SENSORY PROCESSING AND THE SENSORY BUDGET

How do we know anything at all about the world? Our sensory system is responsible for accurately taking in information so our brain can interpret this information and then do something with it. For everyone, this process happens instantaneously and continuously throughout the day ("I see red, I see round, I hear bouncing, I smell plastic…it's a ball"). In essence, our sensory system is the first line of information interpretation. In order to interpret information correctly, we must perceive it accurately.

But what if your sensory system short-circuited somewhere in the process–what would happen to this information? Imagine if a miniscule piece of information, such as color, texture, or smell, was incorrectly interpreted. For example:

> *Until I was about 27 years old, I hated wearing pants. The texture irritated me. Jeans felt like razors on my legs, and pants felt slimy. It was as if something was grabbing me all day long. On top of wearing these pants, I was supposed to be concentrating in school and acting nice to people–what were they thinking?! The sensation of pants or jeans would highjack my sensory system, and I would become progressively deregulated, ultimately leading to a meltdown. When I was a child, as a coping skill, I started wearing tights that were too small under my pants. This provided me with deep pressure and a barricade between my legs and my pants, allowing me to last longer during the day.*
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> *Another example: As a child I would only eat meat and plain tan/white food (bread, crackers, potatoes, etc.). Prior to eating my meat I would need to wash it to minimize the flavor. When meat is washed it all tastes the same, so there was no element of anxiety-provoking surprise!*

Now multiply the above experiences by dozens of events each day—and then multiply again by each one of your senses: touch, taste, smell, sight, sound, movement, and position in space. What happens to your world now? When you're about to sit in a chair, how do you know when to shift your weight from your legs to your buttocks so you don't fall? How do you know not to touch a hot stove? How do you know if you're hungry? When driving through a small tunnel, how do you know not to be anxious because your car won't smash into the bottom of the arch?

Your sensory system is constantly providing you with feedback to help you make good decisions throughout the day—but if you are a person with Asperger's Syndrome, you may be unusually sensitive—or relatively insensitive—to various stimuli. This may lead you to over-react or under-react, and will probably lead to discomfort, confusion, and anxiety. If you perceive a "neutral" stimulus (walking down a school hallway) as threatening (heightened noises, overwhelming smells, disorganization, etc.), your body will interpret the sensory information as dangerous/threatening, and anxiety provoking. With this type of faulty sensory system, it is virtually inconceivable that people with sensory disregulation can master the environment and navigate their days calmly.

In the book, ***Sensory Integration: Theory and Practice*** (by Anita C. Bundy, Shelly J. Lane, Anne G. Fisher, Elizabeth A. Murray) the authors quote this definition by A. Jean Ayres, the pioneer of sensory integration:

> *"[Sensory integration is} the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment. The spatial and temporal aspects of inputs from different sensory modalities are interpreted, associated, and unified. Sensory integration is information processing… [T]he brain must select, enhance, inhibit, compare, and associate the sensory information in a flexible, constantly changing pattern; in other words, the brain must integrate it." (p. 11)*

Sensory processing can be broken down into two categories:

- **Internal**: processing what's going on inside your body, such as temperature, respiration, arousal, circadian "sleep" rhythms, pressure and pain.
- **External**: processing information from outside your body, such as smells, tastes, feeling things (texture, temperature), sounds, and the appearance of objects.

Internal processing is much more disturbing and disorienting than external processing. Inside myself I feel a change, but have extreme difficulty accurately interpreting what the change is. For example, when I was younger and felt hungry, thirsty, hot, cold, tired, excited, angry, bored, frustrated, anxious, or needed to go to the bathroom, all my internal sensations registered as the same signal. I knew *something* had changed, but I didn't know what the "something" was—all I knew was that it felt like I was trapped inside a burning building. I didn't know what I needed to do to fix the problem. By the time I figured out what my body was trying to tell me, it was often too late. By then, a tidal wave of sensation had begun: I was exhausted, starving, *really* needed to pee; a small emotion had escalated into anger or frustration; anxiety was now intense and pervasive.

For most people with AS, sensory issues lessen in intensity over time—but they do not vanish. As an adult, I still have to work hard at reading my own internal signals and regulating myself. It has been relatively easy for me to develop coping skills to help me process or escape from external stimuli. For example, when I hear a painful siren, I can immediately cover my ears. When I am flooded with *internal* stimuli, however, I can't escape; I just have to ride out the wave and pray it doesn't drag me under! Years ago, I realized I had to developed a system to prevent both internal and external sensory overload. I did develop a system that works: it's called a sensory budget.

Sensory Budget

If you keep filling a water balloon, it will eventually it will burst—and it's the same for your sensory system! To manage my own sensory environment and modulate my own sensory system, I created a budget. I outlined all activities that I engaged in and assigned a numerical value to each one. Some activities eat only a few points. For example: eating a non-offensive food like bread = 1 point. Social interactions = from 4 up to 26 points, depending upon the topic of conversation, the familiarity of the people, and the location where the interaction occurs.

Each day I start with a budget of 100 sensory points, and I know I must live within my budget in order to remain stable and not melt down. Every activity, from getting out of bed in the morning to attending a concert in the

evening "eats" sensory points—and this is true even if an activity is pleasurable or fun. Surprises or unexpected events tend to eat away at my budget, because anxiety, unpredictability, and needing to be flexible are high point eaters!

Once I'm getting close to using 100 points, I need to end my day by going to sleep or retreating—unless I can find a way to neutralize some of my points. Just as exercise neutralizes caloric intake, certain activities can replenish or neutralize sensory points by evoking the "relaxation response." I call these neutralizing activities "sensory preventions." The only way I have found to keep myself regulated and stable is to prophylactically (preventively) partake of sensory preventions multiple times ***each and every day***.

Sensory Preventions

If you are raising or working with a child with Asperger's Syndrome, it is vital to apply these preventions *prior* to the child becoming over-stimulated (using up too many points) and dysregulated. Once the child is dysregulated, the anxiety response is ignited. Then it takes significantly more interventions for the child to return to a neutral state—not to mention it's kind of cruel and inhumane to the child. The added anxiety stemming from dysregulation itself can further dysregulate the person, leading to a negative, self-perpetuating cycle: "I get over-stimulated which leads to anxiety which leads to further dysregulation which leads to further anxiety, etc."

Preventions or interventions are most useful if the child can take them along wherever s/he goes. Since one never knows when or where sensory overload may occur, relying on specialized equipment to facilitate the relaxation response can sometimes be counterproductive. As a child, when I would get upset I used our swing set to calm down. However, when I became upset during the wintertime or in the middle of math class, the swing was not an effective intervention! Therefore, having "pocket interventions" is helpful.

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Sensory Activities

When seeking appropriate sensory activities, it is important to think in terms of each sense individually, and whether the person needs to increase input (to stimulate) or to decrease input (to calm). Below are a few examples of regulating activities that may help certain children:

SENSE	WAYS TO INCREASE STIMULI	WAYS TO DECREASE STIMULI
Sight	Videogames, anything symmetrical (i.e., patterns in nature), hang items from the ceiling (mobiles, etc.), paint walls bright colors or white.	Baseball hat, blurring vision, remove all hanging things from the walls and ceiling of the classroom, make sure the blackboard is clear of extraneous stimuli, turn off florescent lights, paint room soft soothing colors (no patterned wall paper).
Taste	Spicy or salty foods, foods with smooth or rough textures, hard candy or gum	Bland food with calming texture
Touch/tactile	Chin up bar, wall push-ups, rubbing textures on skin, small pocket toys, weighted vest (to provide input), play tickle games, pocket beads, small cloth, ther-a-band (rubber band) around the legs of the child's chair, or lotion/cream.	Ask before touching the person; weighted vest (for calming) or blanket, long or short sleeves; don't make the child wear socks
Hearing	MP3 player (music), headphones in the classroom, or FM System (wireless sound transmission)	Ear plugs or noise cancellation headphones; tennis balls on the bottom of chairs so they don't scratch across the floor; shut doors and windows in classroom; rugs or carpeting.
Smell	Wear perfume, eat strong smelling food, or wear shaving cream	Wash clothes in chemical/fragrance-free detergent; let clothes go without washing as long as they are not really dirty; open windows when using cleaning products or use fragrance free products
Motion	Treadmill, walking up/down stairs, basically, anything that involves moving	Staying still; closed dark places (i.e., sensory break room)

I hope this article will help adults with AS create their own sensory budgets, identify their own sensory preventions, and use them as tools for living more comfortably and successfully. Parents, teachers, and therapists can work with children to create sensory budgets, and identify preventions. It will also be helpful to use the chart above to adapt the basic home and school environment—and plan the child's schedule—to meet the child's sensory integration needs.