

Empowering our Kids to Succeed

Understanding Sensory Processing and the Neurochemistry of Fear

Dr. Karyn Purvis

Empowered to Connect, April 8 - 9, 2011

Sensory Processing Disorder (SPD): Where did it begin?

- Stressful Pregnancy
- Difficult Birth and/or Prematurity/NICU
- Early Hospitalization
- Abuse
- Neglect
- Trauma

Sensory What?

- A newly adopted two year old is seizing.
- A six year old unexpectedly punches another child standing behind him in the lunch line. The Principal punishes him by taking away his recess for a week and making him sit quietly in the corner of his office for the rest of the day.
- An eight year old briskly rubs her mother's "goodbye" kiss off her face as she leaves for school.
- The teacher is complaining about this six year old... When he colors, he breaks all of the crayons. In art, he refuses to use the play dough. In music, he has "melt-downs".

Functions of Sensory Input

- Alert
 - Attend or orient to new and/or important stimuli
- Protect
 - Defend us if a stimuli is too overwhelming. This is the first level of sensory integration.
- Select
 - Filter out the non-essential input.
- Organize
 - This is accomplished by the central nervous system. It is done automatically, most of the time.

Fight, Flight, or Freeze

- Fight
 - Frustration, explosive or aggressive, resistive, acting out, saying "I won't", "NO!"
- Flight
 - Distractible, clowning, redirecting, escaping behavior, easily bored.
- Freeze

- Whiny, tearful, clingy, fearful, reluctant to separate or to try new things, withdrawing, hiding, saying “I can’t”.

SPD Resource Book

- *The Out-of Sync Child* by Carol Kranowitz

Understanding the Internal Senses

- Vestibular
 - The “powerhouse”
- Proprioceptive
 - Firm, gentle muscle pressure, calming and organizing.
- Tactile
 - The first sense to develop en utero in all known-species
 - The harbinger of attachment deficits.
- *The Out of Sync Child*
 - *By Carol Kranowitz*
- Screening instrument in first section of the book (pages 28ff).
- “Your child at home”
- “Your child at school”
- Recommendations for implementation S.I.

“Sensory Diet”

- Based on the idea that the individuals need a certain amount of activity and sensation in order to be alert and maintain that level of alertness.
- Combination of proprioceptive & vestibular inputs get best results
- **Lifespan of input effectiveness:**
 - Proprioception lasts 2 hours
 - Deep pressure to skin lasts 2 hours
 - Vestibular input can last from 2 to 6 hours

Parent's Exploratory Journal

Behavior	Date	Circumstances
Tantrum over getting dressed!	Oct. 10, 8:30 a.m.	Says his socks are too tight and he hates his new turtleneck sweater.
Inconsolable at school!	Oct. 14, 10:00 a.m.	Teacher said he was fine until it was time for art project (finger paint).
At restaurant, spilled his milk on the table and his clothes.	Oct. 22, noon	Sometimes he can't manage getting milk into his mouth!
Screamed in grocery store and threw an orange at friendly old lady.	Nov. 23, 4:30 p.m.	Day before Thanksgiving. Noisy, crowded store. Old woman (stranger) tousled his hair
Fell apart at the playground. Tantrum lasted twenty minutes!	Dec. 18, 2:00 p.m.	All I did was spin her a few times on the tire swing....usually she loves the tire swing!

From: *The Out of Sync Child*, page 153

Ubiquitous Sensory Input

- Making up songs to reinforce scripts
- Crab crawl
- Riding bikes
- Trips to the park
- Playing on trampoline
- Basketball
- ".....with LOTS of practice before we go!"

Tactile Input

- Playing in bean pool
- Finding small toys in rice bucket
- Rolling on carpet or different textured areas
- Making play-dough
- Making bread
- Cooking activities

Proprioceptive Activities

- Pushing others on "buddy-board"
- Oral-motor toys
- "Chewlry"
- Bubble gum
- Theraband activities
- Chair sit-ups

- Chair push-ups
- Hanging on “monkey bars”

Vestibular Activities

- Swinging on swing
- Trampoline
- Slow rocking
- Spinning
- Log rolling
- Jungle-gym play
- Wheel-barrow games

Crash-n-Bump

Watch for Sensory Overload

- Nausea
- Vomiting
- Level of arousal
- Pupil constriction
- Sweating
- Change in skin color
- Dizziness
- Withdrawn behavior

Examples of Sensory Profile Factors

- Auditory Processing
- Visual Processing
- Vestibular Processing
- Touch Processing
- Multisensory Processing
- Oral Sensory Processing
- SP Related to Endurance/Tone
- Modulation Body Position and Movement
- Modulation of Movement Affecting Activity Level
- Modulation of SP Affecting Emotional Responses
- Modulation of Visual Input Affecting Emotional Responses
- Emotional/Social Responses
- Behavioral Outcomes of SP
- Threshold for Response
- Sensory Seeking
- Emotionally Reactive
- Low Endurance/Tone
- Oral Sensory Sensitivity

- Inattention/Distractibility
- Poor Registration
- Sensory Sensitivity
- Sedentary
- Fine Motor/Perceptual

The Chemistry of “Felt-Safety”

- **Zane’s Early History** (A Case Study)
 - Prenatal exposure to drugs & alcohol
 - History of severe neglect
 - Neglect repeated in foster care
 - Eating problems
 - Behavioral problems
 - Violence & aggression
 - Kicked out of public school
 - Held school library “hostage” 2 hours

Neurochemistry of Fear: Neurochemistry profiles of at-risk adopted and foster children

Early Research:

- Isolate Infant Frozen in Fear
- Playful Engagement
 - Altered developmental trajectories
 - Altered neural development
 - Altered social and reproductive abilities
 - Altered immune function
 -

Alterations in Serotonergic Systems:

- Deficits in Serotonin have been linked to many types of emotional and mental disorder including those listed here:
 - Panic Disorder
 - Agoraphobia
 - Obsessive-Compulsive Disorder
 - Post-Traumatic Stress Disorder
 - Depression
 - Bi-Polar Disorder
- Deficits in Caregiving and/or Genetic Vulnerability can contribute to disorders attributed to alterations in serotonin levels and/or receptors.