% of autistic adults experience sensory processing differences to such an extent that they significantly impact daily functioning

DSM-5 (APA, 2013) Criteria for Autism Spectrum Disorder (ASD)



- A. "Persistent deficits in *social communication and social interaction*"
- B. "*Restricted, repetitive* and *stereotyped* patterns of behavior, interests or activities"
- ★ "Hyper or hypo-reactivity to sensory input or unusual interest in sensory aspects of the environment"
- C. "Symptoms present in early developmental period"
- D. "Symptoms cause clinically significant impairment in [...] functioning"
- E. "Symptoms cannot be better explained by an intellectual disability" - but can be comorbid

Importance of Sensory Reactivity in Autism

“One of the most debilitating symptoms for some children and adults with autism is sensory oversensitivity”

“From as far back as I can remember: I always hated to be hugged... It was like a great all engulfing tidal wave of stimulation...”

“Tactile stimulation for me and many autistics is a no-win situation. Our bodies cry out for human contact but when the contact is made, we withdraw in pain and confusion”

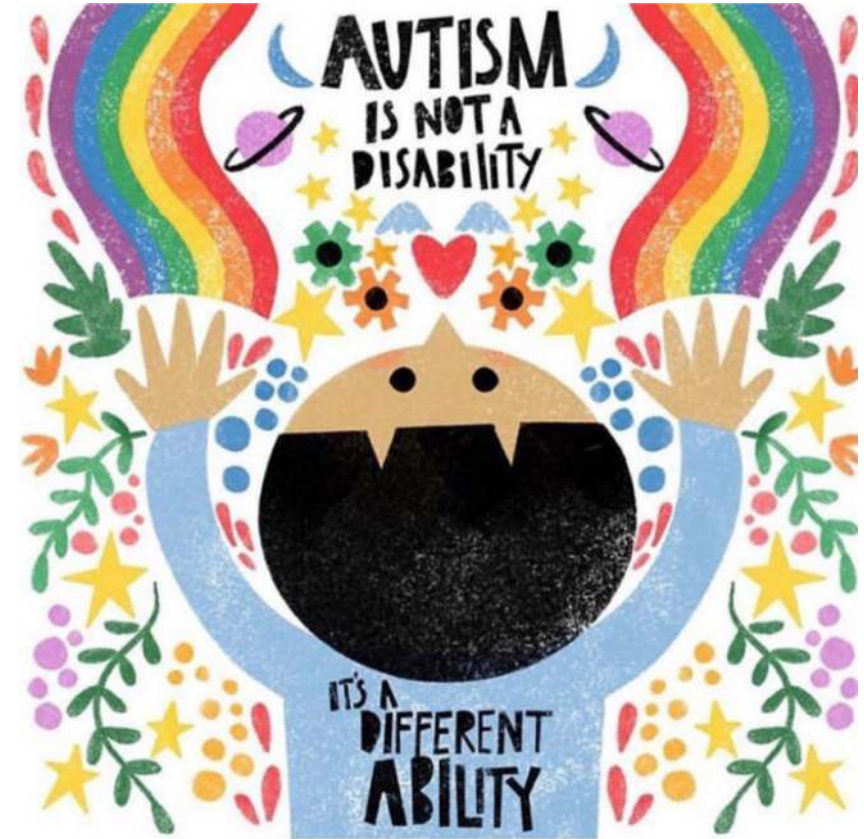


Temple Grandin, Autistic Self-Advocate

But...

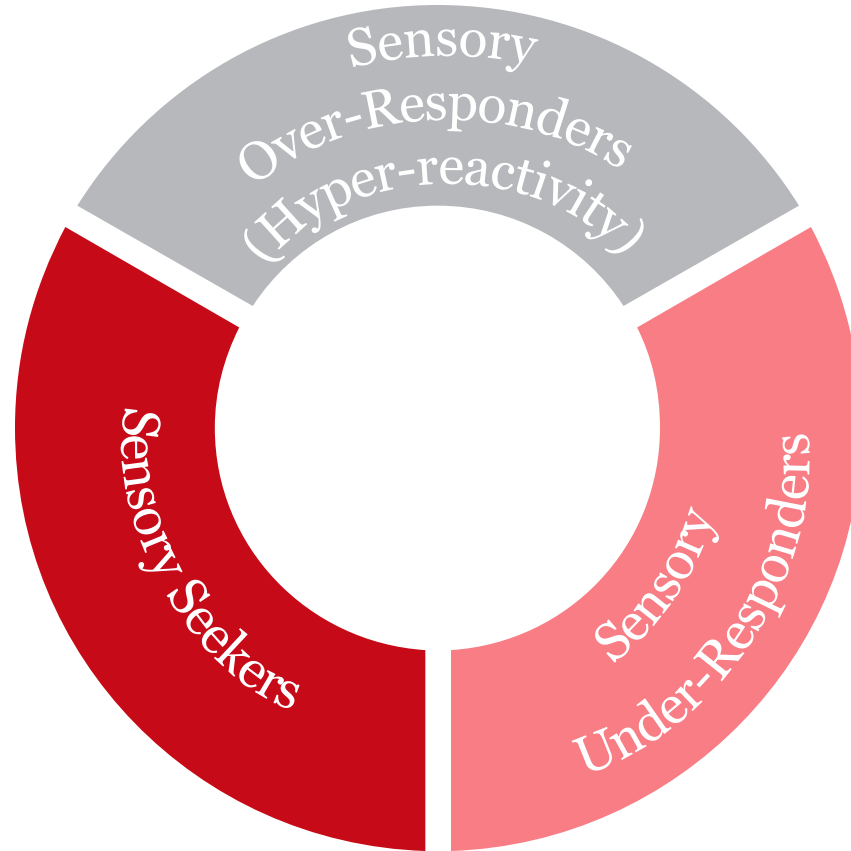
- Sensory processing differences are not always synonymous to difficulties but may in fact be a source of unique gifts & quality of life

“When a little girl’s giggles color the walls and ceilings with rainbow foam when she is amused by my echolalia..... I feel blessed for being what I am.”
(Mukhopadhyay, 2008)



@julianapillustration

Most Common Presentations: A Focus on Sensory Reactivity Profiles



★ Understanding a person's sensory profile helps us to determine the **'why'** behind behaviours & to identify what types of **supports** a person needs to more easily engage, relate & learn

Sensory Over-Responders (SOR)

- Over-reaction to sensations
- Person will try to move away or block the sensory input (particularly during self-care tasks)
- Person may react 'aggressively' or 'controlling' when overwhelmed by sensory stimulation
- Very cautious, fearful, upset by changes in routine & ++challenges with transitions
- Hypervigilant, anxious
- May shut down
- ★ Thrives with predictable routines

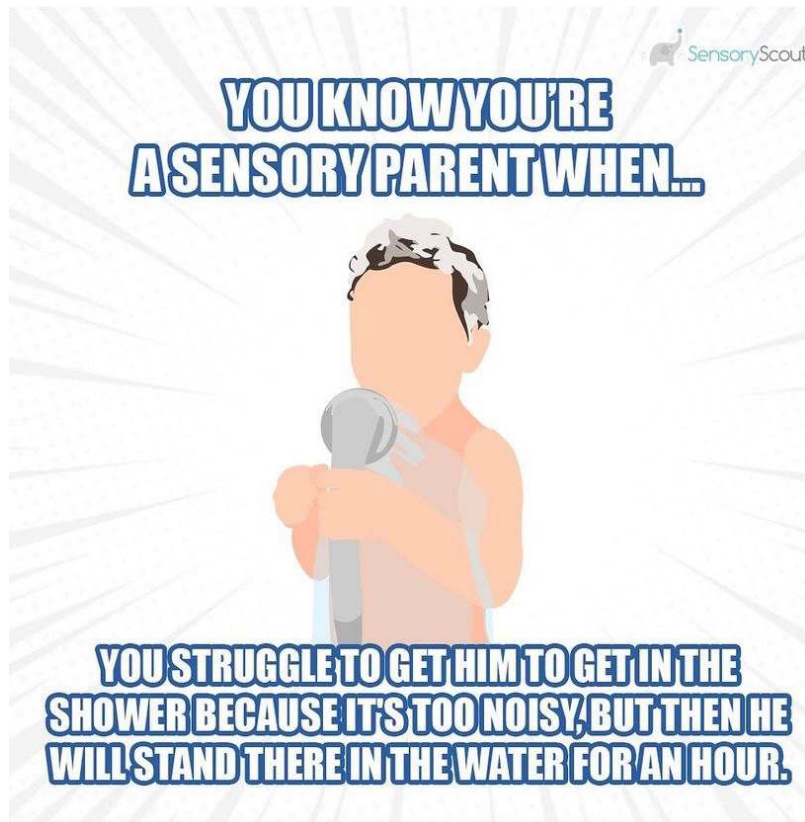
DAILY SENSORY THINGS THAT ARE HARD TO HANDLE

@21andsensory



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Sensory Over-Responders (SOR)



@sensoryscout

—Correlations with ASD (Bart et al., 2017; Carpenter et al., 2019; Syu & Lin, 2018), ADHD (Lane & Reynolds, 2019; Lane et al., 2012) anxiety (Green & Ben-Sasson, 2010), GI issues (Mazurek et al., 2013), picky eating (Cermak et al., 2010), sleep problems (Mazurek & Petroski, 2015), self-injurious behaviours (SIBs) (Duerden et al., 2012), increased parental stress & challenges in participating in everyday activities (Reynolds & Lane, 2008)

- ★ Families of children with SOR exhibit more impairments than families of children with psychiatric diagnoses (Ben-Sasson et al., 2009)

Sensory Over Responsivity (SOR): Sensory Input=Pain

“Strip lighting... that can immediately... **hurt** a lot”

“If textures (of food) were mixed...the sensation makes me want to feel **physically ill**”

“People brushing past me.. It’s like pain mixed with panic... and I can become quite **aggravated** because of it”

“Bad smells feel quite **painful**”

“Loud noise can bother me.... And it can feel **painful**”

“Every time I am touched it **hurts**; it feels like fire running through my body”

★ “In fact, sensory sensitivities ... may actually predispose autistic people to chronic pain.” (Failla et al., 2021 as cited in Jeffrey-Wilenski, 2021)

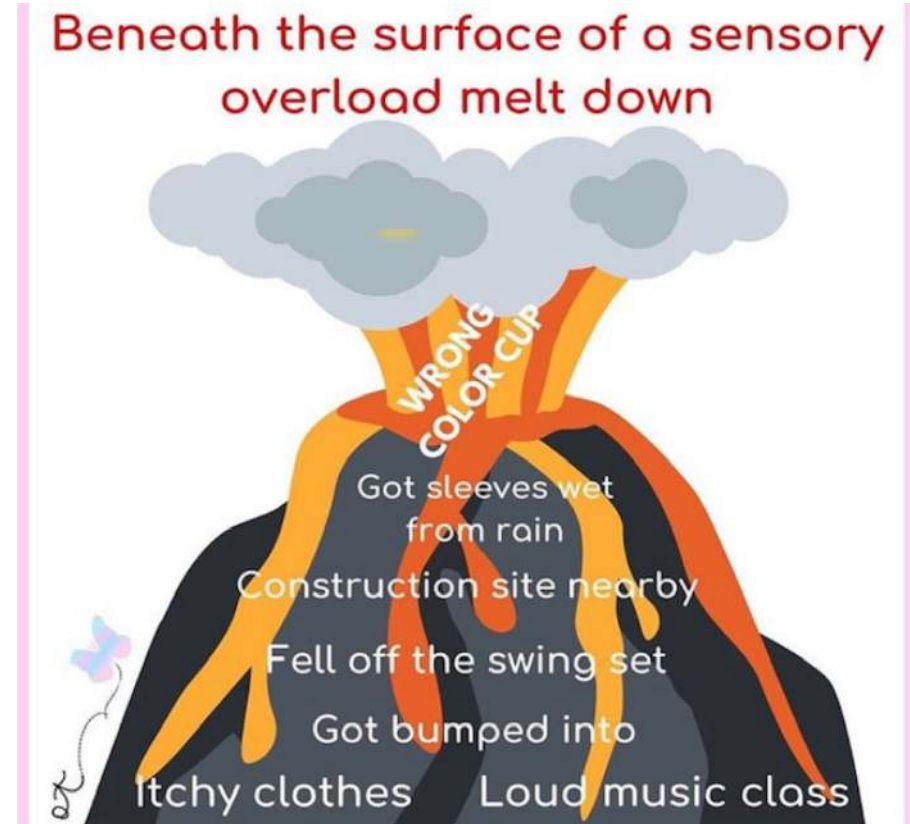
Quotes from autistic adults
(Robertson & Simmons, 2015)

Sensory Inputs Add Up Throughout The Day → Meltdowns

—*Allodynia*: perceiving non-painful sensations as irritating, non-pleasant or painful (Bar-Shalita et al., 2019)

—These sensations are higher in intensity & linger for a longer duration after the stimulus is over (Bar-Shalita et al., 2009, 2012; Weismman-Fogel et al., 2018)

—Explains the accumulation of aversive sensations experienced by individuals with SOR (Kinnealey et al., 2015)



@theotbutterfly

Sensory Under-Responders (SUR)

- Does not react to sensory input they should be reacting to
 - Unaware of body sensations
 - Passive behaviours – lies down on the floor, leans on others or furniture
 - Does not notice others in the room
 - Slow to respond, quiet, withdrawn, uninterested in exploring games
 - Becomes tired quickly
 - May lack awareness of danger (heights, crossing streets, etc.)
- ★ Thrives with explicit & multisensory teaching



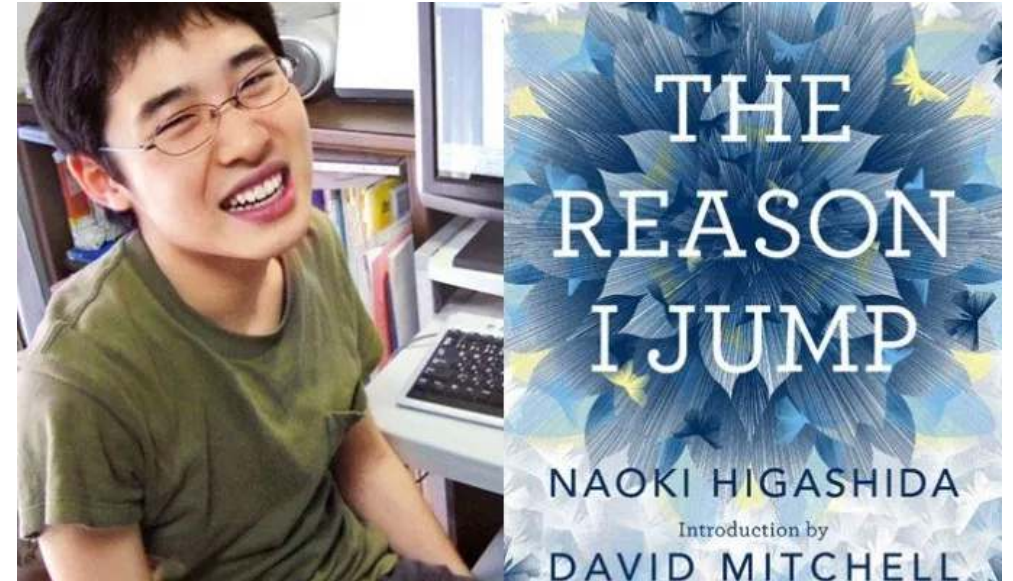


Phung, J., Penner, M., Pirlot, C., & Welch, C. (2021).
What I Wish You Knew: Insights on Burnout,
Inertia, Meltdown, and Shutdown From Autistic
Youth. *Frontiers in psychology*, 4981.

Learning from Autistic Voices: Recognizing the Gap Between Intention & Action in Autism

—“One of the biggest misunderstandings you have about us is your belief that our feelings aren’t as subtle and complex as yours. Because how we behave can appear so childish in your eyes, you tend to assume that we are childish on the inside too. Stuck here inside these unresponsive bodies of ours, with feelings we can’t properly express, It’s always a struggle just to survive.”

~ Naoki Higashida,
Autistic Self-Advocate



Sensory Seekers

- Seeks constant stimulation
- Likes crashing, bumping, jumping, roughhousing
- Constantly touches objects
- Licks/mouths/chews on objects
- Takes excessive risks during play or when engaged in physical activities
- ★ Thrives in active/multisensory environments & when given access to sensory tools




www.unsplash.com

The Eight Sensory Systems



The Hidden Senses

- ★ 6. Vestibular System
—Sense of body position & movement
- ★ 7. Proprioceptive System
—Joint & muscle sense
- 8. Interoception System
—Sense of internal organs & the basis of emotions

A young girl with dark hair, wearing a white t-shirt, is looking upwards with a curious expression. She is surrounded by numerous colorful heart-shaped decorations (red, yellow, blue, green, pink) hanging from the ceiling by thin white strings. The background is a plain, light-colored wall.

The Sensory Diet Approach: An Effective Tool for Supporting Sensory Processing Differences:

Moira Peña, BScOT, MOT, OT Reg. (Ont.)
Occupational Therapist

The Sensory Diet Approach/Sensory Supports Plan

Sensory Lifestyle/Feel Good Menu

- Sensations are ‘food for the brain’; they provide the knowledge needed to direct the body & mind” -*Dr. A. Jean Ayres*
- “A sensory diet provides the necessary combinations of sensory input to feed or nourish a person’s nervous system” -*Dr. Patricia Wilbarger*
- “A sensory lifestyle is how you incorporate the sensory tools that you have into every day life” -*Dr. Lucy Jane Miller*



@thesensoryprojectshow

Short Term Goals of a Sensory Diet Approach



- Help an over-responsive person to modulate reactions to sensory input
- Increase the alertness level of a under responsive person
- Prevent uncomfortable reactions to sensory stimuli
- Support an optimum level of function and participation
- Gain an understanding as to **why** certain behaviours occur

Long Term Goals of a Sensory Diet Approach

- Understand own sensory profile & why we react in the way that we do
- Understand which sensory supports are effective in helping a person self-regulate when faced with stressful situations → helps the person to learn which accommodations they need to advocate for
- Support a person's ability to participate in different contexts (outings, social events, etc.)
- Opportunities for practice, improve endurance & motor planning skills
- Improve a person's quality of life!



Peña, M., Ng, Y., Ripat, J., & Anagnostou, E. (2021). Brief report: parent perspectives on sensory-based interventions for children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 51(6), 2109-2114.

Components of a Sensory Diet Approach

1. A schedule of sensory inputs:

—Formal schedule OR

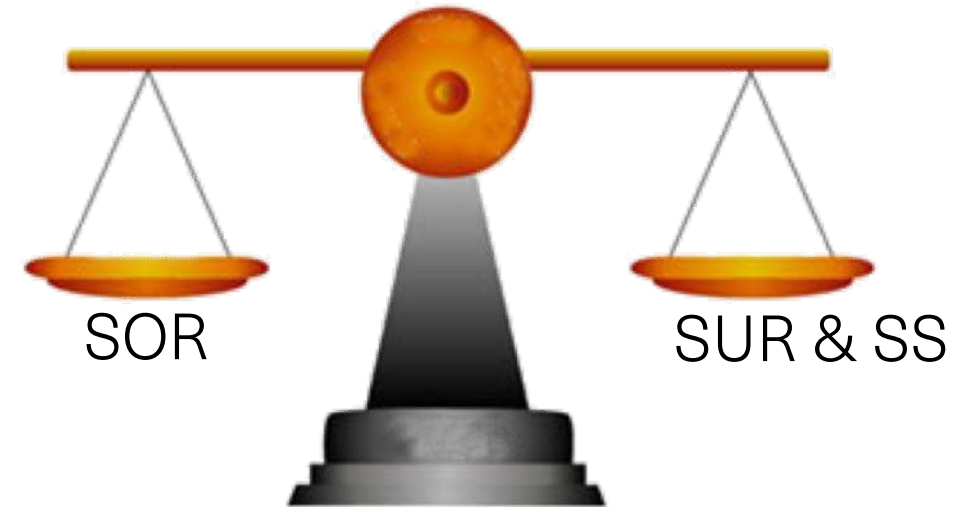
★ *Embedded into daily routines*

2. Environmental Adaptations & Access to Sensory Supports/Tools

3. Interaction style → Co-regulation

4. Leisure/recreation activities

Sensory Health



★ An effective sensory diet is personalized & requires active & collaborative problem solving!

Become a Sensory Detective!

1. Label the behavior & reflect
2. When does it happen?
3. What prompts it to happen?
4. Who does it happen with?
5. Where does it happen?
6. Why do you think it happens? What is the person seeking or avoiding?
7. What strategy do you want to try together to see if it decreases the frequency & intensity of the behaviour?
8. Did the strategy work? What could we do more or less of?



Adapted from: Aquilla, Edelstein & Riczer, 2017. *The Sensory Detective Curriculum*

1. A Schedule of Sensory Inputs

The Vestibular System

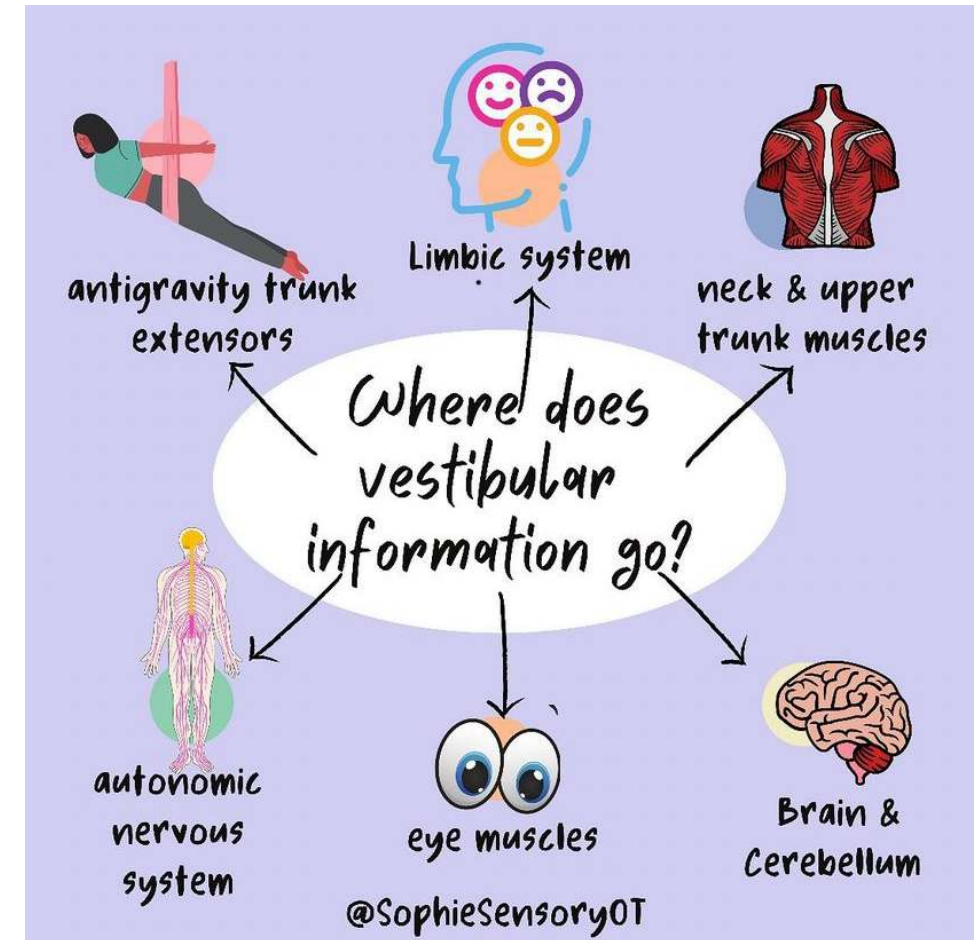
—Orientation of the head in relation to gravity

—Works together with the visual & proprioceptive systems (Devlin et al., 2009)

★ Master Sense: integrates movement information with all the senses (Ayres, 1979)

—Contributes to physical and emotional security (cortical projections to the limbic system)

★ The Power Senses: The Vestibular, Proprioceptive & Tactile Sensory Systems



1. A Schedule of Sensory Inputs

Practical Vestibular Ideas For Home:



Yoga poses or asanas



Simply Fit Board



@sensoryscout



★ Look for opportunities for movement throughout the day!



Flexible Seating Options



Embed movement within household chores



Safe Jumping

Simple obstacle courses!



rocking

1. A Schedule of Sensory Inputs

The Proprioceptive System

—Gives us a map of the body without the aid of vision. Our innate knowledge of what muscles are flexing & where your body parts are in space.

—Works with the vestibular & visual sensory systems to keep posture upright, develop balance & reacts when posture is challenged → sense of safety



Research findings in ASD:

—Deficits in ASD (Weimer et al., 2001)

—Poor awareness of force (Mostofsky & Ewen, 2011; Schaaf & Lane, 2015)

1. A Schedule of Sensory Inputs

Proprioception ('Heavy Work Activities')

★ Carrying, Pulling, Pushing, Dragging, Squeezing & Lifting Activities

- Chewing: gum, chewlery or crunchy snacks
- Wearing a heavier backpack or clothing
- Tug-of-war with a towel
- 'Pushing' the wall away
- Climbing, jumping & hanging activities
- Biking, swimming, lifting weights
- Household chores
- Bouncing on a ball
- Digging in the dirt, snow shoveling
- Chair push-ups



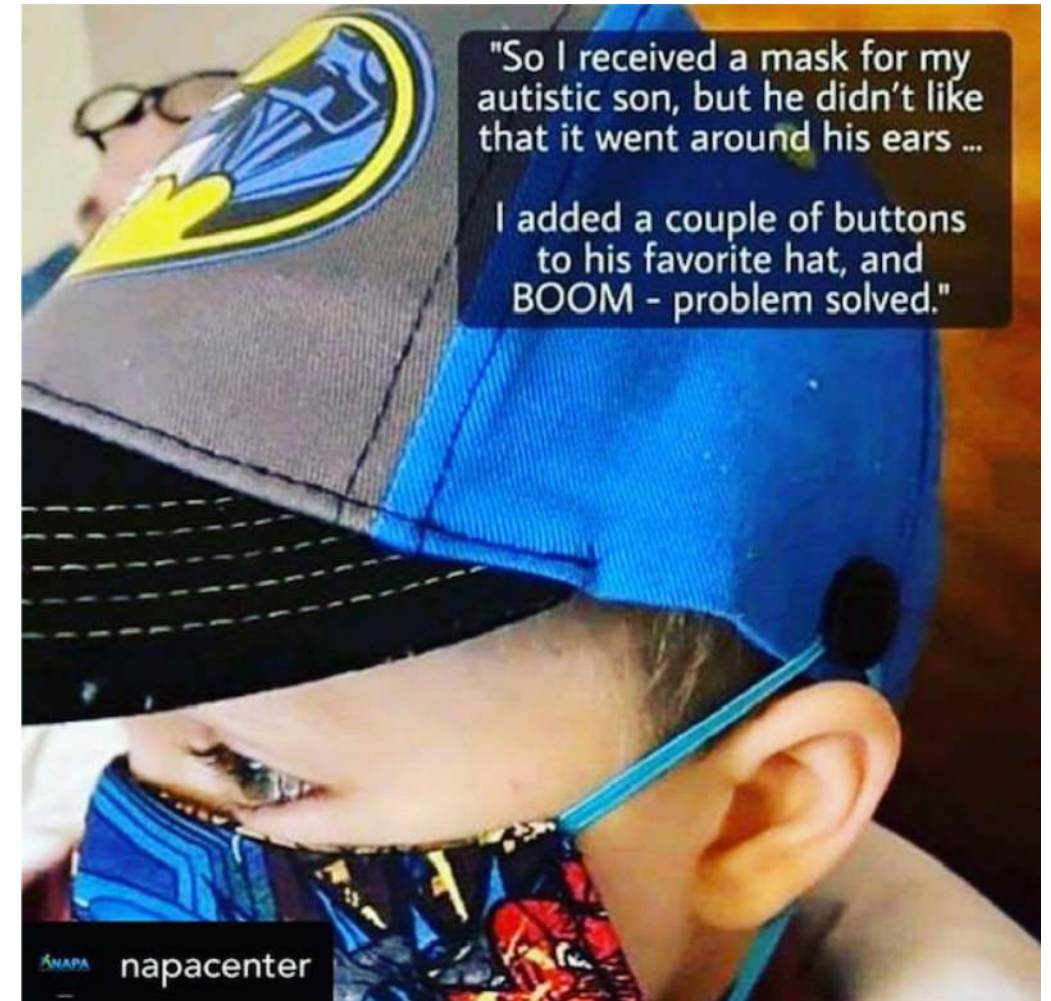
@otinspired

1. A Schedule of Sensory Inputs

The Tactile System

- Essential system for development, communication & relationships
 - Provides information about light touch, vibration, deep pressure, temperature & movement
 - Most problematic sensory system affecting activities of daily living in autistic people
 - Dressing, toothbrushing, face washing, hair combing, feeding & sleep
- (Reynolds & Lane, 2008)

Maira Peña OT



1. A Schedule of Sensory Inputs

Deep Touch Pressure Input

- Tight hugs or self-hugs
- Massage
- ‘Burrito’ blanket roll up
- Spandex clothing (smaller swimming shirts, tights, compression sports wear, etc.)
- Sandwich game (pressure with a ball)
- Squishing with pillows
- Pushing hands together/pulling fingers apart
- ‘Crashing’ onto mattress
- Fidget tools
- Sitting in a bean bag chair



@recoverydoodles



Stretch-eze



compression garments

★ Biology Comes First Principle
Is the person hungry, thirsty, tired or in pain?
Is the person under particular stress?

2. Environmental Adaptations & Access to Sensory Tools

- Adapt the Environment
 - ✓ Dim the lights
 - ✓ Visual choice board & schedules
 - ✓ Reduce noise
 - ✓ Predictable routines
- Provide access to sensory supports/tools
- Create sensory safe spaces or 'islands of retreat'



@the expertally

Be Proactive & Prepared for Sensory Overwhelm: Creating Sensory Kits & Sensory- Friendly Spaces



Sensory Kit from
@actuallyautisticalien



@hvppyhands



Ikea swivel
arm chair

@autismmotherhood



@lifehacker



@arcs.solutions

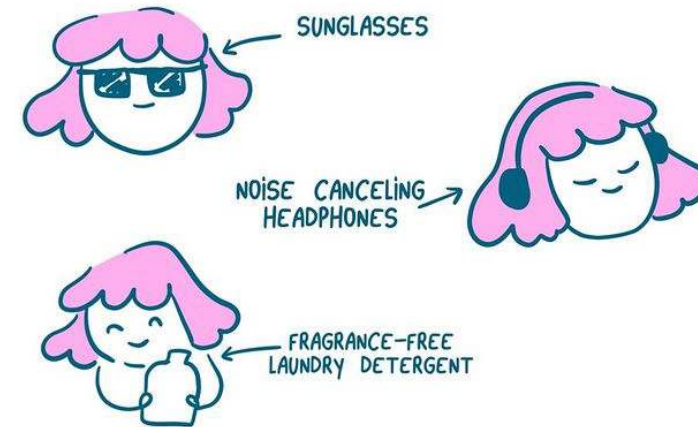
Sensory Strategies ARE Mental Health Interventions!

COPING STRATEGIES TO USE ON PUBLIC TRANSPORT

@21andsensory



HOW TO DEAL WITH SENSORY OVERLOAD ?

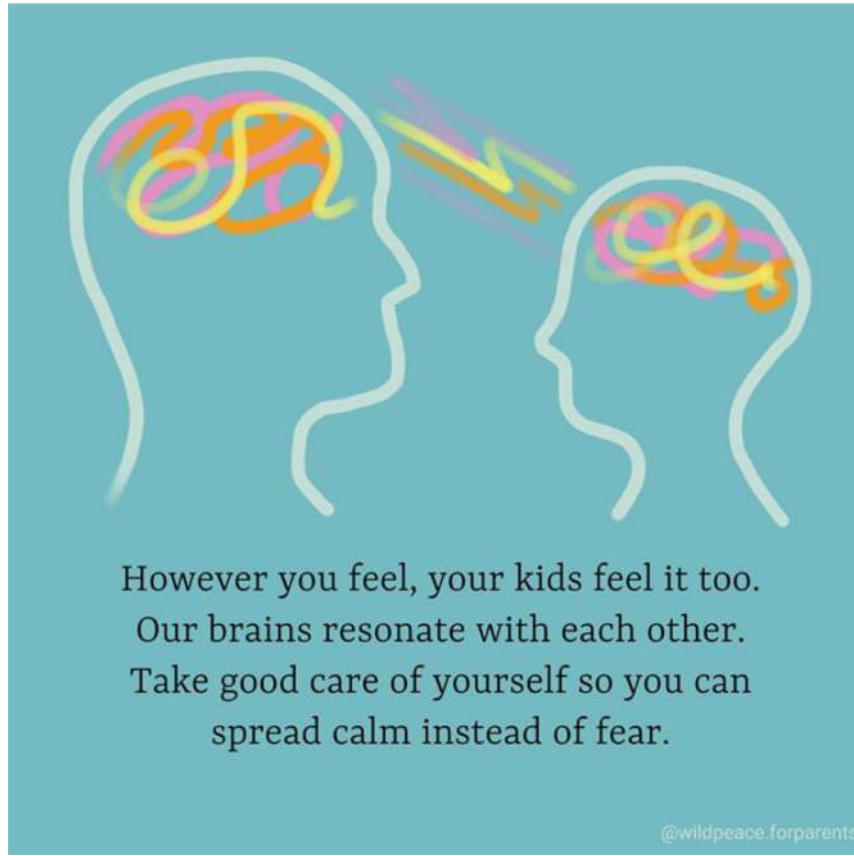


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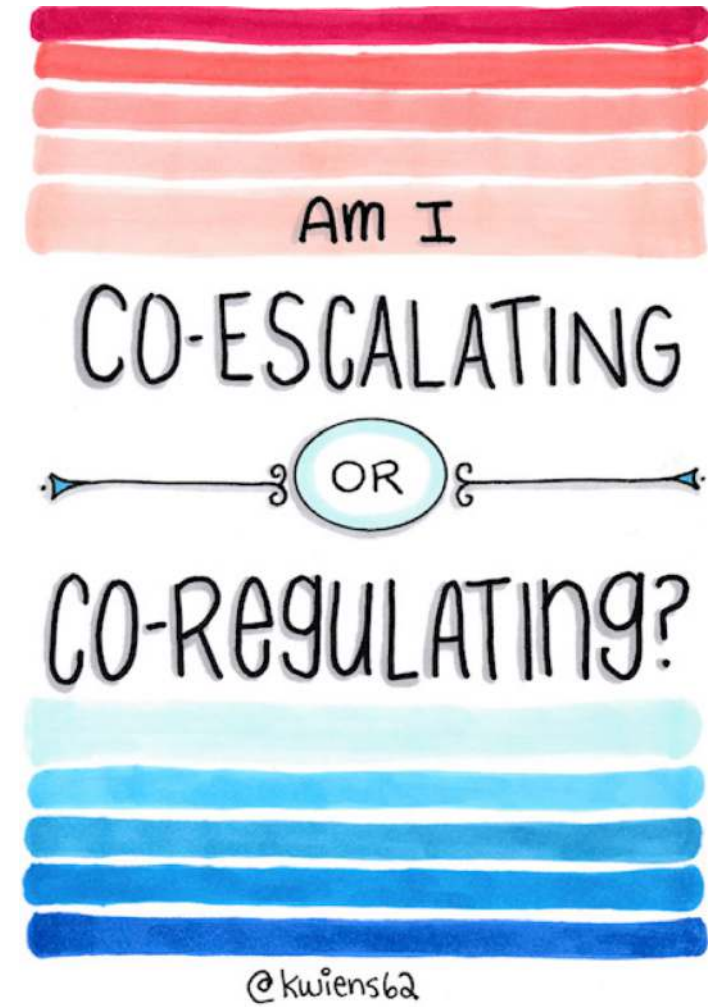
MAKE ADAPTATIONS WHEN YOU CAN !

@THE_MINI_ADHD_COACH

3. Interaction Style → Co-Regulation



★ To promote flexibility,
we need to model
flexibility



4. Recreation/Leisure Activities

Bremer, E., Crozier, M., & Lloyd, M. (2016)

FUN
FACTOR!



bike-riding



swimming



bowling



Incorporate the
Power Senses!



martial arts



running



yoga & mindfulness

rock climbing



horseback
riding



stretching

foam & pin
rollers



Productive Fails are
Part of the Process!

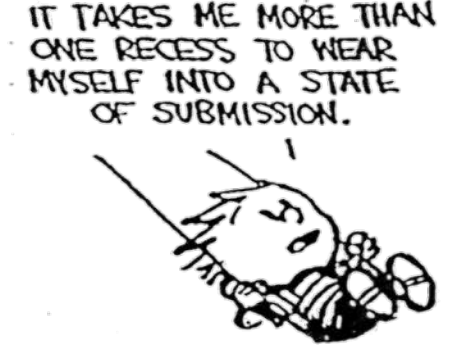
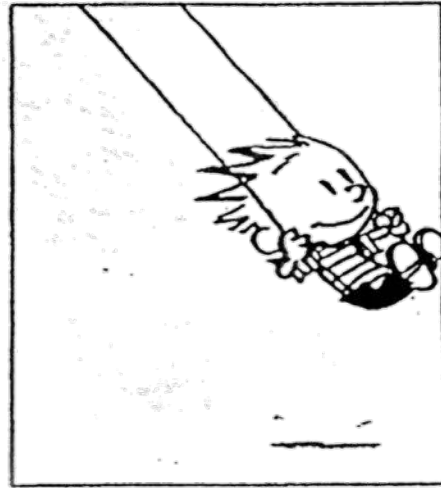
Embrace Complexity & Individual Differences in Autism

“Growth is a process of experimentation, a series of trials, errors and occasional victories. The failed experiments are as much a part of the process as the experiments that work.”

-Dr. Cherie Carter-Scott



The Sensory Diet Approach In Action!



Calvin and Hobbes by Bill Watterson for October 28, 1992

Summary on Sensory-Friendly Strategies For Home



- Become a Sensory Detective & think about what sensory experiences the individual on the autism spectrum might be seeking or might be trying to prevent by engaging in the observable behaviour
- Validate feelings- sensory input CAN be perceived as painful & the pain may linger!
- Adopt a Sensory Diet Approach to learn how to best support the autistic person's sensory needs
- Design low cost sensory-safe spaces within your living & work spaces & be prepared by creating a sensory kit if planning to enter a potentially sensory overwhelming experience
- Co-regulation is key! Be aware of your own reactions (as a parent, partner or supporter) as they may compound the autistic person's experience of sensory overwhelm
- Embrace Productive Fails! Human beings are complex- reach out for an evaluation & support from an occupational therapist (OT) & work together in the creation of an individualized sensory diet that best meets the autistic person's sensory needs

Resources

Developed by Elsbeth Dodman (Autistic Self-advocate), Moira Pena (OT), and Dr. Fakhri Shafai (PhD, M.Ed.) on behalf of AIDE Canada

Provides:

- First-person autistic narrative of sensory experiences
- Neuroscience background
- Tips for how to become a “Sensory Detective”
- Strategies to try at home



TOOLKIT

Sensory Processing Differences Toolkit

<https://aidecanada.ca/learn/sensory-regulation/sensory-processing-differences-toolkit>

Resources

Feeding Differences in Autism Toolkit Developed on Behalf of AIDE Canada

Provides:

- First-person autistic narrative of feeding differences
- Reasons autistic people experience feeding challenges
- Research on co-occurring medical conditions that may be contributing to feeding differences
- BEST strategies to try at home

Moira Peña OT



Learn | **ASD/ID Core**
Knowledge

Overview

Feeding Differences in Autism Toolkit

**MOIRA PENA, CHRIS KILMER, SAMANTHA
HUANG, AND DR. FAKHRI SHAFAI**

<https://aidecanada.ca/learn/asd-id-core-knowledge/feeding-eating-issues-toolkit>

Resources

Sleep Challenges in Developmental Disabilities on behalf of AIDE Canada

Provides:

- First-person autistic narrative of sleeping differences
- Reasons autistic people experience sleeping challenges
- Research on co-occurring medical conditions that may be contributing to sleeping differences
- Strategies to try at home

Moira Peña OT



Learn | Behavioral
Supports

Overview

Sleep Challenges in Developmental Disabilities

CHRISTOPHER KILMER, BSW, RSW; MOIRA PENA, BSCOT, MOT; DR. FAKHRI SHAFI, PHD, M.ED.

<https://aidecanada.ca/learn/behavioral-supports/sleep-challenges-in-developmental-disabilities>

Sensory Processing Resources

Websites

<https://sensoryhealth.org/>

www.sensorysmarts.com

www.toystoolsandtreasures.com

www.fdmmt.ca

www.flaghouse.ca

Sensory clothing: <https://calmcare.com/>

<https://otvest.com>

Apps:

Noisli: personalized background noise

Pokemon Smile App for Toothbrushing App

https://play.google.com/store/apps/details?id=jp.pokemon.pokemonsmile&hl=en_CA

Books

Building Bridges through Sensory Integration (Yack, Aquilla & Sutton)

Living Sentionally: Understanding Your Senses (Winnie Dunn)

The Out of Sync Child Has Fun (Carol Kranowitz)

The Sensational Child (Lucy J. Miller)

Sensory Like You (Schneider & Dillon)

Arnie and His School Tools: Simple Sensory Solutions that Build Success (Jennifer Veenendall)

Beyond Behaviours (Mona Delahooke)

Brain-Body Parenting (Mona Delahooke)

Divergent Mind: Thriving in a world that wasn't designed for you (Jenara Nerenberg)

The Sensory-sensitive Child: Practical Solutions for Out of Bounds Behaviours (Karen Smith & Karen Gauze)

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Thank you!

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