Making Sense Out of Sensory Processing Disorder

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Historical Evolution of SPD

A. Jean Ayres, PhD, OTR, sensory integration pioneer, developed the theory, assessment and treatment methods for sensory integration dysfunction.
Lucy Jane Miller, PhD, OTR studied under Jean Ayres and has furthered the work through her sensory research, education, and treatment.
Terminology

- Originally termed sensory integration dysfunction
- New terminology of sensory processing disorder adopted
SPD Definition

A neurophysiologic condition in which sensory input either from the environment or from one’s body is poorly detected, modulated, or interpreted and/or to which atypical responses are observed. (Miller 2013)
Indicators of SPD include inappropriate or problematic motor, behavioral, attentional, or adaptive responses following or anticipating sensory stimulation.
Sensory differences are only considered a “disorder” when they cause significant difficulties with daily routines and tasks (e.g. individual can’t cope or compensate).

Quality of life is key in understanding the significance of sensory impact on an individual.
Exact cause of SPD is not identified but preliminary studies suggest a role of:

- Genetics
- Prenatal/birth complications
- Environmental factors
Not recognized as a formal medical dx at this time – came close in ICD-10 formulation

Sensory differences are included in DSM-5 diagnostic criteria for ASD

Included in the Diagnostic Manual for Infancy and Early Childhood -

Section I – Primary Diagnosis: Axis I: Regulatory-Sensory Processing Disorders
8 Sensory Systems

- Auditory
- Visual
- Taste
- Smell
- Touch
- Vestibular System
  sense of position & movement
- Proprioceptive System
  joint & muscle sense
- Interoception System
  sense of internal organs
Sensory Processing Disorder (SPD)

- Sensory Modulation Disorder (SMD)
  - SOR
  - SUR
  - SC
- Sensory-Based Motor Disorder (SBMD)
  - Dyspraxia
- Postural Disorder

Sensory Discrimination Disorder

- Visual
- Auditory
- Tactile
- Taste/Smell
- Interoception

SOR=Sensory Over-Responsivity
SUR=sensory UnderResponsivity
SC=Sensory Craver

Miller, L J, et. al., 2007
Phenotypes within Sensory Modulation Disorder (SMD)

SMD = Impairment in detecting, modulating, interpreting, or responding to sensory stimuli

- Sensory over-responsivity
- Sensory under-responsivity
- Sensory craving
Sensory Over-Responsivity (SOR)

- Hypersensitivity to sensations (visual stimuli, sounds, touch, movement, tastes, smells)
Sensory Over-Responsive Behaviors

- Respond too much, too frequently, or too long to sensory stimuli
- Get aggressive or impulsive when overwhelmed by sensory stimuli
- Irritable, fussy, moody (hyperalert emotions)
- Unsociable; avoids group activities, difficulty forming relationships (social scene too overwhelming)
- Excessively cautious and afraid to try new things
- Upset by transition and unexpected changes
Sensory Under-Responsivity (SUR)

- Individual is less sensitive to and less aware of sensory stimuli than most people
Sensory Under-Responsivity Behaviors

- High pain threshold
- Doesn’t noticed when touched
- Unaware of need to go to the bathroom
- Usually prefers sedentary activities
- Passive, quiet, withdrawn
- Difficult to engage in social interactions
- Excessively slow to respond to directions
- Lack motivation or drive
Sensory Craving

- Individual seems to need much more sensory stimuli than most people
Sensory Craving Behaviors

- Constantly on the move
- Likes crashing, jumping, rough housing
- Excessive spinning, swinging, rocking
- Constantly touches objects or people
- Seeks vibration
- Watches spinning objects
- Constant talking; trouble turn taking in conversation
Variability with SPD

Sensory differences can impact any individual sensory system or multiple senses. Individual can have mixed responses –

**across sensory systems:**
- e.g. under-respond to touch input but over-respond to auditory input

**within sensory systems:**
- e.g. be over-responsive to light touch and craver of deep touch
Quick Poll

Do you view yourself more as a sensory:
1. over-responder
2. under-responder
3. craver
Incidence of SPD

Present in children and adults

- 5 - 16% of typically developing children
- 70 – 90% children and adults with ASD have impairments in sensory processing
- 40 – 60 % with ADHD have SPD
Difference between ADHD and SPD

- ADHD is more impulsive
- ADHD has anxiety specific to social concern, not sensory aspects
- SPD and ADHD have similar reactions to initial stimulus, ADHD habituates, SPD does not
Current Research on SPD

- Children affected with SPD have quantifiable differences in brain structure

- For the first time shows a biological basis that sets it apart from other neurodevelopmental disorders.

(Shivani Desai, BS, Emily Fourie, BS, Julia Harris, BS, and Susanna Hill, BS, all of UCSF, and Anne Arnett, MA, of the University of Denver, 2013)
Current Research on SPD

Children with SPD have decreased structural brain connection in specific sensory areas different than those in autism

SPD is a stand alone diagnosis
References


Clinician Background & Training

Post Professional Training

- Certification: Sensory Integration and Praxis Tests (SIPT)
- Intensive Mentorships: SPD Foundation, Spiral Foundation
- Workshops
Evaluation

- Sensory Integration and Praxis Test (SIPT)-standardized test
- Sensory Processing Measure (SPM)-questionnaire
- Sensory Profile-questionnaire
- Clinical Observations
- Parent reports on participation in activities of daily living
- Teacher reports on sensory and academic challenges
Purpose of the Sensory Profile and the Sensory Processing Measure Questionnaires

- Aids the team in determining what are the sensory challenges
- Examines social participation in relation to sensory issues
- Allows comparison across and between environments - home and school
- Promotes team problem solving for program planning

Information courtesy of SPD Foundation
The SPM is a standardized school and home based questionnaire for children Preschool to 6th grade.

An infant/toddler version is in the works.
Sensory Profile 2

5 questionnaires in the kit:

- Infant
- Toddler
- Child
- School Companion
- Short
Sensory Profile for Adolescents and Adults

- Adolescent/Adult Self Rating Questionnaire
- Adolescent/Adult Caregiver Questionnaire

It’s never too late to seek help for sensory processing challenges
Sensory Integration and Praxis Test (SIPT)

- Standardized for ages 4 yrs to 8 yrs, 11 months
Clinical Observations

Some of the behaviors seen in an evaluation:

- Frustration tolerance
- Attention to task
- Persistence with task
- Response to transitions
- Impulse control
- Direction following
- Motor planning
- Eye hand coordination
- Postural control
- Tactile Defensiveness
- Auditory Defensiveness

Information courtesy of SPD Foundation
Caregiver Report

Activities of Daily Living
- Dressing
- Grooming/Hygiene
- Bathing
- Eating
- Sleeping
- Playing
Sensory Evaluation At CHDD

An OT evaluation of Sensory Challenges includes:
- Parent questionnaire- SPM or Sensory Profile
- Clinical observation
- Play observation
Evidence-Based Practice

- There is extensive and ongoing research on the efficacy of occupational therapy for the intervention of sensory integration

- In 2007, a randomized controlled study of “The Effectiveness of Occupational Therapy for Children with Sensory Modulation Disorder” demonstrated that OT-SI was effective.  

- The Sensory Processing Disorder Foundation is the first organization to operate a full-time program of research into SPD
Intervention for SPD

Clinic

School

Home
In the Clinic

- The goal is to decrease the impact of sensory challenges through rehabilitation, remediation, modifications, adaptations and parent education.
Sampling of Items Seen in a Sensory Clinic

sensorycityot.com/open-sensory-gym/
Swings
Therapeutic Listening Programs

- A type of brain fitness that trains the neurological pathways needed for daily functioning.
- Used in clinic and home in conjunction with other interventions
- Learning
- Neuro-Development
- Social and Emotional Behavior
Intervention for SPD at the STAR Center
Role of OT in the Home

- Direct intervention
- Coach parents
- Educate family to help their home be more sensory friendly
Feeding Therapy

- Picky Eater or Problem Feeder-
- Is Sensory Processing Disorder affecting the child’s ability to eat?
Play Intervention

DIR Floortime

- Supporting relationships through play
OT Consultation

Home Environment

- Consult re: equipment, toys and materials
- Home modifications

- SmartKnitKIDS™
  Seamless Sensitivity Socks
- soft
  clothing for all children
OT Consultation at Home

- Sensory Lifestyle
A Sensory Lifestyle
Heavy Work

Examples of Heavy Work at Home
- Vacuuming
- Sweeping
- Mopping
- Carrying laundry basket

Examples of Heavy Work at School
- Chair push ups, wall push ups
- Animal walks
- Chewy snacks (fruit roll-ups, jerky, dried fruit).
- Crunchy snacks (dry cereal, vegetables, pretzels, popcorn)
- Carry appropriately heavy notebooks to the office or from class to class.
OT in the Schools

- Occupational Therapy is a “related service” in the child’s Individualized Educational Plan (IEP)

- The child must qualify for special education services to be eligible for OT at school

- The goal is to increase participation in the academic environment
Role of OT in the School

- Direct treatment in the classroom or motor room
- Consultation with teachers
- Accommodations or modifications
Sensory Accommodations at School

- Fidgets
- Wiggle cushion
- Noise reduction headphones
- Weighted lap pads, vests
- Weighted pencils, utensils
- Theraband
- Brain Breaks
- Heavy work
Sensory Modifications in Schools

- Alternate seating
- Look at lighting
- Suggest desk arrangement
- Provide education on sensory regulation tools
  - The Zones of Regulation
  - The Alert Program
Sensory Regulation Tools to Build Self Awareness

The **ZONES** of Regulation®

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<th>YELLOW ZONE</th>
<th>RED ZONE</th>
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<td>Silly/Wiggly</td>
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<td>Excited</td>
<td>Yelling/Hitting</td>
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<td>Moving Slowly</td>
<td>Ready to Learn</td>
<td>Loss of Some Control</td>
<td>Out of Control</td>
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Alert Program

![Alert Program Image](image-url)
Quick Poll

Does your profession support and encourage sensory awareness?

1. Not supported
2. Informally supports
3. Somewhat supports
4. Fully supports
References

- Ahn, Roianne, PhD, *Sensory Processing in Adults*, SPD Foundation
- Braddock, George: Creative Housing Solutions – gbcchs.com/
- DIR Floortime: http://www.icdl.com/DIR
- Haber, Elizabethe and Iris Sava, Deanna; Heavy Work Activities List for Occupational Therapists -- Useful for Designing a Sensory Diet for Children with Sensory Processing Disorders; retrieved from: http://www.skillsonthehill.com/wp-content/uploads/2012/01/Heavy-Work-List-for-Parents.pdf
- Research: http://spdfoundation.net/research.html
- Video: Star Center Tour; http://spdstar.org/videos/
- Wilbarger, Patricia OTR/L : http://www.avanti-ed.com/2.html
Resources

- Sensory Processing Book List
- Websites/Resources on Sensory Processing
- Sensory Materials/Equipment Vendor List

Be sure to consult with an Occupational Therapist for guidance on what sensory tools would benefit you or your child.
Thank You

Support for attending the advanced mentorship at STAR Center was generously provided by The University of Washington CHDD and the LEND Program.
Questions?