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Decreasing Behavioral Challenges Using Sensory Strategies

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DECREASING BEHAVIOR CHALLENGES USING SENSORY STRATEGIES

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Abstract

The purpose of this paper is to examine the literature that identifies how the use of sensory integration strategies can positively impact students behavior in the classroom. Students with special needs often demonstrate sensory disruptions that interfere with their ability to learn. These disruptions are often unexpected, uncontrolled, and disrupt not only the the student but other scholars in the learning environment. A student with sensory needs receiving special education services gets these needs addressed through the Individual Education Plan (IEP), collaboratively developed by a special education teacher and the occupational therapist. Unfortunately, many students have sensory disruptions in absence of a formal diagnosed disability resulting in students being punished for behaviors beyond their control. A number of sensory based interventions are examined to determine the effectiveness for students with and without any identified educational disability.

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CHAPTER I: INTRODUCTION

In the field of special education, It is common to encounter students who display significant behaviors on a day to day basis. These behaviors are often problematic and interfere with the students' ability to function in the classroom, school environment, community, and in the home. Some of these behaviors may include self-injurious behaviors (biting, head banging, hitting, etc.), aggressive behaviors (hitting, kicking, pinching, etc.), eloping or running away, and refusal, among others. Students with special needs are known to have specific sensory disruptions that interfere with their ability to learn in a classroom environment.

Imagine the first day of school in a typical kindergarten classroom. What do you see? What do you hear? What do you feel? What do you sense? Having worked in a kindergarten classroom, I can tell you that the walls are often filled with a variety of bright, bold colorful posters that scream "Welcome!" or "You Belong Here". Bombarding the ears are children laughing, screaming, desks and chairs moving against the tile floor, music playing, children tattling, and a teacher facilitating an activity. As a neuro-typical adult, a classroom of twenty or more kindergarten students can feel quite overwhelming on any given day. Now, imagine, a student with special needs entering this very same classroom. What they see? What do they hear? What do they feel? What these children sense and experience may be painful and scary compared with a child with a neuro-typical brain, or without special needs. A student with special needs may be overwhelmed by the visuals on the wall. These same visuals to them may be screaming, "This is a chaotic environment!" or "You are not welcome here!" As a result, this same student may run out of the classroom. The sounds of students laughing, or even the faint humming of the

florescent lights, may cause a student with special needs to cover their ears with their hands or use explicit language telling their peers to “shut up”. The overall feel, or sensation, of this environment may be overstimulating to the point of explosion, evoking the child's flight or fight response. Unfortunately, running out of the classroom, covering ears, and using explicit language may be perceived by teachers and staff as negative behavior or aggression rather than as sensory dysregluation.

The author of this paper teaches in a center-based program with students who have severe and profound disabilities. Sensory integration is incorporated in every aspect of the student’s day. Like many teachers, the author’s job as a teacher doesn’t end as she leaves school for the day. As a typical special education teacher, the parents of the author’s students seek her professional opinion and skills for issues found well beyond the classroom.

John is an 8-year-old boy born with Down syndrome. Like many students with Down syndrome, John displayed behaviors in and out of the classroom that interfered significantly with his ability to succeed. At John’s IEP meeting, John’s mother, Mona, expressed her concerns regarding John’s increasingly aggressive behaviors. Since John was becoming older and larger in size, Mona was having a difficult time taking John to public places. One of the most challenging routines Mona faced was getting John to cooperate while getting his hair cut. Based on the author’s demonstrated success controlling John’s behaviors, Mona asked the author to accompany them to John’s appointment. The author agreed to conduct an observation of John getting his haircut that evening and to establish an action plan for John’s haircuts.

Upon entering the facility, the author noticed several things about her sensory system. First, her visual system interpreted the colors painted on each wall as too *bright*. Each wall was a

different color and the visual simulation felt uncomfortable. For example, one wall was red, another was yellow, and a third was green. The carpet that lined the floors were blue with a vibrant design. Next, the auditory system identified the sound of the TVs playing at each hair cut station as well as the faint "buzz" of the hair clippers. The author perceived these sounds as *loud*. Then, the author's olfactory system interpreted the hair products being used as *strong* and *unpleasant* as it made her nose sting and her head ache. The author is a 29-year-old female with no known disability or any diagnosed or perceived sensory issues. As an adult with proper control of her sensory system and her bodies' response to external stimuli, the author felt overwhelmed with the surroundings and imagined how a child with a sensory disorder would do in the same situation. Fast forward to the haircut itself, John sat in the chair and was without warning strapped in by the hairdresser. John immediately screamed "No!". As the hairdresser draped the cape around John's neck, the hairs on his neck began to rise and he again screamed "no". At this point, John was crying and the haircut had not begun. As the hairdresser buzzed John's hair, the long hairs fell onto his neck. At this point, John was thrashing his body and trying to escape from the chair while yelling, screaming, and crying. The haircut lasted two minutes. Once the haircut was over, John jumped out of the chair and proceeded to take his shirt off. It was at that point that the author noticed John's skin was raised and blotchy where the long hair had fallen and met with his skin.

After seeing the discoloration and texture of John's skin, and John's behavior during the haircut, it became clear that John's somatosensory system was hypersensitive and interpreted his fallen hair as *painful*. The observation clarified that John would benefit from strategies to desensitize his somatosensory system. Gunn, Tavegia, Houskamp, McDonald, Bustrum, Welsh,

and Mom (2009) suggest a child's ability to process sensory input may play a role in the behaviors they display. Many of John's negative behavioral reactions both in and out of school are likely a direct result of his inability to process sensory input as compared with a neuro-typical individual.

So, what can we do to help ensure John's sensory needs are met in the home, school, and community environments? The answer to this requires the involvement and assistance of a licensed occupational therapist (OT). As a special education teacher, the author can consult with the OT and discuss the sensory needs of John and ask for assistance to minimize sensory disruptions across environments. For example, the OT may suggest the use of a vacuum-assisted hair clippers to minimize hair falling on John's neck while he is getting his haircut. They may also suggest that John's mother or family learn how to cut his hair so that they can complete this task in the privacy and comfort of John's home to minimize overstimulation and embarrassment in public. Regardless of what strategies are used with John, It's important to note that the author is not a licensed occupational therapist and therefore can only implement strategies explicitly prescribed and taught under the guidance and supervision of a trained and licensed OT. Implementing sensory strategies without proper training or without an occupational therapist maybe considered treating without a license.

The human body is comprised of seven commonly researched sensory systems. These include the visual, auditory, somatosensory, proprioception, olfactory, vestibular, and gustatory systems. These systems communicate with the brain where sensory input and outside stimuli is registered. Most individuals are able to register sensory input just fine. Students with neurological and cognitive differences however, often do not. These students' neurological

systems are wired so that sensory input results in overactive or under-reactive responses. According to Gunn, Tavegia, Houskamp, Mcdonald, Bustrum, Welsh & Mok (2009), these individuals are either hypersensitive or hypo-sensitive. Definitions of these terms are below.

Definitions of terms:

While reviewing the research on student behavior and the sensory system, several key terms stand out as important terms for individuals to know and understand. The terms below will help guide readers and help individuals more completely understand the sensory system and why it is important to consider when analyzing disruptive behaviors in children with disabilities.

Auditory System: The auditory system is the brain's response to stimuli obtained by the ears (hearing).

Gustatory System: The gustatory system is the brain's response to stimuli obtained by the tongue, taste buds, and saliva (taste).

Hyper-sensitive: The bodies' natural response to being over stimulated by a stimuli.

Hypo-sensitive: The bodies' lack of response to stimuli.

Neuro-typical: An individual without a diagnosed disability.

Olfactory System: The olfactory system is the brain's response to stimuli obtained by the nose (scent or smell).

Sensory Systems: The body's sensory system is made up of seven different sensory systems. These systems include the proprioceptive system, somatosensory system, vestibular system, gustatory system, olfactory system, auditory system, and visual system. Each system is responsible for the brains' response to input obtained by different parts of the body.

Proprioceptive System: The proprioceptive system is the brain's response to stimuli that occurs throughout the body's muscles and joints.

Sensory Impairment or Disorder: An inability to interpret sensory stimuli appropriately. This includes being overly sensitive to stimulation or not being stimulated enough by a stimuli.

Sensory Processing: The brain and body's response to external stimuli.

Somatosensory System: The somatosensory system is the brain's response to stimuli that occurs with touch. Skin is the receptor for this. The somatosensory system is also referred to as the body's tactile system.

Stimuli: Something that causes a response within the body.

Vestibular System: The vestibular system is the brain's response to the heads movement in space. The vestibular receptors are located within the inner ear.

Visual System: The visual system is the brains response to external stimuli obtained by the eyes (vision).

CHAPTER II: LITERATURE REVIEW

To locate the literature for this thesis, the keywords that were used were “sensory and behavior”, “autism and sensory integration”, “sensory strategies in the classroom”, “sensory integration theory”, “weighted vests”, “behavioral support” and “specific sensory techniques use in school”. The list of articles was narrowed to include only peer reviewed journals from 2008-2019. The structure of this chapter is to review the literature associated with sensory strategies in this order: Massage and Touch, Weighted Vests, Environmental Changes, Movement, Feeding Strategies, and Sensory or Behavior.

When considering student behavioral disruptions, one of the first things that erroneously comes to most educators mind is the lack of parental involvement and the type of structure or discipline children receive in their home environment. What is often overlooked, is the student’s body, brain, and the physical response to external stimuli. Behavioral disruptions in school interfere with a student’s ability to learn and remain safe. These behaviors are not only disruptive to other learners, but limit the amount of time students are learning in the classroom amongst their peers. Behavioral staff members are called to assist in behavioral management when behavioral disruptions occur. Unfortunately, this means that the student is removed from the classroom which decreases the amount of instructional time including participation with same-age peers.. However, it is often necessary to remove students from the classroom to decrease the risk of injury to themselves or others. Because of this, interventions are necessary to promote a successful learning environment, improve social interaction with peers, and increase the student’s quality of life.

Students identified with impaired neurological systems experience sensory stimulation in one of two ways. Internal or external stimuli is either too intense, or not intense enough to register. According to Bodison and Parham (2018), roughly 5% of typically developing children, and nearly 90% of children with Autism Spectrum Disorders (ASD), demonstrate sensory abnormalities. It is also estimated that one in 68 children fall on the autism spectrum (Silva et. al., 2015). It is likely that more than one student in each classroom has some form of sensory abnormality and will benefit from either environmental changes or explicit Sensory Integration Therapy. The use of Sensory Integration Therapy (SIT) has been documented for over sixty years. This therapy, originally designed by Jean Ayres, an occupational therapist, was designed to help individuals with sensory abnormalities and challenging behaviors. The goal is to decrease abnormal responses to external stimuli and increase an individual's quality of life. Sensory Integration Therapy is not the only approach used to assist with address challenging behaviors. Since Jean Ayres initially proposed this theory, many professionals have challenged this technique and its' effectiveness due to the limited number of long-term research studies to verify validity. In the educational system today, students with disabilities who display significant behavioral problems are typically evaluated by the special education team using a Functional Behavioral Assessments (FBA). FBAs are often used to evaluate problematic behaviors and determine the function of each behavior including when and where the behavior occurs most often. After an FBA has been completed, the student's special education team, including parents, develop a Behavior Intervention Plan (BIP) to decrease problematic behaviors and increase successful participation in school. Whether a child can control the disruptive behaviors is often overlooked.

Devlin, Healy, Leader, and Higher (2011) compared the use of Behavioral Intervention and Sensory-Integration Therapy in treating students with ASD who displayed challenging behaviors. In this study, four male students with ASD who displayed significant behavioral challenges, including self-injurious behaviors, were assessed using an alternating approach of both behavioral interventions and sensory integration therapy. Devlin, Healy, Leader, and Higher (2011) found that student problematic behavior overall decreased when using behavioral intervention approach versus the sensory integration approach. This does not mean that the SIT approach doesn't work to decrease sensory sensitivities or problematic behaviors in other children. Although the behavioral intervention approach in this study proved most effective in decreasing problematic behavior with this group of students with ASD, sensory integration therapy should be considered as a tool to prepare the body's sensory system to response to external stimuli.

Massage and Touch

The human body is comprised of multiple sensory systems. These systems are activated by receptors throughout the body and our responses to these sensations are often difficult to control. Children with disabilities demonstrating challenges regulating their bodies' response to sensations beyond their control. Many students with disabilities have sensitivities to touch. The tactile system, also referred to as the somatosensory system, in the human body is made up of sensory receptors spreading from the top of the head, to the tip of the toes. The tactile system perceives stimulation as *too hot*, or t*oo cold*. This system also interprets pressure through touch as *painful* or *pleasureful*. A student whose tactile system is hypersensitive to touch may interpret

the tag on the inside of the clothes as painful. This same student may interpret a light graze by a peer as *unacceptable* whether it was intentional or not. Hypo-sensitivity to touch among children with sensory abnormalities is common. Hypo-sensitivity to touch can often be dangerous for these individuals as they may not register sensations as *painful* or extreme temperatures as *dangerous*. When children have a hypo or hypersensitive tactile system, maneuvering throughout the school day can be particularly difficult because touch is unavoidable.

Bodison and Parham (2018) conducted a systematic review of specific sensory techniques and modifications made to environments for children with sensory abnormalities. The authors examined over 11,000 articles on the effectiveness of sensory interventions for children with sensory abnormalities in the home and school settings. More specifically, the authors researched these articles based on the children's diagnosis of either ASD or Attention Deficit Hyperactivity Disorder (ADHD). Sensory techniques such as the Qigong massage, the use of weighted vests, swings, and environmental modifications were evaluated for the effectiveness on improving sensory related dysfunctions. Each of these sensory techniques are widely used in schools today as standard sensory interventions. Some have proven more beneficial than others in increasing on-task behavior and to desensitize tactile stimulation with individuals that are hypo-sensitive. The Qigong massage is an old technique that continues to be utilized primarily for children with ASD (Silva et. al., 2015). The Qigong massage method consists of applying deep pressure to the shoulders, neck, and back, along with repetitive patting, that aims to decrease tactile sensitivities and improve self-regulation (Bodison and Parham, 2018). This strategy is unique in its ability to calm the somatosensory system of a child with tactile sensitivities and is often used by occupational therapists, and parents. In this study, occupational

therapists received extensive training on the Qigong massage and trained families of students with ASD so they could implement this intervention at home. The authors found that parents of children with ASD who had been receiving Qigong massage over the course of five months, reported great benefits for their children as shown by decreased tactile sensitivities and increased ability to self-regulate (Silva et al., 2015).

Similarly, McCormack, G. L., and Holsinger, L., (2016), evaluated the effectiveness of comforting touch, a technique used by parents, to soothe children diagnosed with ASD. When a child becomes upset, the parents natural response is to provide children with touch to promote a sense of comfort and safety. Because children with ASD are often hypersensitive to tactile stimulation, they have a difficult time interpreting touch as pleasure and comfort. To a child with a disability, touch may be upsetting or painful causing the body to move into a state of dysregulation. McCormack & Holsinger (2016) recruited 25 first time parents with children diagnosed with ASD between the ages of one and six. The control group consisted of 26 first time parents of children ages one through four with children with no known disabilities. Parents in both the control group and the autism group were asked to complete a questionnaire that consisted of multiple open-ended questions illustrating the different ways they soothed their upset children. The authors hypothesized that the parents of children with ASD would suggest they had a more difficult time soothing their children with comforting touch when compared with parents of children with no known diagnosed disability. After reviewing the parents' responses to the questionnaire, the children with ASD took longer to console compared with the children with no known disabilities. Parents in the autism group reported more difficulty in finding ways to soothe their upset child compared to the parents in the control group. Parents in

the ASD group also reported that auditory and visual stimuli often provided their children with more comfort than when using tactile stimulation. The control group suggested that children are often soothed with hugs, kisses, and being picked up by their caregiver (McCormack and Holsinger, 2016). Children in the ASD group were more likely to reject comforting touch by their caregiver, therefore taking longer for the caregivers to find ways to soothe them. According to the authors, parents in the ASD group reported that their children were more likely to be calmed by visual or auditory input. The reason for this, according to the authors, was do to the brain's response to rhythm and repetition (McCormack and Holsinger, 2016).

Weighted Vests

In the review conducted by Bodison and Parham (2018), the authors examined children's use of weighted vests as a sensory strategy for calming and regulating behavior through their proprioceptive and somatosensory systems . Unfortunately, the authors found limited evidence to suggest the effectiveness of these vests for children with sensory abnormalities yet, the use of these vests continues to be standard practice as evidence by the many anecdotal reports of positive benefits. Authors Cox, Gast, Luscre, and Ayres (2009) examined the use of weighted vests on three children with ASD and intellectual disabilities and the impact on student's in-seat behavior in the classroom. Participants included three school-aged children, two male and one female, who all required multiple redirections from staff members to stay seated during classroom instruction. Student behaviors were monitored and assessed in a self-contained special education classroom during group instruction. Students wore vests with 5% of their body weight evenly distributed throughout the pockets. The student behaviors included stereotypical

behaviors such as self-stimulated rocking, hand flapping, vocalizations and self-injurious behaviors. The authors found that in-seat behavior did not significantly increase when the students wore the vests. The researcher used a highly motivating object or toy to conduct the second experiment. Students could hold a highly motivating object during group time and only had to put it down when they were required to participate in a task. The results of this experiment showed that the students in-seat behavior increased greatly with possession of a preferred object.

With this premise in mind, Hodgetts, Magill-Evans, and Misiaszek (2010) examined the use of weighted vests and the effects it had on decreasing behaviors and arousal in children with ASD. The targeted behaviors in this study were referred to as stereotype behaviors, which meant behaviors often seen displayed by children who have been diagnosed with ASD. These behaviors included hand flapping, flicking, scratching, rocking and verbal echolalia (repetitive talk). Participants in this study included six children, five boys and one girl. All children ranged between four and ten years old and had a medical diagnosis of ASD. Weighted vests were used in the children's center-based, self-contained classroom while they were seated and engaged in a fine motor task. The authors measured the students' heart rates prior to the activities and while wearing the weighted vests to determine whether wearing the weighted vests influenced heart rates. The authors found no change in heart rate in five of the six participants. One participant's heart rate increased while wearing the vest while all others remained the same. There was no significant change in overall student behavior, but one student was observed to decrease the amount of verbal echolalia. The findings suggested that the use of weighted vests did not decrease stereotypical behavior in children with ASD.

Even with limited in research supporting the use of weighted vests in the school setting, occupational therapists and special education teachers continue to use this tool to assist students with sensory needs. The vests however, are not the only tool used in the classroom to assist with sensory organization. Recently the use of weighted blankets has grown increasingly popular among individuals with and without disabilities. Considerations for the use of a weighted blanket or vest include that the blankets can be very expensive and their use must be prescribed and monitored by an OT to determine the therapeutic value.

Environmental Changes

Sensory over-responsiveness to multiple incoming stimuli is also common among students with disabilities. Imagine walking into a school cafeteria during lunch period. The large space, bright lights, crowded tables, and aroma can be overstimulating for any person. Now, imagine walking into this same setting as a child with a disability. The body's natural response to overstimulation is to avoid, elope, or escape. According to Ben-Sasson, Carter, and Briggs-Gowan (2009), sensory over-responsivity to multiple environmental stimuli can interfere with a child's ability to perform and participate in different activities in the school setting. These sensory over responsivities not only interfere with the child's ability to preform academically, but impact social situations as well (Ben-Sasson, Carter, and Briggs-Gowan, 2009). In a study evaluating sensory over-responsivity in elementary school children, Ben-Sasson, Carter, and Briggs-Gowan (2009) examined sensory over-responsivity and social and emotional outcomes in typically developing children. The parents reported their children's issues with tactile sensitivities included sensitivities related to clothing, haircuts, nail trims, and finger painting. According to

the authors, behavioral outcomes associated with sensory sensitivities often become more pronounced in children as they enter the school setting. One considers why these behaviors tend to occur when students enter school and appear less often at home? According to the authors, these behaviors tend to occur more frequently at school because children have less control over the environment and they experience more stimuli than they do in the home environment (Ben-Sasson, Carter, and Briggs-Gowan, 2009).

In the classroom, teachers wonder how they can adapt the environment to suit the needs of individual students. Walking into a special education classroom, one might notice blue filters over the florescent lights. This is to dim the bright light which promotes a calming, less arousing environment (Mays, Beal-Alvarez, and Jolivette, 2011). Seating selection in the special education classroom may not include desks or chairs arranged around a table, but instead may consist of wiggle seats, therapy balls, adaptive chairs, and desks with dividers. One might ask why this is more common in special education classrooms than in general education classrooms. A child should initially be considered general education students, regardless of ability level, and have access to modifications and accommodations that research has proven beneficial.

A study by Schilling and Schwarz (2004) examined alternative seating and the effects on children with ASD and classroom behavior. Children in an integrated preschool class were studied while using the typical form of classroom seating (carpet, chair, etc.). The use of an exercise ball as a seat was also examined to determine the effect on classroom behavior and performance. The authors found that the use of the therapy ball not only improved behavior and performance, but the teachers and parents reported improvements in other areas as well. In one case, the teachers noticed a decrease in a student's drooling behavior. In another case, the teacher

suggested that the student sit independently during circle time without paraprofessional or adult support (Schilling and Schwartz, 2004). Although this study proved therapy balls useful with performance and behavior, it did not indicate why the students showed such a large improvement.

Gains and Curry (2011) examined students visual systems and the effects color had on learning and behavioral outcomes. According to the authors, the use of warm colors such as beige, green, blue, and brown can be beneficial to promote a calm and productive learning environment. Bright colors such as red, orange, white, and yellow may over stimulate an individual's visual system causing less productivity. In classrooms today, many teachers use blue filters to cover bright florescent lights. This dims the bright light and may decrease overstimulation in students who are hyper-sensitive to visual stimulation. Keis, Helbig, Streb, & Hille (2014) examined the use of blue-enriched white light and student performance. In this study, 58 students were evaluated in and out of blue-enriched white light environments. Results of this study suggested that blue-enriched white light positively influenced student performance and level of concentration (Keis, Helbig, Streb, & Hille, 2014). Similarly, Barkmann, Wessoloqski, & Schulte-Markwort (2012) found that the use of variable lighting in the classroom had positive effects on reading performance including speed and comprehension in school-aged students.

Movement

Schilling and Schwartz (2004) found that participation increased and behaviors decreased when students used therapy balls. Sitting on a therapy ball provides the opportunity to bounce, balance, and rock. Bouncing provides the body with vestibular input. Vestibular input positively

impacts emotional control, self-regulation, and increased concentration. With this premise in mind, Mays, Beal-Alvarez, and Jolivette, (2011) examined the use of movement and the impact it had on students with ASD. One case study involved a boy named Bobby. Bobby had repetitive behaviors that included bouncing throughout the day. The bouncing provided him with the vestibular input his body needed, but it became a problem because he was unable to complete academic tasks and he was distracting other classmates. After five days of using a therapy ball, the teacher reported that Bobby bounced to avoid completing his work. Bobby's classroom performance including his ability to attend and participate increased after this intervention was adjusted to provide Bobby with intermittent bounce breaks. This strategy was also less distracting for other students in the classroom (Mays, Beal-Alvarez, and Jolivette, 2011).

Vestibular interventions can also be provided by rocking, bouncing, and swinging. Vestibular input activities however, must be approved, monitored, and supervised, by a licensed occupational therapist. Too much vestibular input can cause nausea and nystagmus, an involuntary eye movement causing the eyes to move rapidly back and forth. According to Wen-Ching Su, Chin-Kai Lin, and Shih-Chung Chang (2015), the presence of nystagmus is one way to determine if a child presents abnormalities with vestibular input. In their 2015 the study, Wen-Ching Su, Chin-Kai Lin, and Shih-Chung Chang examined the use of swing rotation with kindergarten children in Taiwan. The purpose of this study was to determine a safe and therapeutic number of rotations for a child using a rotation swing. The authors found that about 10 rotations was the safe range for students using to a rotation swing, or disk.

Feeding Strategies

The gustatory system in the human body is responsible for the sense of taste. It consists of the mouth, tongue, and saliva. The olfactory system in the human body is responsible for the sense of smell. When food is presented, the brain interprets the flavor as either pleasant or unpleasant due to input from both the gustatory and olfactory system. A human can often tell if they are going to enjoy the taste of a food long before the food enters the mouth. This is due to the olfactory system, or the nose smelling the cuisine. Children tend to have a sensitive gustatory system which may explain why children tend to enjoy bland foods with little flavor (Seiverling et al., 2018). Parents often assume that when children refuse food its because they do not enjoy the flavor. This could be the case, but parents and educators may not consider texture and consistency. Food with unusual texture can cause any child to refuse regardless of the flavor. Broccoli is much easier to eat when cooked and is often soft and flavorful. When paired with melted cheese, many children will consume it. Raw broccoli, on the other hand is hard, dry, and the florets on the top are often gritty and get stuck in teeth. Children may be willing to eat broccoli that is cooked but refuse uncooked broccoli due to the texture, smell, and consistency. Children with disabilities often have sensitive gustatory systems (Seiverling et al., 2018). A child with Down syndrome may have a difficult time consuming cold broccoli due to low muscle tone, which makes chewing food more difficult. Children with autism may not have chewing issues but may be increasingly sensitive to different types of food due to intense flavors and textures. When children with gustatory sensitivities come in contact with certain foods, their automatic response may be to gag, vomit, cry, refuse to eat, or tantrum. In schools, special education teams often turn to occupational therapists to assist in developing a system or a protocol to assist with

food aversions. Tools such as the Z-vibe are widely used to stimulate the child's mouth to prepare for feeding. Tooth brushing is another oral desensitization strategy widely used in schools to aid in the tolerance of food textures.

Addison et al. (2012) suggests children with sensory feeding problems not only resist eating, but also may also display behaviors such as spitting foods out, gagging, coughing and etc. In special education, occupational therapists introduce new foods to students systematically by developing a sensory-based feeding plan. Under the guidance and supervision of an occupational therapist, a paraprofessional, teacher's assistant, special education teacher, or parent/caregiver may carry out plans to help desensitize the student's gustatory system to increase tolerance and acceptance of an increased number of foods.

Addison et al. (2012) attempted to decrease inappropriate feeding behaviors and increase food acceptance using components of sensory integration theory with two students identified with feeding abnormalities (Addison et al., 2012). In the study, occupational therapists trained feeding assistants to incorporate components of sensory integration therapy while feeding two children with food sensitivities. The feeding assistants carried out the protocol in attempt to increase food acceptance (eating), and decrease inappropriate behavior (refusal, gagging, spitting food out, vomiting, etc.). Addison et al. (2012) suggested that some occupational therapists believe that overall sensory integration might benefit children because all sensory systems in the body interact in sync. For example, in this study, the occupational therapist developed a protocol that included joint compressions, brushing, bouncing on a ball, and vibration (Addison et al. 2012). In each of the sensory protocols, sensory integration was performed by therapists systematically throughout the day instead of just before or during feeding. All foods were pureed

and a small amount was placed in the child's mouth using a rubber spoon (Addison et al. 2012). The authors found that the sensory integration techniques had little affect on food acceptance.

Similarly, Seiverling et al (2018) conducted a study comparing behavioral feeding interventions and sensory integration therapy to determine which intervention was the most effective in decreasing food avoidance and increasing food consumption. Two children with ASD participated in this study. Both children displayed some food sensitivities and feeding challenges such as turning the head away when food was presented. One of the participants received nutrition primarily through a baby bottle full of milk or high calorie formula (Seiverling et al., 2018). Two feeding therapists and a behavioral analyst assisted in the delivery of this study. During the behavioral intervention portion of this study, the feeding therapist encouraged children to open their mouth and when they did, food was inserted in their mouth using a feeding utensil. Once the child's mouth was empty, the child was rewarded with a preferred object for 10-20 seconds. During the sensory integration portion of this study, the feeding therapists implemented a sensory integration activity 15 minutes before the feeding session began (Seiverling et al., 2018). The results of this study were similar to the previous study by Addison et al. (2012) which showed that behavioral interventions were more effective than the sensory-based strategies regarding food consumption. However, in this study, Seiverling et al. (2018) suggested that sensory-integration positively affected the children's ability to transition to a highchair and remain seated during feeding time.

In the educational setting, occupational therapists typically lead the special education team with the development of food protocols for children with food sensitivities. Many children with disabilities have some food related abnormalities that require intervention or attention.

Although the sensory-based interventions in these two studies did not prove to increase the amount of food consumed, these strategies are widely used in schools and clinics to address children's feeding problems.

Sensory or Behavior?

When people think about sensory abnormalities, they think about individuals with disabilities such as ASD, attention-deficit/hyperactivity disorder (ADHD), Down syndrome, and those with developmental delays. It is common that children and adults have some level of sensory defensiveness in the absence of any other diagnosis. Reynolds and Lane (2007) reviewed the literature and case reports and determined that sensory abnormalities and dysfunctions can exist in the absence of a corresponding medical or behavioral diagnosis. In schools, many children without an Individual Education Plan (IEP) may have sensory abnormalities but they are overlooked because the children do not have an underlying disability or diagnosis. Because these children are identified as neuro-typical and do not qualify for special education services, they most likely do not benefit from the knowledge and expertise of an occupational therapist and may silently struggle with sensory abnormalities. It's possible that these students may represent what teachers refer to as "high flyers" in classrooms because they display a significant number of behavior problems. Conversely, some of these students may represent the "unmotivated" students who appear tired or lethargic because they do not receive enough sensory input. Reynolds and Lane (2007) examined three case studies of children who appeared to have tactile defensiveness and motor issues. All children were without a diagnosis but their parents reported

that sensitivities interfered with routines and daily living tasks. Reynolds and Lane (2007) suggested that sensory over-responsivity was the diagnosis.

May-Benson & Koomar (2010) reviewed twenty-seven studies that examined the effectiveness of sensory intervention strategies in children who demonstrated sensory disruptions. The authors suggested that previous research promoted the use of sensory-based interventions to assist with motor planning (May-Benson & Koomar, 2010). According to the authors, five of the research articles suggested that sensory-based strategies promoted positive results with students diagnosed with a learning or intellectual disability. The authors also noted that the results of these studies suggested that sensory intervention strategies were better than no intervention at all (May-Benson & Koomar, 2010). Student performance, according to the authors, was also influenced by the amount of time spent receiving sensory interventions with an occupational therapist. Students who received sensory integrated interventions showed increased self-esteem and decreased internal and external behavior problems (May-Benson & Koomar, 2010). Although targeted strategies were beneficial to some students with significant behavioral problems, the authors suggested that providing sensory integration strategies continued to be better than no intervention at all (May-Benson & Koomar, 2010).

Yunus, Liu, Bissett, & Penkala (2015) reviewed sensory-based interventions for children with behavioral disturbances. The authors reviewed 14 studies that addressed sensory-based interventions in vestibular, tactile, and proprioceptive areas. The underlying premise that behavioral problems resulted from an interference in an individual's sensory system was the focus of each of the articles reviewed. The behaviors included hand flapping, fidgeting, finger flicking, anxiety, impulsivity, inability to attend, restlessness, and hyperactivity (Yunus, Liu,

Bissett, & Penkala, 2015). The theory of sensory dysregulation is consistent with Ayres Sensory Integration Theory. The article review represented 298 participants all with a diagnosed disability, with the majority of the participants diagnosed with ASD. The authors found that tactile interventions, such as massage, were proven to be the most beneficial. These interventions included the Wilbarger brushing protocol and touch therapy (Yunus, Liu, Bissett, & Penkala, 2015). The findings demonstrated that each intervention strategy, under the guidance and supervision of a trained occupational therapist, proved successful in decreasing behaviors and organizing the sensory system (Yunus, Liu, Bissett, & Penkala, 2015). The authors suggested that the use of proprioceptive interventions, such as the use of weighted vests, did not prove to successfully address problematic behavior. Vestibular interventions including horseback riding and using therapy balls were proven effective in decreasing stereotypical behaviors in students with ASD.

CHAPTER III: Professional Application

Many school districts employ a limited number of service providers such as occupational therapists, to provide services to students who qualify. However, these service providers are often required to provide services to many students, across multiple schools. Because of this, occupational therapists have limited time to collaborate. As a special education teacher, I work closely with service providers to ensure the needs of my students are met. I have found throughout the years working in an elementary school, that occupational therapist are limited in the amount of time available to spend collaborating outside of providing direct services for their students. Because the demand of their position is so high, occupational therapists have limited availability to share sensory strategies to other facility members throughout the building.

As a special education teacher, general-education teachers come to me with questions regarding their student's problematic behaviors, whether they have a diagnosed disability or not. After observing student behaviors in the classroom, I find myself encouraging educators to connect with the school occupational therapist to determine if these behaviors are sensory related. Because of this trend, I have created an *informational only* powerpoint presentation for school facility members so they have a better understanding of sensory needs and how these needs can influence student behavior.

To begin this presentation, I will ask questions such as, *what behavior's do you see in the classroom and how do you approach them?* Next, I will discuss information obtained while researching student behavior and the sensory system. For example, I will explain that many negative behaviors students display may be a result from an under-response or over-response to

external stimuli. Next, I will discuss student behaviors and what they may look like in the classroom.

The main purpose of this slideshow presentation is to give educators an idea of what some of their students may be experiencing internally, as they externally display problematic behaviors. To start, I will ask my professional peers to close their eyes and imagine themselves walking into the school cafeteria. The dialogue script will read: *Imagine yourself walking into the school cafeteria. What do you see? What do you hear? What do you feel? Is it bright, perhaps crowded? Is it loud? Are students sitting directly next to you (maybe even touching elbows)? What if you had a horrible headache and you had lunch duty? How do you imagine yourself feeling? Now, imagine it is your least favorite lunch, shrimp poppers and Brunel sprouts. What do you smell? Is it pleasant? Unpleasant? Now, imagine yourself taking your first bite of shrimp poppers. Notice the temperature? Now take a bite of a Brussel sprout. Notice the texture? Open your eyes. Congratulations! You survived the cafeteria! As a neuro-typical individual, braving the cafeteria may not seem like a big deal. Yes, it may be loud and a bit crowded however, you have self control so these things don't bother you*.

The purpose of this script is to encourage educators to consider the school environment and how that can contribute to student behavior. Next, I will read the same script but this time, I will ask my professional peers to think of this same scenario but as a child with ASD who has sensory sensitivities. The script will read: *Close your eyes a second time and this time Imagine yourself walking into the same cafeteria only this time, you're a student with ASD. You're sensitive to bright lights and loud noises. You're not a huge fan of crowds and you have social anxiety. The foods you consume are limited due to the strong tastes and textures. The cafeteria*

worker tells you that everyone must take a vegetable and puts broccoli on your tray. The student next to you is rough housing with his buddy and keeps bumping you. The cash register beeps loudly as the students type in their lunch number and the cafeteria supervisor is screaming for the students to BE QUITE. The custodian slams the milk crates on the floor and the bell rings.

The next portion of the slideshow presentation will discuss the human sensory system and what each system does within the body. Prior to researching this topic, I had limited understanding of the sensory system. After completing the research, I have found that the human body is made up of seven different sensory systems. I will briefly touch on each sensory system but will highlight four to discuss more in-depth.

The first sensory system I will discuss is the vestibular system. This system is responsible for the heads movement in space. This sensation is made possible by the inner ear. Research suggests that the vestibular system can be stimulated by: Swinging fast on a swing, movement quickly, bouncing, and spinning Mays, Beal-Alvarez, and Jolivette, (2011). The vestibular system may be calmed by: Slowly swinging, moving slowly, and rocking (Bodison and Parham, 2018). Students who have hyper-sensitive vestibular systems may feel light headed or nauseas while participating in these activities Wen-Ching Su, Chin-Kai Lin, and Shih-Chung Chang (2015).

The second sensory system I will discuss is the tactile system, also known as the somatosensory system. Research suggests that sensations such as light touch and cold temperature can stimulate the tactile system (McCormack, G. L., & Holsinger, L., 2016). Stimulation such as a feather lightly touching the surface of skin or the manufacture tag on the inside of clothing, may stimulate the tactile system too much resulting in the sensation of *pain*

(Bodison and Parham, 2018). Pressure applied on the skin may however stimulate the tactile system adequately resulting in the feeling of *pleasure* (McCormack, G. L., & Holsinger, L., 2016).

The third sensory systems I will discuss is the auditory system. This system is responsible for sound. Students with ASD who have hyper-sensitive auditory systems may interpret loud noises or high volumes as *painful* and those who have hypo-sensitive auditory systems may not (Bodison and Parham, 2018). Multiple individuals talking at once may also be perceived by hyper-sensitive individuals as *loud* or *distracting*. Some of these individuals may have a very sensitive auditory system and even the faint buzz of environmental noise, such as the hum of a furnace, may be bothersome. Students with hypo-sensitive auditory systems may enjoy loud noises, high volume of sound, and may even enjoy making loud noises themselves.

The last sensory system I will discuss is the visual system. This system is responsible for sight. Students who have hyper-sensitive visual systems may be bothered by bright lights (Mays, Beal-Alvarez, and Jolivette, 2011). These individuals may prefer the lights in the classroom to be dim, or even filtered (Keis, Helbig, Streb, & Hille, 2014). These same individuals may require the use of sunglasses when outside, even on a day when others are not affected. Hypo-sensitive individuals may prefer the use of bright lights, vibrant colors, and high contrast visuals to encourage participation.

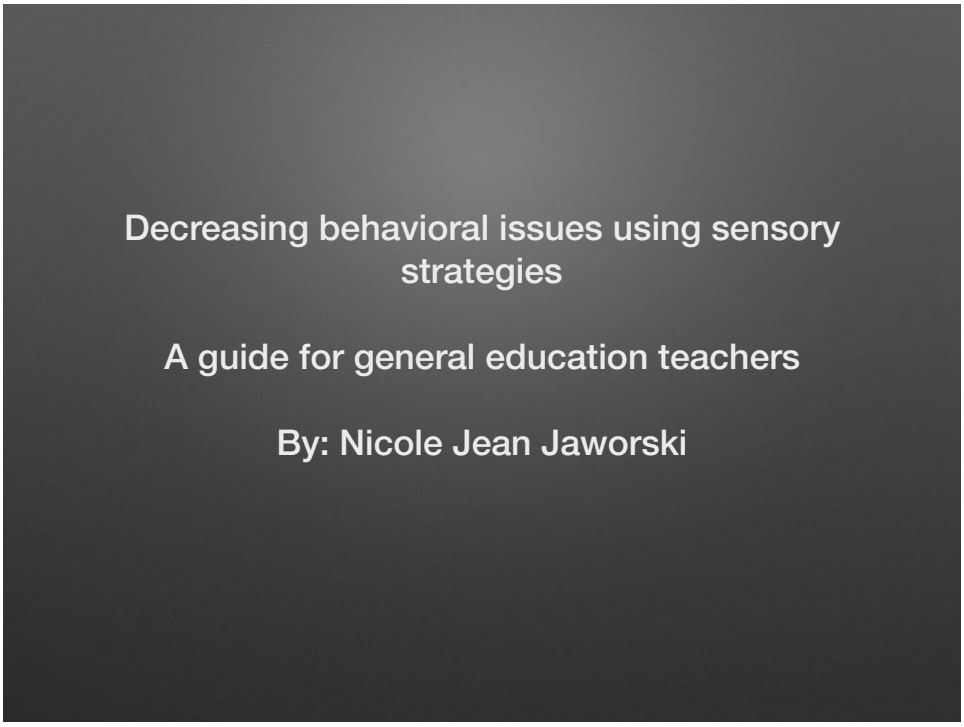
After discussing the sensory systems, I will ask my professional peers to think of a student with problematic behaviors in their classrooms. Next, I will ask: *What are his/her behaviors? How do they interfere with his/her daily life? How do they interfere with classroom performance? How often do these behaviors occur? Where do these behaviors occur?* Last, I will

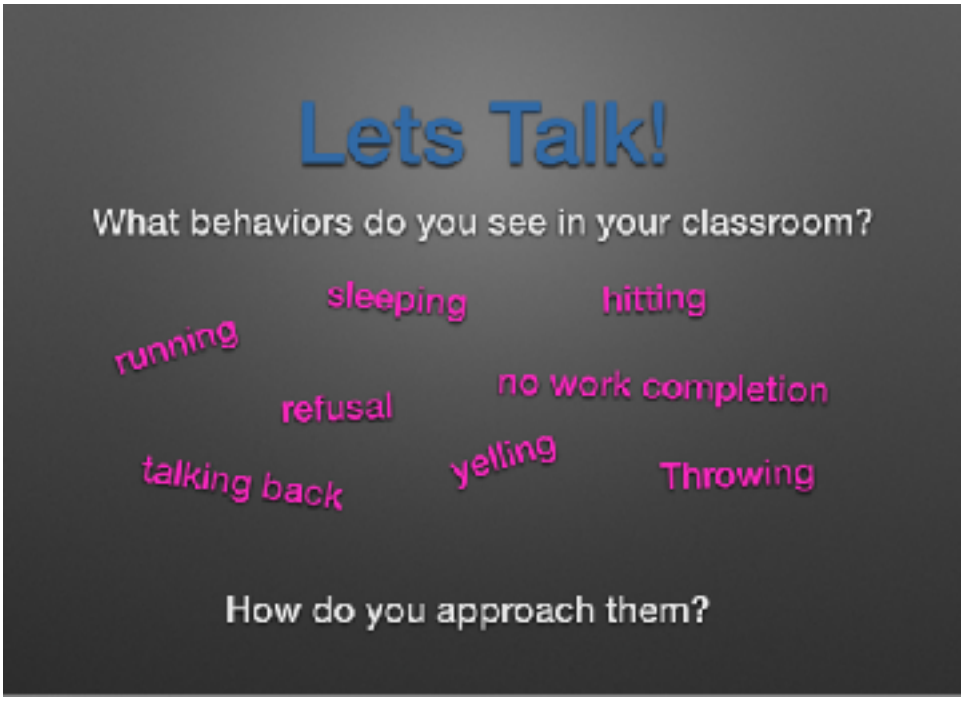
encourage my peers to think about these questions and determine if any of these behaviors may have been a result of a sensory irregularity.

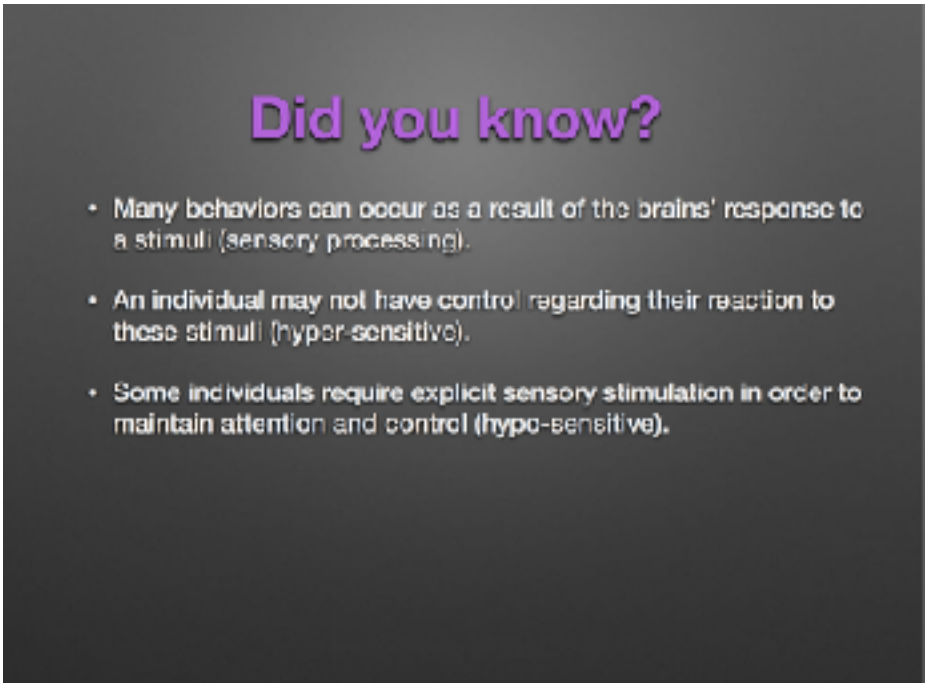
Finally, I will discuss how all students, regardless of ability, may benefit from sensory based interventions. For instance, in the beginning of the school year, teachers (knowing what they know now) can arrange their classroom with the sensory system in mind. Perhaps they incorporate flexible seating options for their students such as the use of bean bags, exercise balls, sofas, and more. Teachers may even use lamps instead of the use of overhead florescent lighting. If this is not an option, perhaps the teacher can cover the florescent lights with blue filters or only choose to use half of the lights in the classroom.

According to the Centers for Disease Control and Prevention (CDC) website, approximately one and 59 children are diagnosed with ASD (Center of Disease Control and Prevention, 2014). In an elementary school that houses around 600 students, that means roughly ten or more students within that school has been diagnosed with ASD. What I find, as a special educator, is that many general educators have very little knowledge about student specific disabilities. This slideshow will not only help those educators who have one of the eleven students in their classroom, but all educators who have had, or will have, students with ASD in their classrooms.

Slideshow Presentation for General Education Teachers

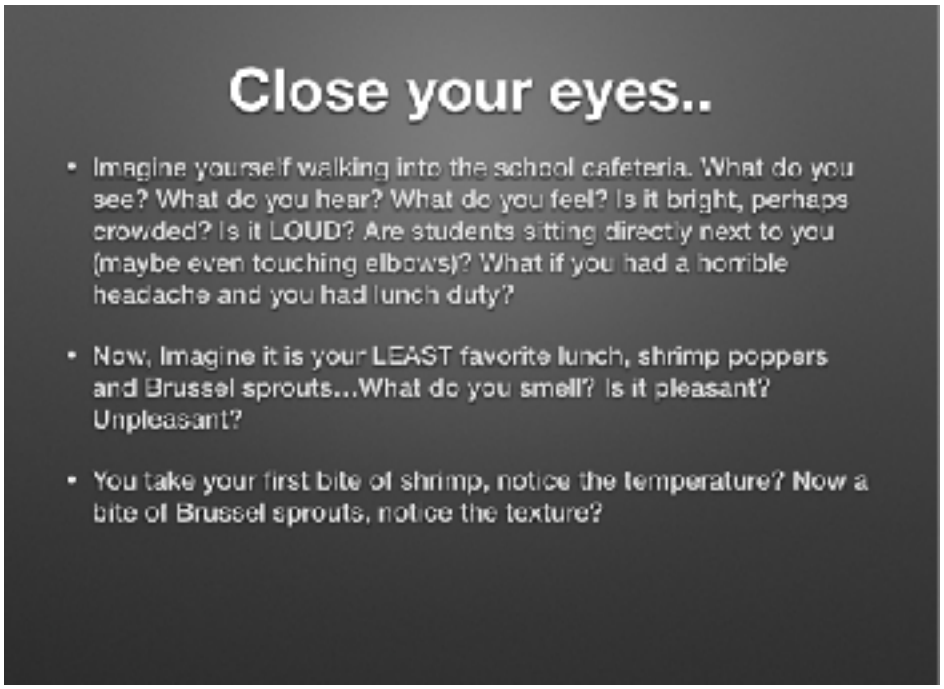


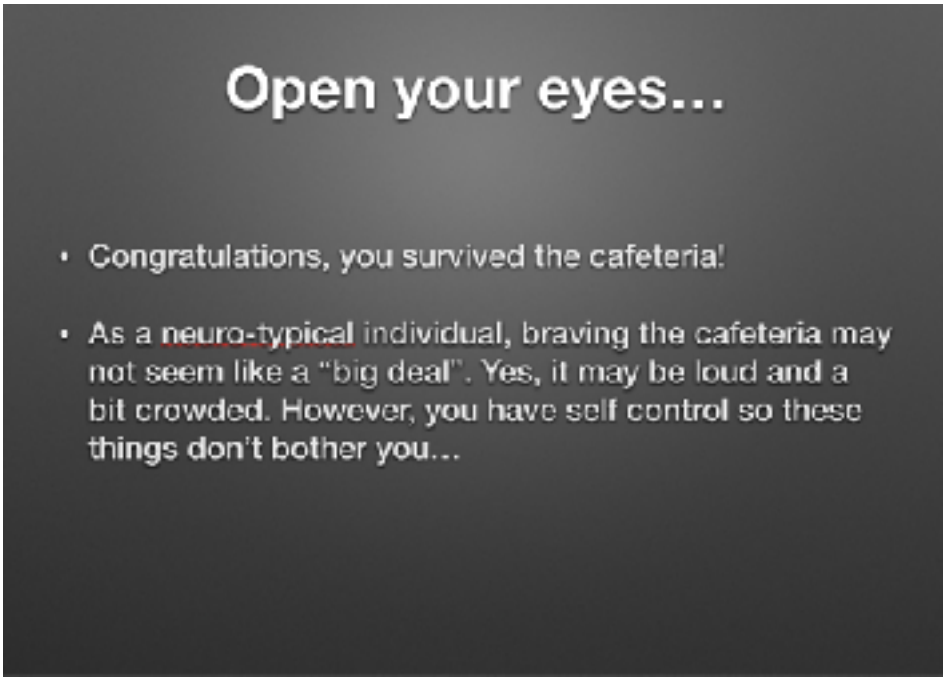


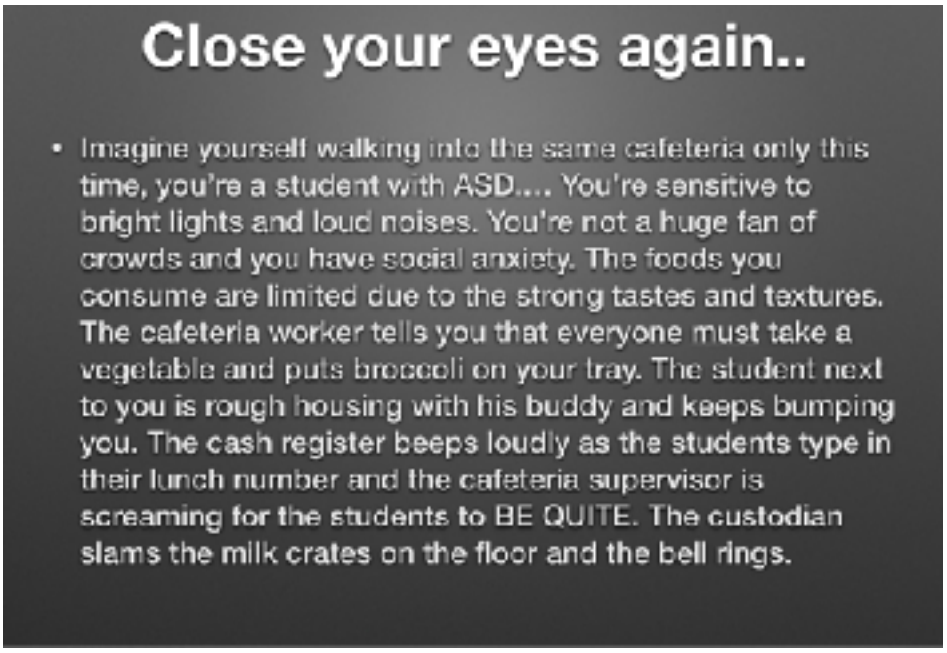

Did you know?
• Many behaviors can occur as a result of the brains' response to a stimuli (sensory processing).
• An individual may not have control regarding their reaction to these stimuli (hyper-sensitive).
• Some individuals require explicit sensory stimulation in order to maintain attention and control (hypo-sensitive).

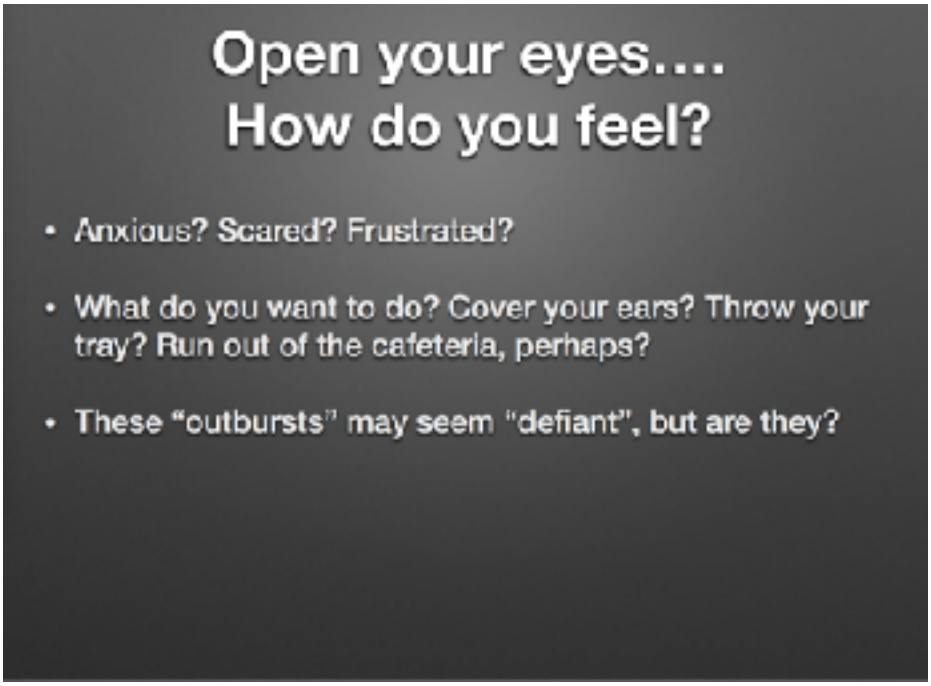

Behaviors may include…
• RockingHand/Arm Flapping
• "Plopping"
• Biting
• Throwing body into objects (walls, desks, tables, chairs, etc.)
• Head banging
• Screaming
• Hitting
• Kicking
• Refusal (covering ears, eloping, etc.
• Spitting
• Etc.

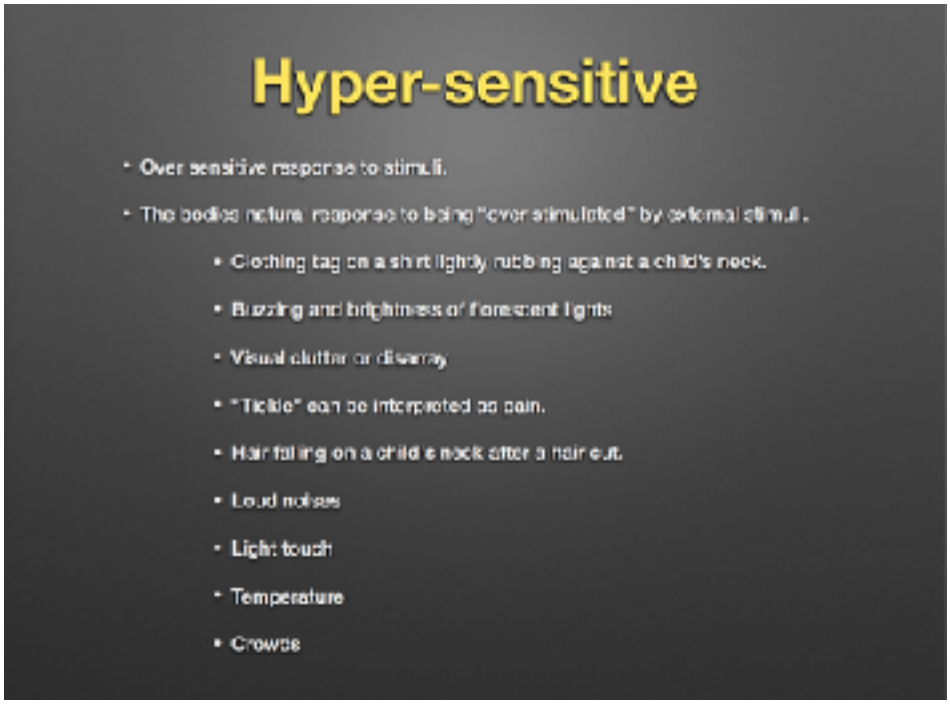

Behaviors may also include…
Less "obvious" behaviors:
Falling asleep
Fidgiting
Appear restless
Eloping
Closing eyes
Falling asleep


Close your eyes..
Imagine yourself walking into the school cafeteria. What do you see? What do you hear? What do you feel? Is it bright, perhaps crowded? Is it LOUD? Are students sitting directly next to you (maybe even touching elbows)? What if you had a horrible headache and you had lunch duty?
Now, Imagine it is your LEAST favorite lunch, shrimp poppers and Brussel sprouts…What do you smell? Is it pleasant? Unpleasant?
You take your first bite of shrimp, notice the temperature? Now a bite of Brussel sprouts, notice the texture?


Open your eyes…
• Congratulations, you survived the cafeteria!
• As a neuro-typical individual, braving the cafeteria may not seem like a "big deal". Yes, it may be loud and a bit crowded. However, you have self control so these things don't bother you…


Close your eyes again..
• Imagine yourself walking into the same cafeteria only this time, you're a student with ASD…. You're sensitive to bright lights and loud noises. You're not a huge fan of crowds and you have social anxiety. The foods you consume are limited due to the strong tastes and textures. The cafeteria worker tells you that everyone must take a vegetable and puts broccoli on your tray. The student next to you is rough housing with his buddy and keeps bumping you. The cash register beeps loudly as the students type in their lunch number and the cafeteria supervisor is screaming for the students to BE QUITE. The custodian slams the milk crates on the floor and the bell rings.


Open your eyes....
How do you feel?
• Anxious? Scared? Frustrated?
• What do you want to do? Cover your ears? Throw your tray? Run out of the cafeteria, perhaps?
• These "outbursts" may seem "defiant", but are they?


Hyper-sensitive
• Over sensitive response to stimuli.
• The bodies nature response to being "over stimulated" by external stimuli.
• Clothing tag on a shirt lightly rubbing against a child's neck.
• Buzzing and brightness of florescent lights
• Visual clutter or disarray
• "Tickle" can be interpreted as pain.
• Hair falling on a child's neck after a hair cut.
• Loud noises
• Light touch
• Temperature
• Crowds

As a result….

- Refusal
- Fear
- Avoidance
- Minimize sensitivities
- Plug ears
- Eloping
- Distraction
- Aggression

Hypo-sensitve

- Under sensitive response
- The bodies lack of response to external stimuli.
- "Sensory Seekers" (CAN BE DANGEROUS)
- Students may appear tired, lethargic, etc.
- May take a lot for these students to feel pain.
- Students may be "risk takers"

As a result....

- These students may require a "Sensory Diet" (under the guidance and supervision of a trained Occupational Therapist)
- These students may need stimulation to arouse.
- These students may appear sluggish, tired, bored, etc.
- These students may be a danger to themselves, or others.
    - Ex. Self injurious behaviors
    - Ex. Throwing body on the floor (seeking pressure input
    - Ex. Do not interpret "pain"

Sensory Systems

- Vestibular (heads movement in space)
- Somatosensory system/Tactile System (Touch)
- Proprioceptive System (body/muscles/joints movement in space)
- Gustatory System (Taste)
- Olfactory System (Smell)
- Auditory System (Sound/Hearing)
- Visual System (Sight/Vision)

We will focus on the sensory systems in RED

Vestibular System

"The inner ear is responsible for this sensory system"

Stimulate

- Swinging fast on a swing.
- Fast movements.
- Bouncing on a trampoline.
- Spinning.

Calm

- Swinging slow on a swing.
- Slow movements.
- Rocking in a rocking chair.

Hyper-Sensitive

- Students may get light headed or dizzy when completing these activities.
- Nausea or throwing up.

Hypo-Sensitve

- Drowsy
- Low energy.

Somatosensory system Tactile-touch

Stimulate

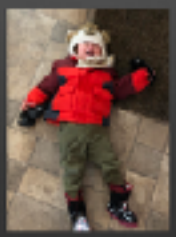
- Light touch
- Cold temperature sensation on the skin.

Calm

- Deep pressure massage.
- Heavy weight
- Warm temperature on the skin.

Hyper-Sensitive

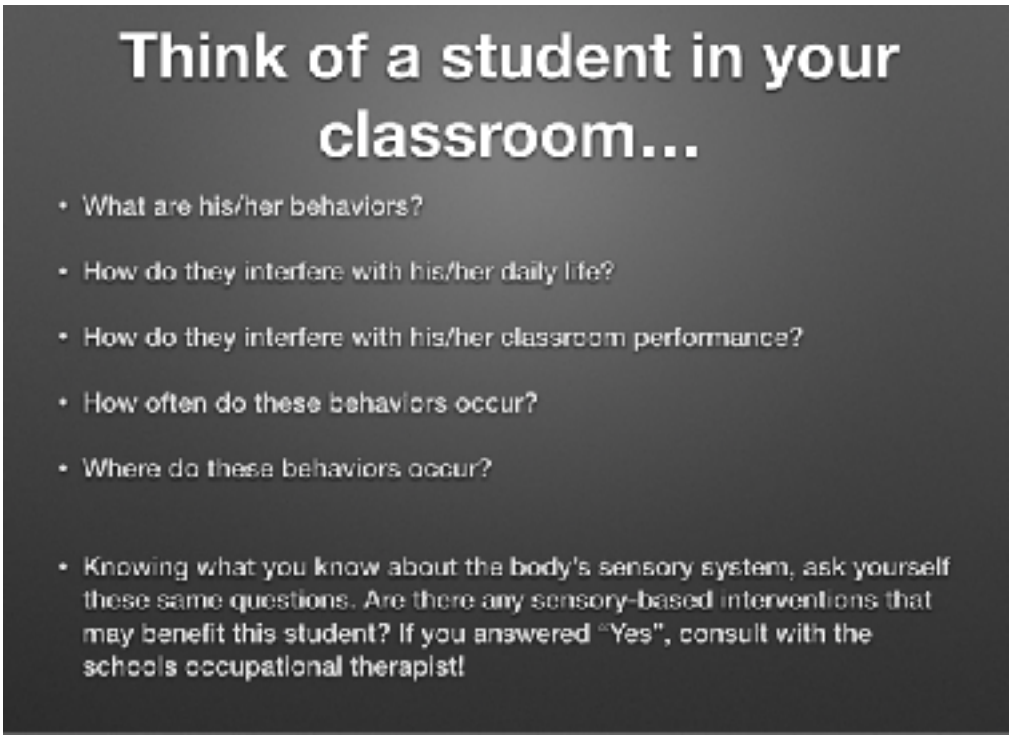
- Touch may be painful
- Temperatures can be "too cold" "too hot"
- Avoid/escape touch
- Clothing can be challenging

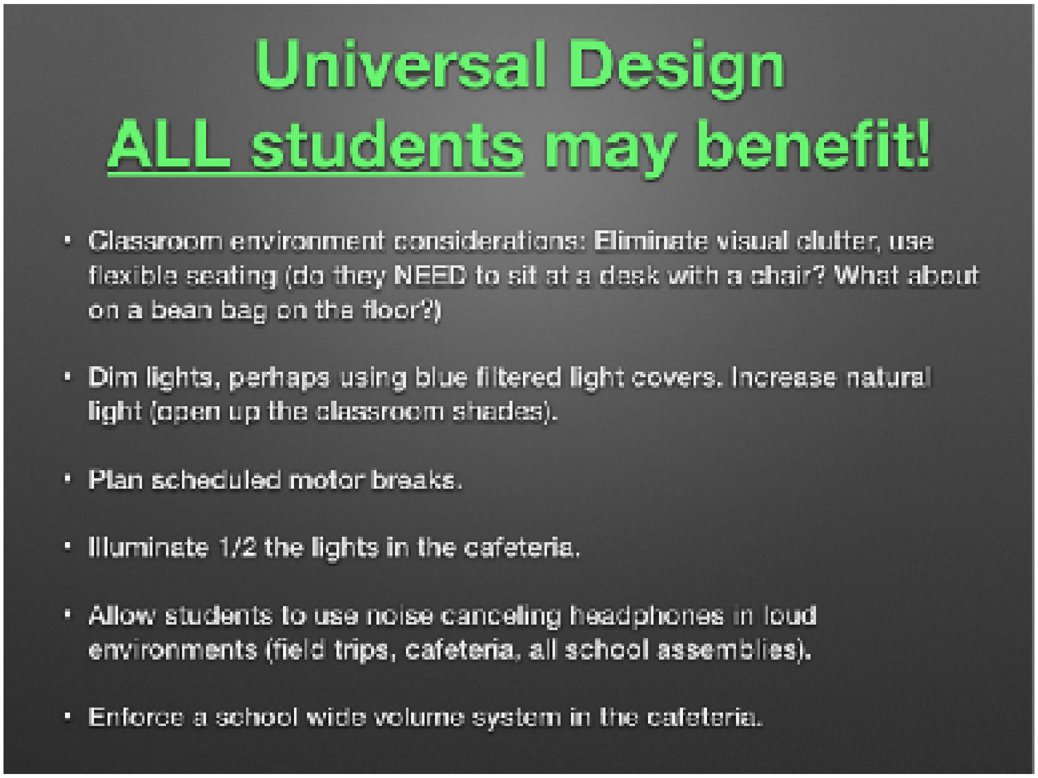


Hypo-Sensitve

- Dangerous- May not register high temp/low temp
- Seek out stimulation
- Physical behaviors.
- Appear restless


Auditory and Visual System
Sound and Vision
Stimulate:
• Bright lights
• High level volume
Calm:
• Blue light filters over florescent lights
• Eliminate visual clutter
• Enforce volume system
• Low level volume
Hyper-Sensitive
• Loud noises or high volume may hurt the ears
• Bright lights may hurt the eyes.
• Multiple people talking at once may be perceived as loud or distracting.
• The faint buzz of environmental noise may be bothersome.
Hypo-Sensitve
• Listen to really loud music.
• May be "noise makers"
• Scream


Think of a student in your classroom…
• What are his/her behaviors?
• How do they interfere with his/her daily life?
• How do they interfere with his/her classroom performance?
• How often do these behaviors occur?
• Where do these behaviors occur?
• Knowing what you know about the body's sensory system, ask yourself these same questions. Are there any sensory-based interventions that may benefit this student? If you answered "Yes", consult with the schools occupational therapist!


Universal Design
ALL students may benefit!
Classroom environment considerations: Eliminate visual clutter, use flexible seating (do they NEED to sit at a desk with a chair? What about on a bean bag on the floor?)
Dim lights, perhaps using blue filtered light covers. Increase natural light (open up the classroom shades).
Plan scheduled motor breaks.
Illuminate 1/2 the lights in the cafeteria.
Allow students to use noise canceling headphones in loud environments (field trips, cafeteria, all school assemblies).
Enforce a school wide volume system in the cafeteria.


RESOURCES

CHAPTER IV: DISCUSSION AND CONCLUSION

Summary

Success is not always measured by a student's academic performance. Special educators know this more than anyone, as the students in their classrooms are graded based on their performance on the goals and objectives, written on their Individualized Education Program (IEP). Students with disabilities have sensory needs that go beyond the skills of a special education teacher, the professional trained in disabilities. Special education teachers work on student performance with the IEP team. Individuals on the team include the parents, social workers, special education teachers, general education teachers, necessary and related service providers such as the occupational therapists, adapted physical education teacher, and speech pathologists.

A student's IEP team is made up of individuals needed to provide students with success in a variety of areas such as academic skills, functional skills, social skills, daily living skills, communication, motor skills, and self regulation. Each student's IEP is developed based on documented needs as determined by the evaluation process. When students with special needs have sensory needs that require intervention, a licensed occupational therapist works with the team to develop a plan to ensure that sensory needs are met. Not only do occupational therapists work on sensory needs, they also address functional skills such as dressing and undressing, feeding, grooming, fine motor skills, and daily living skills. Occupational therapists are members of the special education teams who develop sensory plans to ensure student success in and out of the classroom. What about students without diagnosed disabilities? What if they have sensory

needs but do not receive services because they do not qualify for special education services? How do educators know if a student has a sensory need? The answer is, they often do not.

Understanding the human sensory system is an essential skill in understanding the way external stimuli affects human behavior. In the classroom, student behavioral issues not only impacts the student's ability to learn and succeed in the classroom, it can also affect the other students in the classroom. When student outbursts arise, learning essentially stops. A few questions educators need to ask themselves are; What if the student displaying the negative behavior has limited control over the behavior itself? What if the behavior displayed is the outcome of an external stimuli? Should the student be punished? Educators who understand both the human sensory system and student behavior can answer these questions with research-based evidence combined with their knowledge of the student.

According to Yunus, Liu, Bissett, & Penkala (2015), many stereo-typical behavioral problems result from interference with an individual's sensory system. A student who refuses to participate in tag during gym class may not be a *defiant* child but instead may not be participating because the game involves physical touch and to a student with sensory issues, touch can be interrupted as unpleasant. The student may not even be aware that this is the reason behind his or her unwillingness to participate. Educators who are trained by an occupational therapist to understand the human sensory system, will be able to approach student behavioral challenges from a whole new perspective. Not only will this knowledge and understanding influence the way educators approach these behaviors, but it may also influence the way they teach and how they modify their teaching environment.

Educators may not be able to control the location of their classroom or the number of windows that exist in the room, but they can control the set up of the environment. Educators who have a general understanding of the human sensory system may choose to use flexible seating within their classroom, which allows students to sit comfortably in a variety of positions. For example, the use of a therapy ball instead of a typical chair has proven to increase student performance and positively influence behavior within the classroom (Schilling and Schwartz, 2004). From a sensory standpoint, one may argue that the input students receive through their sensory system while bouncing on the ball contributed to the positive outcome, not just the use of the ball itself. Some children may prefer the rocking motion of a rocking chair and others may chose to sit in a bean bag chair.

Flexible seating is not the only way teachers can arrange the environment to meet the sensory needs of all students. Florescent lights are used in almost every school and in every classroom, but florescent lighting is not optimal for concentration. Florescent lighting may also impact students with hypersensitive visual systems. Since natural lighting is not always accessible in every classroom, some teachers choose to filter florescent lighting by using calming color (blue, green, tan, etc.) filters designed to dim the lighting in effort to boost concentration and student performance (Keis, Helbig, Streb, & Hille, 2014). Lamps with incandescent bulbs are also used instead of florescent lighting to create a calm and relaxing student learning atmosphere.

Research supports the use of variety of sensory techniques while others are used despite research proving their lack of effect. Weighted vests, for instance, are used to provide students with proprioceptive and somatosensory input in hopes of calming and organizing the body. Cox,

Cast, Luscre, and Ayres (2009) found that weighted vests were unsuccessful in getting students with ASD to sit and attend to an academic task. Instead, the authors found that using highly motivating objects was more useful. However, using highly desirable objects during an academic task can be both useful and challenging for the classroom teacher. Useful in the sense that students remain seated for the full duration of the task and challenging because the students will continue to expect desirable objects during non-preferred activities, such as academic group time.

Although many sensory strategies were examined, the author recognizes many interventions were left out. For instance, the use of essential oils has become increasingly popular in schools but was not examined in this report. Also, the author recognizes that many research articles reviewed had small sample sizes and did not represent multiple disability categories. The majority of research available involves students with ASD, ADHD, and those identified sensory disabilities. Future research should use larger sample sizes and begin to examine sensory abnormalities in students with developmental disabilities, physical impairments, other health disabilities, and emotional and behavioral disorders.

Professional Application

As previously mentioned, I am a special education teacher serving students with severe and profound disabilities in a self-contained, center-based classroom. What I did not mention before is that I am also the parent of a child with a developmental disability. I have experience in both my personal and professional life with children who have unique sensory needs. I have found it is essential to work hand-in-hand with a licensed occupational therapist in order to successfully address these sensory needs.

Working in special education, I have found that the majority of my professional colleagues are unfamiliar with how the sensory system works. They do not realize the outcomes that can be displayed by students who are both hyper and hypo-sensitive to internal and external stimuli. Working for a school district with limited funds also poses a challenge because our school employs only one occupational therapist who has a very large case load making it difficult for her to inform all teachers on this topic. Because of this, I have developed a slideshow with the intent to inform and encourage general education teachers to consider the sensory needs of all students. Recognizing the sensory needs of students and proactively addressing the needs will decrease problematic behaviors before they arise. Educators should be aware that all techniques mentioned in this paper, while routinely implanted in schools, fall under the scope of occupational therapy practice. To implement techniques without guidance could produce an increase in negative behavior or cause additional sensory dysregulation. Routinely implementing and prescribing practices without training maybe considered practicing without a license. When in doubt and before implementing strategies learned, it is important for educators to consult with a licensed occupational therapist. Special education teachers collaborate with the student's IEP team to design effective programming and instruction. It is my hope that by sharing this information with general educators, all students' sensory needs will be addressed.

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