



Making
Sense-ory®
Out of Behavior



By Tara Delaney, MS, OTR/L

Let's suppose Dr. B.F. Skinner, the father of applied behavioral analysis, and Dr. Jean Ayres, the founder of sensory integration theory, were discussing a child's behavior. Skinner may begin the discussion by saying, "it is only the observable behavior that matters," while Ayres would argue, "it is the internal sensory processing that determines the observable behavior." However if they had the whole night to discuss it through, as well as access to the latest brain research, they might come to the conclusion that neither view, alone, offers a complete explanation of behavior in children with autism. They may even have agreed that the sensory component is a likely antecedent for many behaviors observed.

Multi-View

The adage, "There's at least two sides to every story" appropriately applies to behavior and how we view it. The most dominant theoretical framework currently used to explain the behaviors of children with Autism Spectrum Disorder (ASD) is derived from the science of applied behavioral analysis (ABA). ABA utilizes the power of consequences while considering the antecedent to modify observable behavior. The over-simplified "ABC" explanation is this: the antecedent (A) is considered to modify a behavior (B) through the use of consequences (C). Another theoretical framework that is gaining attention as a way of explaining behaviors for children with ASD is sensory integration (SI) theory, which postulates that our sensory systems affect our behaviors. ABA and SI are not mutually exclusive; rather they can be married

together to make sense in describing many behaviors exhibited by individuals with ASD. Many children with ASD have sensory processing difficulties.¹ For many these difficulties are the "hidden" antecedent for the observable behavior. If we alter our perspective to consider that sensory processing difficulties are the antecedent to behavior, then our understanding of how the child views the consequence is altered and so too will be our approach to therapy. This may be a viewpoint on which the behaviorist camp and the sensory processing camp can agree.

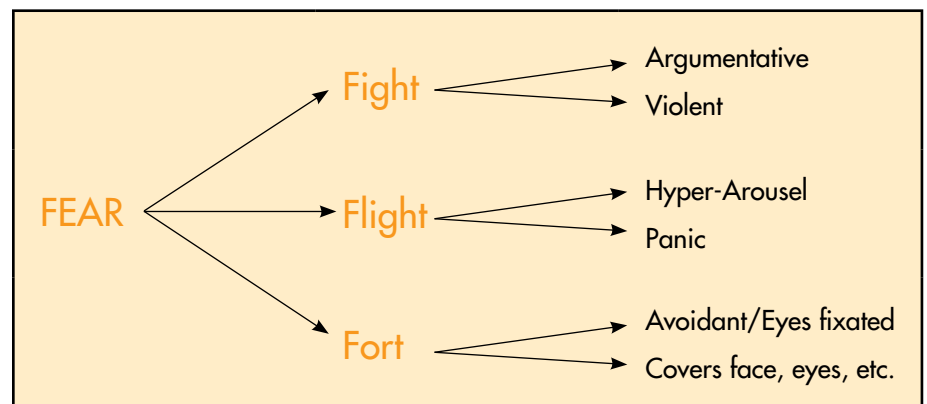
The sensory processing lens views the ability to engage in good (i.e., socially appropriate) behavior as the ability to modulate our reactions to incoming stimuli in various environments. Occupational therapists call this sensory modulation. However, many situations trigger an outsized sensory reflex, one that results in fear in individuals with ASD. So our "behavior analysis" becomes a bit more complicated. Not only do we

need to identify the root sensory processing difficulty causing the fear, we need to consider the brain dance that occurs between the primitive brain and higher cortical level functioning as they negotiate a response to this fear. We then understand that the present behavior we are attempting to analyze is a web of reflexive nervous reactions layered with learned responses. Only by unraveling this web can we truly understand the behavior and begin to develop appropriate strategies.

Fight, Flight or Fort

Consider the fear response for a moment. Is it a controlled response? No, it is a survival mechanism, and as such, is truly a nervous system response, or a reflexive response, not controlled through cognitive thought.

The response to fear (which may arise from a sensory source) is often the driver of an inappropriate behavior. We commonly describe the fear response as either *fight or flight*. I suggest there exists



¹Baranek, G. T., Foster, L. G., & Berkson, G. (1997a). Sensory defensiveness in persons with developmental disabilities. *Occupational Therapy Journal of Research*, 17(3), 173-185.

a third reaction, *fort*, characterized by a child shutting down, blocking out sensory information, in an effort to maintain control. It is my contention that fort is the most common behavior we witness in spectrum children who feel fear due to a sensory challenge. The diagram illustrates these three reactions to fear.

Educators and other professionals generally target the fight and/or flight behaviors and overlook the fort reactions in young children, often because children who fort are not usually disruptive. Forting behaviors include visually fixating or humming (auditory blockage) so the child can deal with the overwhelming sensory information or information that simply does not make sense. Keep in mind a child who is taught not to run or hit (flight or fight behaviors) may adopt fort-type behaviors because the original sensory challenge has not yet been addressed. We must continue to work with a child through these fort-type reactions until the sensory processing

difficulties have subsided. Since fort-type behavior is usually not disruptive, it often is not addressed until a child is older and starts struggling socially.

The Brain Dance

There is a continuous dance between the high road and the low road in the brains of most people. The low road, associated with the amygdala, is responsible for our primitive responses (including fear). The high road, associated with the frontal lobe, is responsible for our executive function. Executive function is the ability to conduct higher-level thinking functions such as impulse control, mental flexibility and the capacity to monitor our actions. Executive function is what allows us to add the cognitive layer to an experience to determine the correct way to respond in any situation. For many individuals with ASD this dance is more like a tug of war in which the amygdala is quicker and stronger and often wins the contest. Keeping the dance balanced is

crucial to how we modulate our behavior in all situations.

Picture the following scenario: a classroom full of children and the fire alarm (false alarm) rings unexpectedly. Everyone's amygdala triggers a fear response, which triggers a physiological reaction such as rapid breathing, increased heart rate, as well as behavioral changes as the body gets ready to run, fight or hide. Children turn toward the alarm to seek more information about the perceived threat, then the teacher waves her hands and says, "It's okay, it is a false alarm, everyone remain seated." When the children are given cognitive information about the alarm their frontal lobe processes the additional information surrounding the perceived threat and their brain realizes no danger exists. There would likely then be some rustling as the excited students try to settle themselves back into the routine. Some would use executive function strategies such as self-talk, "Oh it's nothing, I can stay put," or

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mirror back the teachers words, “No worries it was a false alarm.” Most of the students would be able to quickly return to classroom activities. Even though many of the students would still have remnants of the physiological response to fear – fast beating heart and rapid breath – their frontal lobe would help them move past the urge to run, scream, or hide under a desk.

Now let’s consider the child with ASD in that classroom. Since their fear response is faster and more pronounced they likely would have reacted to the alarm noise quicker than their classmates, perhaps with running, fighting or shutting down behaviors. And, it is unlikely that their frontal lobe processing would have dampened the fear response quickly enough to prevent a fight, flight or fort response when the teacher assured the class it was a false alarm. Even more unlikely is that this child could return to the previous task within the same time span as his classmates. The amygdala won

this tug of war and the child is still reeling from his response to fear.

For many children and adults with ASD the amygdala is hyper-responsive, which leads to greater fear responses than experienced by their peers. Compounding matters is that these same individuals struggle with frontal lobe deficits and impairments in executive function processing. This greatly impacts their ability to consider the more intricate information about a perceived threat and then use executive function strategies to problem solve. They’re too caught up in the fear experience! This may explain why most children with ASD struggle with sensory modulation.

Layered Behavior

Consider this, the behavior you observe today in most children involves a layering of experiences. It is a combination of reflexive reactions (respondent behaviors) along with learned reactions (adaptive behaviors). This cumulative layering of respondent and adaptive behaviors

makes up the library of experiences in the child’s life. The library includes the body’s reaction to those experiences (both physiological and behavioral) as well as the environment’s reaction (which can be other people) to the child at the time of the experiences.

Picky eating is a classic example of a sensory-based behavior originating from tactile defensiveness that quickly becomes a powerful learned behavior. Many children with ASD have negative reflexive sensory reactions (i.e. gag reflex) to the texture of certain foods. This reaction, for the most part, is not within a child’s control; it is a protective reaction. Parents learn not to give the child that particular food again. However, as parents we want our children to eat, so we start altering the child’s environment to ensure survival, meaning we give children the foods they will eat, and for many spectrum kids, this is a limited repertoire of foods. What happens? The child learns he won’t be asked to eat anything he



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doesn't like or want if he demonstrates his displeasure or outright refusal. The original reflexive behavior impacts the child's environment. As this simple example shows, a behavior pattern develops: gagging on a food (sensory response) leads to the child's desire not to participate in the eating activity (avoidance of negative sensory input) which leads to the parents no longer serving a particular food (altering environment) which leads to the learned behavior in the child to eat only certain foods.

Using this same train of thought, a child who displays extreme fear behaviors when asked to descend the stairs, or walk in a crowded mall, may experience a reflexive reaction to difficulties integrating movement and visual information. The likely cause of this reaction is a vestibular/visual integration challenge. If we take the historical look at how this behavior came about we see that when he was first asked to go down stairs he had a reflexive fear reaction because of problems in his visual-vestibular system. His reaction to the fear may have been him crying or running away. His parents likely picked him up and carried him down the stairs (altering the environment). Quickly the child learned that in those situations (stairs, escalators, anything involving heights), his parent will pick him up (learned behavior). Using behavior modification to get the child to walk down stairs is not enough; we have to also address the underlying sensory problem that produced his fear reaction in the first place.

Unwinding Layered Behavior

When children have severe fear responses early in life, it is important that their behavioral reactions are addressed using a layered approach that involves both sensory strategies and behavioral/cognitive strategies.

1. When determining the antecedent of behavior consider the sensory environment along with the child's sensory processing differences
2. To understand the antecedent for a behavior you see today it may be



important to ask about the child's sensory history to uncover stored antecedents (stored memories to certain experiences)

3. Think about executive function strategies you use in overwhelming or fearful situations and design strategies for children based on these. For example, create *What do I do?* social stories for a child:

- *What do you say to yourself when you hear a loud noise?*
- *What do you do if a situation gets too noisy?*
- *What do you do when there are too many people in the room?*

Stories like these provide children with scripted self-talk they can use in various situations.

4. When designing strategies to help children cope with overwhelming

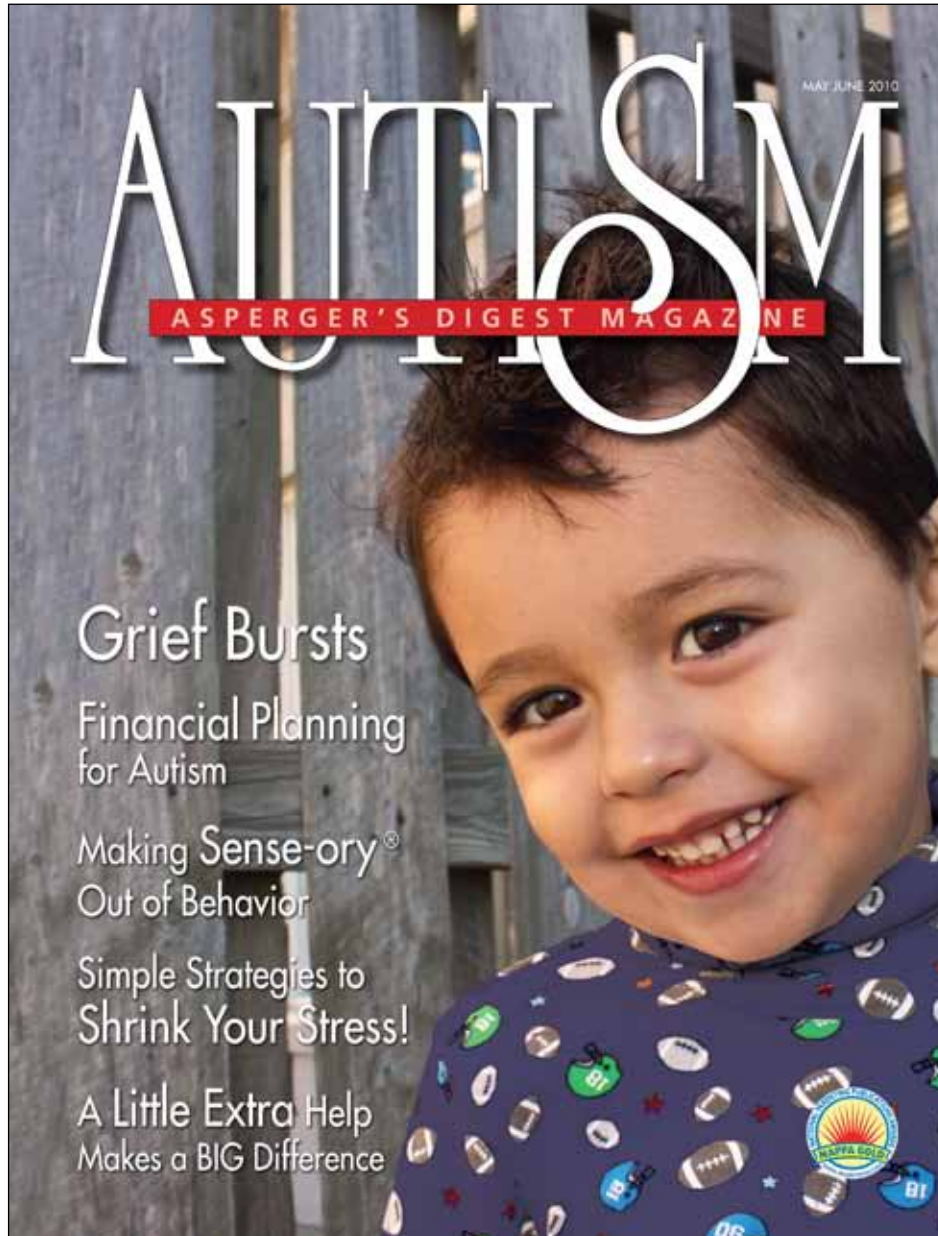
sensory situations, use bottom up (sensory strategies) as preventive measures. Use cognitive (Executive Function) strategies together to lay the groundwork to prevent future behaviors.

Stop Having Autism

In my practice today I too often see professionals trying to help a child with autism "behave" using various approaches that neglect to consider what is happening physiologically to the child. Without taking the child's fear reaction into consideration the therapist is working against the amygdala's response and expecting executive function to prevail. We might as well tell him to stop having autism. In a sense, the child is being asked to do the impossible. For this strategy to work, it must be true that all behavior is "all learned" and by offering the correct motivator it will be unlearned. It's not that simple.

Let's pretend the discussion between B. F. Skinner and Dr. Jean Ayres actually occurred and they created a new theatrical framework for viewing behavior, a framework that incorporates both the outward, observable behaviors and the inner, physiological responses that drive many of our behaviors. Furthermore, the framework acknowledges the historic component of behaviors, and the layers of experiences stored in a child's physical and mental library of functioning. All experiences are viewed as a combination of the physiological response that occurred at any given situation with what we learned from our own response and the response of the environment. Such a framework could revolutionize the way we view behaviors in autism and form an exciting new model of treatment that makes sense! Now, let's not pretend, and as professionals who work with this diverse community of individuals with ASD, turn theory into reality today. ■

Tara Delaney MS, OTR/L is Executive Director of BabySteps Therapy as well as School Steps Inc. Her latest book, *101 Games & Activities For Children With Autism, Asperger's and Sensory Processing Disorder*, is currently available in bookstores.



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