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And Instruction

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Abstract

Children with sensory processing disorder (SPD) show academic underachievement, inattention, and disruptive behaviors in general education settings. This project explores the need for environmental modifications and instructional supports in general education inclusive classrooms. The literature shows that individuals with autism spectrum disorder (ASD) and/or attention deficit hyperactivity disorder (ADHD) often experience SPD as a comorbid condition, which negatively impacts their ability to learn and function at school. Additionally, classroom design and instruction lead to overstimulation in students with SPD. Research has established that sensory based interventions have positive effects on a child's level of focus and attention. A guidebook has been created and included that provides strategies and supports for educators to use in designing a sensory friendly classroom. This resource allows teachers to implement environmental modifications and instructional strategies throughout their daily routines to meet the needs of students with SPD and ultimately, increase academic and social growth.

Keywords: Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, Sensory Processing Disorder, Inclusive Classroom

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Chapter One

Introduction

It is difficult for neurotypical humans to imagine being unable to count to ten because background noises ring far too loud, lights shine much too bright, the scent in the air sparks instant nausea, and clothing feels uncomfortably rough. Humans access their environments and navigate their surroundings through their five senses- hearing, sight, touch, taste, and smell (Sweet, 2010). When the brain has trouble receiving and responding to this information, sensory experiences can be heightened in some areas and muted in others, causing confusion, panic, and stress within. Children who face this challenge, known as sensory processing disorder (SPD), have difficulty achieving academic and social success while in over and/or under stimulating classroom environments (Macdonald, Trembath, Asburner, Costley, & Keen, 2018). Elementary grade classrooms, especially primary grades, are decorated wall to wall with an abundance of brightly colored papers, pictures, and words (Milo-Shussman, 2017). Inside of these classrooms, lights shine, music plays, teachers talk, students move, and children learn. Classrooms should be designed in ways that allow for students to succeed, regardless of ability. This chapter will discuss the purpose and significance of the handbook, *Sensory Friendly Classroom Design and Instruction*.

Purpose of the Project

Children with disabilities are currently enrolled in inclusive general education classrooms with their typically developing peers. The rise of inclusive classrooms means general education teachers are expected to expand and advance their teaching practice in order to meet the academic, social, and emotional needs of their diverse population of learners. Students with SPD, which often occurs as a comorbid condition in individuals with developmental disabilities, such

as autism spectrum disorder (ASD), face specific limitations and challenges in a general education learning environment.

The classroom design, decor, environment, and instructional practices impact the sensory experiences of all students, especially those who process sensory stimuli differently. Students with SPD show academic underachievement and inattentiveness in general education classroom environments. The question then arises: how can general education teachers of inclusive classrooms incorporate sensory integration into classroom design and instruction in order to support the needs of students with SPD? The purpose of this project is to provide general educators a guide in designing a sensory friendly classroom and implementing instructional strategies that are sensitive to and are designed to meet the needs of students with SPD.

Significance of Project

Students with SPD, including ASD, have shown patterns of academic underachievement and inattentiveness in general education classrooms (Ashburner, Ziviani, & Rodger, 2008). This project provides the knowledge and tools that educators need to significantly improve the amount of support for students with SPD in their classrooms, both academically and socially. Teachers who implement the supports and interventions found in this project guidebook may improve the success of students with sensory processing difficulties in the general education classroom setting. This guidebook provides a resource for general educators in order to make intentional decisions about classroom décor, environment, and instructional strategies in order to benefit all learners. Being present in a learning environment that meets the needs of students with sensory processing difficulties will decrease the prevalence of disruptive behaviors that manifest in sensory over- and under- responsive situations, providing a calm learning environment for all classroom members (Chan & Chien, p. 30, 2007).

Summary of Chapter

The ability to process sensory input appropriately impacts the way an individual engages in various environments and activities. In general education classrooms, students are often members of colorful, busy, loud environments where they are expected to maintain focus, participate meaningfully, and achieve success. Children with SPD face challenges in processing input through the eight sensory systems, which negatively impacts their academic, social, and behavioral achievements. This project serves as a resource for general education teachers to use in creating a sensory friendly classroom that allows for all students, regardless of ability, to successfully access meaningful educational opportunities. Teachers can use the handbook, *Sensory Friendly Classroom Design and Instruction*, to design their classroom environments and lessons with intention.

Definition of Terms

Autism Spectrum Disorder: A developmental disorder affecting communication and behavior (National Institute of Mental Health, 2018)

Attention Deficit Hyperactivity Disorder: A disorder causing heightened levels of inattention, hyperactivity, and impulsivity (National Institute of Mental Health, 2016)

Inclusive Classroom: All students, regardless of ability, are placed in age-appropriate general education classes to receive high quality instruction, interventions, and supports that enable them to successfully access the curriculum (Alquraini & Gut, 2012)

Sensory Integration: "... the stimulation of the neuronal response mechanisms of an individual to sensory stimuli," (Smith, 2010).

Sensory Over Responsivity/Hyperresponsivity: "... an exaggerated, intense, or prolonged behavioral response to ordinary sensory stimuli," (Conelea, Carter, & Freeman, 2014).

Sensory Processing Disorder: When an individual's brain does not properly process and organize sensory input from one's body and environment; affects the way an individual uses their body in an environment (Cheung & Sui, 2009).

Sensory Seeking Behavior: A way for an individual to achieve the atypical amount or type of sensory input that they are yearning for (Engel-Yeger & Ziv-on, 2011).

Sensory Under Responsivity/ Hyporesponsivity: An individual's inability to detect sensory input (Engel-Yeger & Ziv-on, p.1155. 2011).

Chapter Two

Literature Review

This project was intended to serve as a guide for educators to utilize as they support their students with various sensory needs in inclusive classroom settings. Students with SPD, including ASD, frequently show patterns of inattentiveness and academic underachievement in general education classrooms (Ashburner, Ziviani, & Rodger, 2008). Educators can use *Sensory Friendly Classroom Design and Instruction* as a resource in designing a sensory friendly classroom and using intentional instructional strategies that allow for sensory breaks and appropriate levels of sensory input. This literature review discusses: (a) the comorbidity of sensory processing disorder, (b) the effects of SPD on students' academic achievement, (c) the impact of sensory stimulation within classrooms on students with and without disabilities, and (d) the positive effects of sensory based interventions.

Sensory Processing Disorder: A Comorbid Condition to Developmental Disorders

A sensory processing disorder occurs when an individual's brain does not properly process and organize sensory input from one's body and environment. These brain functions direct the individual's use of their body in the environment (Cheung & Sui, 2009). When living with SPD, there is an impairment in the individual's ability to take the information received through the senses and dictate an appropriate response. This is caused by certain areas of the brain being unable to receive the information needed. Sensory information is received through eight systems: visual, auditory, olfactory, gustatory, tactile, vestibular, proprioceptive, and interoceptive (Understanding Sensory Processing Disorder, n.d.). The first five systems are also known as sight, hearing, smell, taste, and touch. The vestibular system controls an individual's

ability to maintain balance and spatial awareness. The proprioceptive system manages the body's muscle and joint movements, both the positioning of the body parts and the energy it takes to move them. Interoception operates the body's internal regulation system and communicates the state of an individual's internal organs to the brain. This is how a person knows if they are hungry, thirsty, in pain, etc. (Your 8 Senses, n.d.).

Individuals with SPD respond to sensory stimuli in various ways: over responsivity, under responsivity, and/or sensory seeking behaviors. Over responsivity, also referred to as hyperresponsivity, is an intense reaction to sensory stimuli that happens quicker than a typical response or endures for a longer time. Negative, aggressive, or avoidance behaviors may occur due to the unpleasant and irritating feelings the individual experiences in response to non-harmful stimuli. Under responsivity, or hyporesponsivity, to sensory stimuli refers to an individual's inability to detect sensory input. The individual's dismissal of sensory information often creates feelings of "apathy, lethargy, and a seeming lack of inner drive to initiate exploration," (Engel-Yeger & Ziv-on, p.1155. 2011). Sensory seeking behaviors serve as a way for an individual to achieve the atypical amount or type of sensory input that they are yearning for (Engel-Yeger & Ziv-on, 2011).

SPD commonly occurs as a comorbid condition in individuals with developmental disorders, such as autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) (Cheung & Siu, 2009). Developmental disorders impose delays and limitations on a child's ability to meet the societal standards set for cognitive, communicative, social, and/or motor development milestones. Individuals with developmental disorders face an extra layer of barriers in achieving independence and acceptance (Odom, Hordner, Snell, & Blacher, 2007).

As defined by the National Institute of Child Health and Human Development, “ASD is a complex developmental disorder that affects how a person behaves, interacts with others, communicates, and learns,” (About Autism, 2017). Autism may have adverse effects on the functions of the brain and nervous system. The nervous system controls the brain’s response to sensory input, which is referred to as cognition. Cognition is “a concept that includes learning and memory, perception, sleep, decision-making, emotions, and all forms of higher information processing,” (Gage, p. 6, 2015). Therefore, a child’s cognitive ability to process sensory information and respond appropriately is directly impacted by ASD.

A significant difference in sensory processing abilities has been noted in children with ASD when compared with their typically developing peers. Children with ASD typically experience extreme under-responsivity to sensory input, with the exception of the auditory system. In a study conducted to explore the sensory processing patterns in children with ASD, 92% of the sample group showed over-responsive behaviors to auditory input (Lane, Young, Baker, & Angley, 2010). Multisensory integration is another challenging task these children face. Multisensory integration involves processing sensory information through multiple sensory systems (Howe & Stagg, 2016). Children with ASD face challenges in behavior, communication, and learning; the inability to appropriately process sensory information only adds to that challenge.

ADHD, another of the most common developmental disorders, also impacts a child’s ability to function in a way that meets societal standards. Children living with this disorder exhibit often disruptive behaviors such as inattentiveness, impulsivity, distractibility, increased activity, and experiencing sensory processing challenges (Engel-Yeger & Ziv-on, 2011). In the United States, 5.4 million children between the ages of 2-17 years old, 8.4% of U.S. children, are

currently diagnosed with ADHD (Bitsko, Danielson, Ghandour, Holbrook, Kogan & Blumberg, 2018). Children with ADHD have shown patterns of presenting over responsivity to sensory stimuli with added emotional responses (Reynolds, Lane, Gennings, 2010). The co-occurrence of SPD and ADHD in children limits their ability to successfully participate in daily activities.

The co-occurrence of SPD and developmental disabilities, specifically ASD and ADHD, hinder a person's ability to succeed in a world that depends on typical processing abilities. As noted above, children engage in various types of adaptive behaviors in order to respond to their brain's response to sensory input. These behaviors are often negative, distracting, and deemed inappropriate. Living with sensory processing difficulties impacts a child's ability to participate in the academic, behavioral, and social challenges of a classroom.

Negative Effects of SPD on Academic Performance

The Individuals with Disabilities Education Act of 1975 (IDEA) established the law that requires school districts to provide access to a free and appropriate public education to all students eligible for special education and related services (IDEA, 1975). In 2004, congress reauthorized IDEA, creating the Individuals with Disabilities Education Improvement Act (IDEIA) (IDEIA, 2004).

One of the most critical revisions to the law, was the addition of the requirement to educate students with disabilities in the least restrictive environment, which is the general education classroom, when appropriate. IDEIA (2004) required schools to implement inclusive education practices in which students with disabilities were provided as much time as possible with their typically developing peers.

Inclusive classrooms create student populations with increasingly diverse learning needs due to the addition of students with disabilities to the roster. There are 13 disabilities that students may qualify for special education services by meeting various eligibility criteria (IDEIA, 2004). According to the National Center for Education Statistics (2018), 9% of students receiving special education services qualify under ASD and 34% of students qualify under specific learning disability (SLD), which encompasses students with ADHD. While SPD is not a stand-alone qualifying condition, students receiving special education services often experience SPD as a comorbid condition, as described previously.

General education classrooms are stimulating environments where learning and growth take place each day. They are often decorated from wall to wall with colorful displays, various student work samples, educational posters, and more. Teachers enthusiastically design and decorate their classrooms for the purpose of creating a positive, personalized, welcoming environment that keeps students stimulated and engaged (Hanley, Khairat, Taylor, Wilson, Cole-Fletcher, & Rigby, 2017). Throughout a typical school day, teachers talk, students move, music plays, lights turn on and off, and the pace of instruction is quick. While typically developing students may thrive in this type of environment, students with sensory processing disorders, in addition to the disability they live with, do not.

Students with disabilities such as ASD and ADHD have needs that vary from those of typically developing students, many of these needs are related to the way their brains process sensory information. When expected to learn in these vibrant general education classrooms, they may not succeed. Ashburner, Ziviani, and Rodger (2017) conducted a study that explored the correlation between sensory processing and the classroom emotional, behavioral, and educational consequences in children with ASD. The researchers found that sensory hyperresponsivity,

sensory seeking behaviors, and auditory filtering difficulties had negative implications on students' academic performance and attention. The co-occurrence of SPD in ASD creates an especially challenging feat in processing information through the auditory system, which affects a student's ability to attend to and understand verbal directions accompanied by background noise. Levels of student attention were significantly impacted by hyperresponsivity to sensory input through the tactile system (Ashburner, Ziviani, & Rodger, 2017). The presence of an auditory filtering impairment, hyperresponsivity, and/or sensory seeking behaviors in students with ASD result in inattentiveness and ultimately, academic underachievement.

Children living with ADHD also face challenges to achieving success in overly stimulating general education classrooms. These students struggle with processing visual stimuli and maintaining focus on one object. Kofler, Rapport, and Alderson (2008) conducted a study to quantify classroom inattentiveness in students with ADHD. They found a significant deficiency in students' visual attention and focus when compared to their typically developing peers. The researchers reported that students with ADHD maintained visual attention in the classroom setting an average of 75% of the time, while their typically developing peers maintained focus 88% of the time (Kofler, Rapport, & Alderson, 2008). This suggests that children who have a disability that impacts their ability to process and maintain focus in a classroom setting will be less able than their typically developing peers to perform academically, when their learning environment is too visually stimulating.

Individuals with SPD have been able to share their experiences and the effects of the disorder on their ability to learn in the classroom through various studies. Individuals who live with this disorder provided researchers with valuable information about the internal feelings during times of sensory processing difficulties. It is important to note the participants in these

studies experience SPD as a comorbid condition with ASD (Howe & Stagg, 2016; Kirby, Dickie, & Baranek, 2015).

Howe and Stagg (2016) collected data through questionnaires aimed at learning more information about atypical sensory experiences in adolescents and the level at which it affects the participants in the classroom. The questionnaire data showed that “88% of the participants were affected by issues relating to hearing, 75% by touch, 50% by vision and 38% by smell. All of the participants reported difficulties with at least one sense,” (Howe & Stagg, p. 1660, 2016).

Participants in the study identified the auditory system as the one that affected their performance in the classroom the most, followed by tactile, smell, then vision. The researchers reported participants indicated a negative impact on concentration when asked how their sensory experiences affected their learning. Participants responded that their sensory experiences in the four focus systems created feelings of discomfort and anxiety within them (Howe & Stagg, 2016). Using the information gathered during Howe and Stagg’s study, it can be inferred that children with SPD experience internal discomforts and limitations, which have negative implications for their academic performance.

Kirby, Dickie, and Baranek (2015) conducted a similar study that focused on learning the internal perspective of sensory experiences in children with SPD and ASD between the ages of 4-13 years of age. Through in-home child interviews, researchers learned that young children on the autism spectrum are able to communicate their sensory experiences. The participants indicated that they had impulsive physical responses, felt afraid, and used self-made strategies in response to their nervous systems’ inability to appropriately respond to sensory information. Loud noises, tactile input, past experience, and being in proximity to certain objects built up feelings of pain, fear, and anxiety in the children (Kirby, Dickie, & Baranek, 2015). When

children are suffering from negative experiences internally, they will be less able to attend to cognitive tasks or perform academically. SPD directly impacts a child's participation in activities and settings throughout their school days.

Impact of Classroom Design and Instruction

Classroom design and decor, layout, and instructional supports are important factors that affect the educational success of students. Teachers should be making intentional decisions in these areas to promote positive learning environments in which all students can thrive. Visual displays, seating arrangements, and instructional supports are all components of a classroom that impact student ability to make academic, behavioral, and social growth in the classroom, especially those with SPD.

Visual displays in the classroom should not be distracting or overwhelming, rather they should foster an environment of relaxation and concentration (Milo-Shussman, 2017). Classroom walls that are overloaded with visuals, colors, words, and letters may not leave enough room for student work samples to be hung with pride. The competition between meaningless decoration and student work may hinder student imagination and creativity (Milo-Shussman, 2017). If students feel their work is not being appreciated or celebrated, their motivation and self-esteem may begin to dwindle, alongside their creative processes and imaginative ideas (Hanley, Khairat, Taylor, Wilson, Cole-Fletcher, & Riby, 2017). When classroom decorations incorporate too much color, the displays may feel loud or cause "visual noise" in all students, not just those with disabilities. Visual noise makes it difficult for students to process information through other senses because the visual stimuli is requiring such a high level of focus and energy from the brain (Milo-Shussman, 2017). If a student's brain is fully focused on navigating visual stimuli,

auditory filtering will not be successful and students may not hear verbal instructions or auditory input. The academic performance of all students is affected by the visual displays and decorations in a classroom.

Educational posters and learning aids can be beneficial visual supports to students without impacting student attention and learning opportunities. The level of complexity of a classroom, which is how decor and physical layout intertwine to create an energy and environment, correlates with academic progress of the students. As children grow older, their ability to maintain attention to a task increases in duration with decreased distractibility (Gaspelin, Margett-Jordan, & Ruthruff, 2015). The visual stimuli of primary grades in elementary school, K-2, are crucial due to the children's young age and lack of ability to maintain attention. Hanley et. al (2017) conducted a study that used eye-tracking technology to measure the impact of classroom displays on the attention and learning in children with and without ASD. The researchers compared the students' eye movements from a visually distracting environment to those of an environment with empty walls. They found "a clear effect of the presence of visual displays on attention for all children," (Hanley et. al, p. 1272, 2017). Therefore, students with and without disabilities are negatively impacted by too much visual stimuli present in their learning environment.

Visual displays are not the only factor that has implications on students' attention and learning. A study was conducted to examine the effects of various seating arrangements on the prevalence of off-task behaviors among students. The findings of the study showed the organization of students' seats influences student behaviors. Row seating resulted in the least amount of off-task behaviors with more individualized instances. Cluster seating resulted in the

most off-task behaviors among students, with inappropriate talking being the most prevalent (Simmons, Carpenter, Crenshaw, & Hinton, 2015).

The number of steps in verbal directions, length and types of activities assigned, and transitions between tasks are small components of a school day that play a major role in the chances of a student with a disability being successful (Macdonald, Trembath, Ashburner, Costley, & Keen, 2018). The amount of input and processing required by a student in order to complete the aforementioned tasks can be overwhelming for a child with ASD or SPD. Lack of planning and implementation of supports in these areas may result in increased anxiety, maladaptive behaviors, and educational underachievement in these students (Macdonald, Trembath, Ashburner, Costley, & Keen, 2018).

Students with auditory processing difficulties, which is common in ASD, benefit from visual schedules and cues. They engage in on-task behavior for longer durations of time, complete work with more accuracy, and reduce their engagement in maladaptive behaviors (Mesibov & Shea, 2009). Visual schedules are an instructional support that provides predictability to students using pictures, symbols, and/or words. When students know what to expect in their school day, what will be expected of them, and when transitions are going to occur, anxiety levels fall in students on the autism spectrum (Macdonald, Trembath, Ashburner, Costley, & Keen, 2018).

The use of visual schedules in a general education classroom can alter the amount of time teachers spend giving verbal directions. With pictures, symbols, and/or words posted in an accessible area, less instruction is needed, thus allowing students on the spectrum to tap into their greater ability to process visual information (Baron-Cohen, Ashwin, Ashwin, Tavassoli, & Chakrabarti, 2009). Instructional supports are beneficial to students with ASD, SPD, other

disabilities, and those who are typically developing (Macdonald, Trembath, Ashburner, Costley, & Keen, 2018).

Effectiveness of Sensory Based Interventions

Sensory based interventions are based on A. Jean Ayres' theory of sensory integration. The occupational therapist found that "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," (Ayres, p. 11, 1978). Interventions are implemented to teach the child adaptive or compensatory strategies to successfully participate in daily activities, such as play, school, and happenings at home. Sensory based interventions include environmental modifications, adaptations to daily routines, and changes in how people interact with the child (DiMatties & Sammons, 2003).

Sensory based interventions have proven to positively impact the sensory processing abilities of individuals with varying forms of SPD. Evidence has shown that access and participation in sensory environments as a supplement to daily routines "enhanced the sensory awareness of individuals with neurological disabilities and assisted," (Thompson, p. 203, 2011). Maladaptive behaviors decreased, participation increased, and environmental barriers were broken down after the individual was given the opportunity to regulate his/her sensory systems (Thompson, p. 203, 2011). It has been suggested that "'reliability, predictability, relaxation, and freedom from demands rather than sensory input' may be key contributors to multisensory therapy," (Chan & Chien, p. 30, 2007; Thompson, p. 203, 2011). Thompson (2011) presented a 2005 study conducted by Smith, Press, Koenig, and Kinnealey for the purpose of learning the possible effects of multisensory integration on young children with developmental disabilities.

The study found a significantly reduced presence of self-injurious behaviors among the participants, which suggested that sensory based interventions are “effective in reducing self-stimulating behaviors that interfere with functional behaviors,” (Thompson, p. 204, 2011).

Multisensory environments have proven to increase sustained focus levels, vastly reduce maladaptive behaviors, and increase levels of relaxation, happiness, and engagement in students with disabilities (Thompson, 2011).

Sensory integration interventions have proven effective in supporting students with developmental disabilities, such as ASD and ADHD. A 2011 study designed to evaluate the effectiveness of sensory based interventions in students with ASD found significant improvements in various areas. Stereotypical behaviors, the ability to regulate sensory processing, social-emotional functions, and fine motor skills were all improved after intervention. Students also demonstrated increased work completion (Pfeiffer, Koenig, Kinnealey, Sheppard, & Henderson, 2011). When students are able to regulate their sensory processes, internal feelings, emotions, and fine motor skills, they are better able to perform in the classroom and make academic progress. Social growth and participation will also be more likely for individuals with ASD and SPD due to the decrease of stereotypical behaviors that are often deemed socially inappropriate and the increased ability to self-regulate (Pfeiffer et. al, 2011).

Summary of Chapter

Sensory processing disorder (SPD) impacts an individual’s ability to process information through the eight sensory systems; this informational input comes from one’s body or environment. Sensory processing refers to the brain’s ability to receive, manipulate, and send out appropriate physical and emotional responses through the sensory systems. Research has found

common responses to these impaired brain functions to be maladaptive behaviors, physical discomfort, and increased anxiety. SPD commonly occurs as a comorbid condition in people with developmental disabilities, particularly autism spectrum disorder (ASD) and attention-deficit hyperactivity disorder (ADHD). SPD negatively affects the academic, behavioral, and social performance of students with disabilities in school, especially in inclusive general education classrooms. The classroom design and instructional supports commonly used by general education teachers can negatively affect students' abilities to attend to cognitive tasks and achieve academic growth. Research has found sensory based interventions to have positive impacts on maladaptive behaviors and the ability to self-regulate in individuals with SPD. Chapter three discusses the methodology and procedure in creating the *Sensory Friendly Classroom Design and Instruction* guidebook.

Chapter Three

Methodology

Students with sensory processing disorders (SPD) face limitations and challenges in meeting academic and social expectations in school due to the potentially overwhelming sensory stimulation presented by the classroom design and instructional strategies implemented by many educators (Ashburner, Ziviani, & Rodger, 2017). A pattern of academic underachievement and inattention in students with SPD in general education inclusive classrooms has been reported in recent studies (Ashburner, Ziviani, & Rodger, 2008). This project included a guide to support educators in establishing a sensory sensitive learning environment, *Sensory Friendly Classroom Design and Instruction*. This handbook provides educators with insight into the effects sensory processing difficulties have on children, as well as tips for designing and teaching in an inclusive classroom.

The growing prevalence of inclusive classrooms, (IDEIA, 2004), requires educators to have the practical knowledge, resources, and training to meet the needs of the diverse learner population in their classrooms. The development of this handbook was guided by the following questions: (1) How can general education teachers in inclusive classrooms adapt their classroom design and instruction to support the needs of students with SPD? (2) How can students with sensory processing difficulties benefit, academically and behaviorally, from learning in a sensory friendly classroom? This chapter describes the methodology used for developing this project in its project design and identification of target audience, setting, and procedures.

Design

Sensory Friendly Classroom Design and Instruction is a handbook for general education teachers to use as a resource as they create sensory friendly learning environments for their students. The author employed qualitative research methods such as interviews and observations in inclusive general education classrooms, together with an extensive review of outstanding literature, to identify what the author perceived as a pervasive problem of academic underachievement and inattentiveness in children with SPD. The author concluded that the only viable way to effectively address ways in which general educators can meet the needs of their learners with sensory needs was to first acquire the perspectives and direct experiences of these educators.

The *Sensory Friendly Classroom Design and Instruction* Guide covers everything from the rationale for designing a sensory friendly classroom to the resources needed to do so. The handbook opens with an introductory definition and explanation of SPD and the reason sensory friendly classrooms are needed. The next chapter, “Classroom Design,” is broken down into subsections: Color Scheme, Décor, Physical Arrangement and Organization, Seating Types and Arrangements, Environment, and Daily Routines. This section of the handbook provides ideas, visuals, and information to support teachers in modifying the classroom environment to better support students with sensory sensitivities. The next chapter, “Instructional Strategies,” is part of the guide and delivers methods in which teachers can provide students opportunities to learn through various sensory systems; plus, some instruction for teachers about potential sensory overload in students. The subsections of this chapter are: Multiple Modalities, Visual, Tactile,

Auditory, Brain Breaks, and Sensory Tools. Finally, the handbook includes a list of resources, which provides sensory input tools for both teachers and students to utilize in the classroom.

Audience and Setting

This project was designed for general educators in inclusive classrooms, specifically in kindergarten through second grade. The use of sensory based interventions in classroom design and instruction is beneficial for all students, regardless of ability, race, gender, socioeconomic status, or any other areas of potential bias (Hanley et. al, 2017). *Sensory Friendly Classroom Design and Instruction* was designed with the elementary students of a North County San Diego District in Southern California as the focus population. According to the U.S. Census Bureau in 2018, the population of this city was 96,847 people with roughly 26.2% of the population under the age of 18. In terms of ethnic demographics, 45% of the population was White, 38.6% was Hispanic or Latino, 9.7% was Asian, and 2.8% was Black or African American (United States Census Bureau, 2010).

Sensory Friendly Classroom Design and Instruction was created as a resource for general education teachers to use in order to create optimal classroom environments for all students in their classrooms. This guide or handbook was created to support teachers of elementary aged students, specifically in kindergarten through second grade. Further, the handbook was developed with a specific target population of students with SPD and/or autism spectrum disorder (ASD) in mind.

The author, while designing this resource for educators, attempted to consider the financial limitations many teachers face on a daily basis when trying to procure materials to help

meet their students' needs. The resources and strategies included in the handbook were specifically designed and intended to be affordable and easily created on a limited teacher's budget. Another key consideration in designing the handbook was the need to maintain engagement with typical students throughout the school day, while avoiding potential adverse effects on learners with SPD in the same environment. Finding a balance between the needs of the target population and the typical students proved to be somewhat challenging, yet this handbook represents an initial attempt to find this balance. The author encourages readers to use the handbook and modify its suggestions in order to develop their own approaches and to refine the handbook, establishing additional effective techniques.

Procedures

The creation of *Sensory Friendly Classroom Design and Instruction* required multiple steps and processes in order to create a purposeful product that addressed the needs presented in the research. The first step in creating a project that addressed the academic underachievement and inattentive patterns of children with SPD was to attain a thorough understanding of the effects of this type of disorder in a child's brain, the physical manifestations of abnormal sensory responses, and the effectiveness of established sensory integration strategies. The author acquired information through extensive reviews of literature, which unequivocally established the need for professional development for general education teachers on this topic. Some examples of abnormal sensory responses include loud humming, hitting oneself or others, and eloping from the environment. This was an important step in the process, because so many teachers misunderstand or misinterpret these types of behaviors.

The next step was to conduct face-to-face observations and informal interviews with general education teachers in inclusive settings that educate students with various sensory needs. The author was able to obtain information from these primary sources through teachers and observations in multiple elementary schools in North San Diego County, California. The author interviewed a cross section of teachers from grades one to six and gathered data from 12 teachers in three different school environments. These perspectives and the experiences gleaned from current educators contributed to the development and design of the handbook, focusing on the practical needs of general education teachers, while also directly addressing specific needs of children with SPD, as identified by outstanding research.

The practical information gathered was analyzed in the context of the current research. The result was organized by the author, and provided the foundational basis for the handbook. These findings guided the author to create a specific, yet user-friendly handbook for educators to use to implement sensory sensitive practices in their classrooms. The author included affordable resources and practical models in compiling and drafting the handbook. Following the development of *Sensory Friendly Classroom Design and Instruction*, the author developed a professional development training to support teachers' understanding, professional growth and implementation of the material.

Summary of Chapter

Through extensive research, interviews, and observations, an effective handbook was created for general educators to use as a resource as they balance the sensory stimulation of their students in an inclusive classroom. *Sensory Friendly Classroom Design and Instruction* was designed to support teachers as they strive to support the diverse needs of their students.

Thorough precise explanations, easy to follow guidelines, and a full list of resources allowed educators to address the needs of all students in their classrooms with the goal of improved student academic achievement, attentiveness, and behavior in the classroom for their learners with sensory needs. The guidebook is found in Appendix A. The subsequent chapter discusses limitations of the project, next steps, and the author's reflection on the creative process.

Chapter Four

Results

The *Sensory Friendly Classroom Design and Instruction* manual was created to serve as a resource for elementary general education teachers in inclusive classroom settings. The guidebook, found in Appendix A, includes evidence based strategies for educators to use in creating a learning environment that is purposefully designed to meet the needs of students with sensory processing disorder (SPD), thus improving their academic and social success.

The guidebook opens with an introductory section that includes three subsections: Rationale, What is SPD?, and Be Intentional. This introduction serves to introduce SPD to teachers, describe the impact SPD has on student academic and social success, and inspire the reader to make intentional decisions in the creation of their learning environment. The main content of the guidebook is separated into two sections: Classroom Design strategies and Instructional Strategies. The Classroom Design chapter contains the following subsections: (1) Color Scheme, (2) Décor, (3) Physical Arrangement and Organization, (4) Seating Types and Arrangements, and (5) Environment. This provides the reader with research-based strategies to be used in creating a sensory sensitive classroom through environmental modifications. The next chapter, Instructional Strategies, includes the following subsections: (1) General Supports, (2) Sensory Seeking SPD, (3) Under Responsive SPD, (4) Over Responsive SPD, and (5) Sensory Breaks. Specific instructional supports and strategies that benefit students with any of the three types of SPD are found in this section. Additionally, this section addresses the importance of sensory breaks throughout the school day.

Following these two main chapters of the guidebook is a section containing organized lists and images of sensory supports and accommodations as examples for teachers to

incorporate into their classroom design. The guidebook is closed by the Considerations and Conclusion section. This section includes recommendations from the author for implementation into classrooms and how to ensure appropriate student use of the tools and supports.

A professional development guide, found in Appendix B, dissects the information in *Sensory Friendly Classroom Design and Instruction* into a user-friendly staff training. A PowerPoint presentation presents the information in a concise, effective manner. The guidebook and training were created to best inform, prepare, and guide teachers in creating sensory friendly learning classrooms.

In chapter 5, the researcher reflects upon the process of creating *Sensory Friendly Classroom Design and Instruction*, as well as addresses recommendations and limitations to the project.

Chapter Five

Discussion & Recommendations

Children with sensory processing disorder (SPD) show academic underachievement, inattention, and disruptive behaviors in general education settings. This project explores the need for environmental modifications and instructional supports in general education inclusive classrooms. The literature review establishes that individuals with autism spectrum disorder (ASD) and/or attention deficit hyperactivity disorder (ADHD) often experience SPD as a comorbid condition, which negatively impacts their ability to learn and function successfully at school. Additionally, typical classroom design and instruction leads to overstimulation in students with SPD. Research has suggested that sensory based interventions to have positive effects on a child's level of focus and attention. A guidebook has been created and described in detail in this project paper that includes strategies and supports for educators to use in designing a sensory friendly classroom. This resource allows teachers to implement environmental modifications and instructional strategies throughout their daily routines to meet the needs of students with SPD and ultimately, to increase academic and social growth. This chapter addresses the limitations of the project, the suggested next steps, lessons learned and educational implications, and concludes with a summary.

Limitations of the Project

Limited research has been conducted focusing on the incorporation of sensory supports in general education classrooms. The majority of literature related to this topic discusses the benefits of students with SPD accessing a multisensory environment outside of their classroom. Studies have shown that students living with SPD and other disabilities are able to maintain an

increased level of focus when returning to their classroom after spending time in a multisensory environment (Thompson, 2011). Due to the positive impacts of multisensory environments on the attention levels of children with SPD, *Sensory Friendly Classroom Design and Instruction* was designed to minimize the time these students spend removed from their classroom, learning environment, and peers with whom they need to interact.

In creating this project, the author faced limitations in finding formalized research to support value of the specific sensory input tools she suggested educators could include in their classroom and lessons. Nevertheless, the strategies and tools found in the guidebook offer a plethora of positive reviews and testimonials from teachers across the country. Though lacking the scientific research, the recommendations and suggested strategies the author included throughout the guidebook are effective and easy to implement.

If endless resources and support were available, the author could have made explicit comparisons in each section of the guidebook between sensory friendly classroom and over or under stimulating classroom environments. Because of time constraints, this opportunity did not present itself. That said, she believes that teachers could benefit from the side by side comparison, if only as a dramatic example of the difference a sensory friendly environment makes in a classroom environment.

Next Steps

Sensory Friendly Classroom Design and Instruction is a resource for general education teachers of primary grades to implement in their inclusive classrooms. Most of these strategies can be adapted to classrooms of different ages and ability levels with ease. The supplemental professional development training provides opportunities for educators to collaborate and discuss implementation of the strategies presented in the guidebook. The author created this secondary

resource in hopes that general education teachers will use it to support both academic and social growth in their students with disabilities. By modifying classroom environments and providing various engagement strategies and supports throughout instruction, she is confident that children with sensory processing difficulties will be able to spend more time in their classroom.

The author hopes teachers will implement *Sensory Friendly Classroom Design and Instruction* with the belief that their teaching practices will expand and better support all students. The guidebook is intended to guide teachers in their creation of a sensory sensitive learning environment that, in turn, will reduce maladaptive behaviors in students with disabilities such as ASD and ADHD.

The author plans to pilot the implementation of *Sensory Friendly Classroom Design and Instruction* at an elementary school in Los Angeles, California. She will take academic and behavioral data throughout the 2019-20 school year. This data is anticipated to show improved academic achievement and reduced disruptive behaviors, which provides support of her proposal for school-wide implementation.

Lessons Learned and Educational Implications

The process of composing the guidebook, *Sensory Friendly Classroom Design and Instruction*, was a challenging, yet enjoyable, task. The author learned about a very specific disorder that affects children with various disabilities and those with no identified disability at all. The direct correlation between SPD and academic achievement was eye opening to the author and inspired her to discover ways to prevent this disorder from negatively impacting children's growth and social and academic development.

The main achievement and recognition taken from creating this project is the importance of allowing the learning and knowledge to guide the process. The author had an established plan and vision for the project when she started, however, the finished product was far greater in breadth and depth than what was originally intended. Her understanding of SPD and how it negatively impacts students in the classroom inspired her to do more, to dig deeper into the research and work harder to create a handbook of value for this population. She allowed her research and new understandings to direct her in creating a resource that teachers can use to meet the sensory needs of their students in all ways throughout the school day. She firmly believes the implementation of *Sensory Friendly Classroom Design and Instruction*, in collaboration with district occupational therapists and education specialists, will greatly reduce maladaptive behaviors and increase academic achievement of students with SPD in the classroom.

The author also learned about the substantial importance of designing a classroom. She had always dreamed of creating a “Pinterest Perfect” classroom, full of colors and over the top decorations. Designing a guidebook for sensory friendly classrooms has altered her fundamental idea of what a “Pinterest Perfect” classroom truly is. The decisions made in decorating a classroom must have purpose and intent behind them to avoid unnecessary stimulation and disruptive behaviors. Classrooms are places where all students need to feel comfortable, safe, supported and encouraged to grow, both academically and socially. Teachers have a responsibility to designing their rooms in ways that allow for such growth to be made.

The author encourages teachers of all grades to take time to learn about the needs of their students, especially those with disabilities. She recommends talking to students and families about what they need in order to be successful in the classroom and what hinders their growth. By acknowledging the students’ specific needs and asking for their input, the student will feel

heard, appreciated, and responsible for their own learning. *Sensory Friendly Classroom Design and Instruction* provides strategies and ideas to incorporate in classrooms, but the most authentic source of information lies in the students themselves.

Conclusion

Inclusive classrooms create a beautifully diverse population of students who are provided the opportunity to learn together. While meeting the needs of these varied students is challenging and potentially overwhelming, the reward of watching students grow in ways that go far beyond academics makes it all worthwhile. Educators who strive to meet the needs of their students with disabilities can make a difference in propelling these students to reach their potential. *Sensory Friendly Classroom Design and Instruction* is the author's way of spreading the belief that all students learn and progress when given the support and acceptance everyone deserves.

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Appendix A

Sensory Friendly Classroom Design and Instruction Guidebook



**Sensory Friendly Classroom
Design and Instruction**

Lindsey Lawlor

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2019

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INTRODUCTION

Sensory Friendly Classroom Design and Instruction is your guide to constructing a learning environment that is sensitive to the needs of students with sensory processing disorder. This manual provides tools and strategies to use not only as physical modifications in your classroom, but as supports during instruction and academic tasks, as well. The implementation of *Sensory Friendly Classroom Design and Instruction* will decrease disruptive behaviors from students whose needs are being met. The reduced prevalence of maladaptive behaviors will result in increased levels of focus and ultimately, academic and social growth.

RATIONALE

As a teacher, you know each child who steps foot in your classroom achieves success in a different way, both socially and academically. The children that fill the seats in your classroom present diverse learning styles, challenges, and gifts. Their success depends on your ability to meet each student where they're at, provide them access to their education, and support their social and emotional growth both in and out of the classroom.

The diverse learner population your classroom walls

"1 in 6 children have sensory challenges that make learning and functioning in school incredibly difficult."

may now include students with disabilities. Wahoo! Children with unique learning needs bring new educational opportunities for each and every person in the classroom, including you. The inclusion of students with disabilities calls for teachers to expand their teaching tool belt in order to support each and every students' social, emotional, and academic growth.

Students with disabilities, such as autism spectrum disorder (ASD) or attention deficit hyperactivity disorder (ADHD), are

often additionally challenged by sensory processing disorder (SPD) (Cheung & Siu, 2009).

1 in 6 children have sensory challenges that make learning and functioning in school incredibly difficult (Ben-Sasson, Carter, Briggs-Gowan, 2009). Unfortunately, research has found students with SPD to be inattentive and underperforming academically in general

Education classrooms (Ashburner, Ziviani, & Rodger, 2008). Children with sensory processing difficulties

often engage in physical and verbal behaviors in an attempt to bring their internal sensory systems back to a manageable level (Lane, Young, Baker, & Angley, 2010). These behaviors are often disruptive to the class and attract negative attention from peers. The academic and social aspects of a child's success are directly impacted by the presence of a sensory processing disorder.

The design of a classroom and instructional elements of a lesson impact

the ability of students with sensory processing challenges to make academic growth and meet the social expectations of their peers (Howe, Brittain, & McCathren, 2004). Children with SPD have to work harder than others to participate in an environment in which their sensory needs or either not being met or being overstimulated. A classroom that meets those specific needs sees less disruptive

behaviors, which results in increased attention and engagement during instruction, which ultimately increases academic and social success in students with SPD! *Sensory Friendly Classroom Design and Instruction* is your guide to constructing a welcoming classroom that balances the sensory needs of all of your learners.

WHAT IS SPD?

Humans have eight sensory systems: visual, auditory, olfactory, gustatory, tactile, vestibular, proprioceptive, and interoceptive. We depend on our nervous system to receive, process, and facilitate responses to the input we receive through these senses. Sensory processing disorder causes the brain to improperly interpret the sensory input and trigger inappropriate responses in the individual (Cheung & Sui, 2009). SPD commonly manifests in children with autism spectrum disorder (ASD) and/or attention deficit hyperactivity disorder (ADHD) (Cheung & Siu, 2009). Individuals with SPD often have difficulty integrating sensory input from more than one system. During instructional time in the classroom, for example, a student with SPD may have difficulty understanding verbal directions while simultaneously focusing on visual input.

SPD is categorized into three different types of responses to stimuli:

over responsive (hyper responsive), under responsive (hypo responsive), and sensory seeking (Engel-Yeger & Ziv-on, 2011). Over responsiveness is an intense reaction to sensory stimuli that happens quicker than a typical response or endures for a longer time. This type of SPD typically triggers negative, aggressive, or avoidance behaviors. Under responsiveness to sensory stimuli refers to an individual's inability to detect sensory input. Someone who's brain dismisses sensory information may seem as though they feel sluggish, disinterested, and unmotivated. Sensory seeking behaviors serve as a way for the individual to meet the threshold of sensory input their body is demanding (Engel-Yeger & Ziv-on, 2011). Table 1 differentiates the adaptive behaviors and work habits students may present at school for each type of SPD (Murray, Baker, Murray-Slutsky, & Paris, 2009; Dellapiazza, Michelon, Marie-Joelle, Robel, Schoenberger, Chatel, & Vespini, 2019).

TABLE 1

Comparison of Three Types of SPD

Sensory Seeking	Under Responsive	Over Responsive
<ul style="list-style-type: none"> - Requires extra sensory input with high intensity - Uncoordinated, hyperactive, easily distracted, impulsive - Touches, licks, mouths objects - Touchy and aggressive with others - Messy, disorganized work - Turns in papers with holes and rips from too much pressure when writing - Disorganized desk, backpack - Avoids tasks 	<ul style="list-style-type: none"> - Passive, quiet, unengaged - Unaware of people and surroundings - Isolated from peers - Appears to be “daydreaming” - Low motor skills, endurance, and strength - Easily overlooked - Avoids tasks 	<ul style="list-style-type: none"> - Dislikes loud noises/surroundings - Dislikes physical touch, textures, getting dirty - Visually distracted by wall decor - Walks on toes - Chews items - Messy, disorganized work - Emotionally reactive - Anxious, stressed, irritable - Throws, hits, pushes, elopes - Refuses to interact with peers - Avoids tasks

BE INTENTIONAL

Inclusive general education teachers are challenged to adapt their teaching style, rethink their classroom design, and create lessons with increased scaffolds and supports. It may sound like a lot of extra work, because it is. The benefits from a dedicated teacher who supports the beautiful diversity in a classroom, however, are endless.

You can create a sensory friendly learning environment by making intentional decisions you know will benefit your students. This guidebook is a resource for you to use as you design your

classroom and create effective lesson plans. From color scheme and seating arrangement to multi-modal lessons and brain breaks, you will be able to make informed decisions with confidence.

Whether this is your first inclusive classroom or you're an experienced inclusion teacher in need of strategies to support your students with exceptionalities, *Sensory Friendly Classroom* is your guide to designing a classroom and implementing instructional strategies that meet the various sensory needs of your learners.

"We can teach our children to flap their wings, but conditions have to be just right for them to fly."

-Annie Campbell

CLASSROOM DESIGN

From the decorations on the wall to the type of lighting in your classroom, the design of your students' learning environment majorly impacts their sensory systems. A child with SPD responds to their physical surroundings differently than their typical peers, which negatively impacts their academic and social success. Throughout this chapter, you will find research-based strategies to consider when creating your sensory friendly classroom that supports the success of all types of students.

COLOR SCHEME

The color scheme of your classroom is just one aspect of visual stimuli children must process throughout each day. Children with SPD are internally affected by the colors of their environment (Engelbrecht, 2003). Certain colors give off shorter wavelengths than others, thus generating less stimulation in the brain. These are known as calming colors. Brighter colors can spark internal feelings of chaos and over-stimulation in children with sensory challenges. Because children with SPD have difficulty organizing input from multiple sensory systems simultaneously, it is crucial to keep visual stimuli to a minimum (Kofler, Rapport, & Alderson, 2008).

Choosing a tranquil color scheme is the first step in designing a sensory friendly classroom. Blues and greens prompt feelings of calmness, relaxation, and comfort. These colors will also elicit the calming sensation in your typical learners who may not be as sensitive to visual stimulation. Avoid bright colors or the combination of many colors together. Children with SPD are sensitive to the internal sensations caused by the visual input being received.

The next section provides information on classroom decorations and their effects on children's sensory systems.

DECOR

I know how tempting it is to go overboard on classroom decorations, especially when you're walking through Target and you lose all self-control because what room doesn't need a giant inflatable rainbow? We need to put our students' needs first, establish a bit of restraint, and recreate the concept of a "Pinterest Perfect" classroom.

Classroom decorations need to meet two criteria: (1) mindful of the sensory stimulation it creates in students, and (2) purposeful. With a color scheme in place that keeps students feeling calm, cool, and collected, you want to continue down that path, while also creating a space that feels welcoming to both you and your students.

When decorating the walls of your sensory friendly classroom, be mindful of the number and placement of stimuli you are presenting to your students. When too many anchor charts, colors, textures, decorations, etc. are placed together in a small area, visual noise is created. Also consider adding your visual accents on the walls slowly over time so as to avoid

overloading visual input too quickly. Visual noise makes it difficult for all students to process other sensory information, such as verbal directions, due to the amount of energy and focus being used to sort through the visual cluster (Kofler, Rapport, & Alderson, 2008).

You first must decide what kinds of décor you want to include in your sensory friendly room: anchor charts, student work, motivational posters, calendars, birthday chart, word wall, etc. The possibilities are endless! The next step is choosing where you are going to put all of these beautiful and purposeful decorations. To avoid visual noise, it is ideal to keep the wall relatively empty behind the area where the majority of instruction will take place. This supports students in attending to you and your instruction, rather than the pictures and posters that clutter the wall behind you (Milo-Shussman, 2017). Another helpful tip to avoid visual noise is to ensure there is empty space that breaks up the pieces of décor hanging on the walls.

Ask yourself the following questions when deciding if your classroom decorations are sensory friendly:

- Are my students with SPD going to be able to be overstimulated looking at this wall?
- Are there areas of empty space between groups of décors?
- Is the wall behind where I provide instruction minimally decorated?
- What purpose do my decorations serve?

Ask yourself the following questions when deciding if your classroom decorations are sensory friendly:

- Are my students with SPD going to be able to be overstimulated looking at this wall?
- Are there areas of empty space between groups of décors?
- Is the wall behind where I provide instruction minimally decorated?
- What purpose do my decorations serve?

Next, we look at the impact of the physical arrangement and organization of a classroom on students with sensory processing challenges.

PHYSICAL ARRANGEMENT & ORGANIZATION

Your classroom arrangement establishes a flow for your students and affects the overall mood and energy of your classroom. There are several considerations to keep in mind as you organize your sensory friendly classroom in a way that will allow your students to meet their diverse sensory needs.

The furniture arrangement plays a major role in the way you and your students will move throughout the room. Students with sensory needs are sensitive to touch, noise, and movement. It is imperative your classroom is easy to navigate with open pathways between desks, tables, counters, chairs, etc. With more room to move and clear pathways to follow, children will evade collisions and unwanted sensory input from peers such as touches, noises, and smells.

If you teach primary grades, K-3, you most likely will have a rug designated for certain activities such as morning meetings, read alouds, math talks, etc. Establishing designated student seats on the rug either by color, number, tape, etc. will allow for smoother transitions. Smoother transitions mean calm

classrooms, less chaotic movements, and mellow conversations, which ultimately avoid triggering a student with an over responsive sensory system.

Maintaining a classroom environment that promotes meaningful interactions among peers is influenced by the organization of classroom tools, supplies, and special areas. To avoid creating unwanted social areas, separate the most commonly used tools like the pencil sharpener, trash cans, water fountain, class library, etc. Distractions from single students making meaningful movements around the classroom are much less distracting than peer groups gathering at the water fountain during reading rotations.

Depending on the types of sensory needs you are working to meet in your adapted classroom design, the placement of commonly used classroom supplies can be beneficial to your students' sensory regulation. If they need increased movement and proprioceptive input, assign classroom supplies' a home base in which students will need to bend, reach, or stretch to access them. Keeping your

students with these needs physically active with support their level of engagement in the activity to follow.

The organization of the hundreds of teaching tools and resources you have accumulated throughout your career goes hand in hand with making intentional choices in classroom decorations. Items on bookshelves and clutter on countertops are considered visual distractions and should be minimized or hidden in storage areas whenever possible. An easy, affordable way to make your bookshelves more sensory friendly is to Velcro a piece of fabric across the top to cover the many distracting colors, shapes, and textures filling the shelves.

As you know, there are three ways children experience SPD: sensory seeking, under responsive, and over responsive. Establishing areas in your classroom where all of these needs can be satisfied will support the inclusion of these unique learners. If you create designated spaces for students to meet their sensory thresholds, they will be more apt to attend to you, your instruction, and the task at hand (Hill, Trusler, Furniss, & Lancioni, 2012). Some of your students will need a

place to be active and achieve increased sensory input, while others will need quiet, dark areas where they can reach internal comfort before meaningfully engaging with the class.

With all the necessary tools, these SPD needs can be met in one space! There should be enough of an open area for movement (spinning, rocking, jumping, etc.) and opportunities to satisfy any of the 7 sensory systems. To support students with hyper-responsive sensory systems, ensure tools are available to stop the input such as noise cancelling headphones or a way to block the light. Table 10 lists ideas of what items to include in this area or contact your district's Occupational Therapist for additional support in building an effective sensory space. When informing your students of this space, it is important to ensure it is available for all children. You do not want to create a stigma or social barrier between typical peers and students with unique needs. By establishing the sensory space as a helpful tool in your classroom and informing all students how to effectively use it, you may end up supporting the needs of more students than you expected.

SEATING OPTIONS & ARRANGEMENTS

Incorporating flexible seating has been an increasingly hot topic in the world of education in recent years. Does it offer any benefits? Yes! Your students with sensory systems that crave for proprioceptive input, seating options are a game changer. Just like the previous sections, the options you provide your students should be done so with purpose and intent. Students attention will be more focused on your instruction than the physical discomfort they experience from the traditional plastic school chairs if they have alternative choices in which they can satisfy their proprioceptive needs. The hard-plastic chairs that students sit in all day long obscure the natural movement children need to achieve this type of sensory input (Riffel, 2014).

There are various seating options that will provide students the necessary sensory input and refocus their attention in class. To support students in this way, consider providing air cushions or pillows to place on their seats, establishing standing work areas, and chairs that rock. Research has found that replacing chairs with therapy balls to sit on in the classroom shows increased levels of

engagement and social interaction in students with developmental disabilities, including SPD (Bagatell, 2010).

If flexible seating isn't your game, don't worry! There are other ways you can support your students with sensory needs. You will find examples of sensory input tools you can provide students in ways that may work better for you and your classroom in Table 6-10.

Seating arrangements play an important role in preventing SPD triggered behaviors. The configuration of student desks is always dependent on the class dynamics, individual needs, available space, and you, of course. Research has found certain seating arrangements to decrease off-task behaviors more than others (Simmons, Carpenter, Crenshaw, & Hinton, 2015). The study found that off-task behaviors, specifically inappropriate talking, reached the highest levels in group seating plans, and the lowest levels in row seating. While seating designs don't need to remain constant throughout the entire school year, it is beneficial to consider the sensory impacts of various seating arrangement styles.

Cluster seating allows for the most off-task behaviors, especially undesired student talking. Imagine a scenario in which you are teaching a lesson, including visuals and verbal directions, and the students sitting in one of the clusters are engaged in off topic discussions. Seated in that group is a student with SPD. While it may be easier for a typical learner to ignore the talking at the table group, the student with SPD is already fighting to sort out the auditory information you're sharing, while also processing the visuals on the board. When you add in the distracting talking among the table group members, the student will most likely become overloaded, or at least distracted, both of which hinder their learning.

Regardless of the formation you choose to arrange student seats in, there are a few considerations to keep in mind

for student placement. Your goal in supporting students with SPD in the classroom is to minimize distracting sensory input. This is a perfect opportunity to open a conversation with your students with sensory needs and ask what seating supports they need. Typically, these students benefit from being seated away from outside noise (doors, windows), projectors, and the trash cans. They will have an easier time attending to instruction if their seat faces the main instruction area. These few adjustments to student seating eliminate unnecessary sensory input that may have harmful implications on academic and social growth.

The next section discusses environmental considerations in your sensory friendly classroom.

ENVIRONMENT

Classrooms are a second home to both you and your students. Your classroom is a place where children, regardless of ability, should feel comfortable, relaxed, and supported. In a sensory friendly classroom, the environment you create can make a world of difference to your exceptional learners. There are several environmental modifications found to positively impact the sensory stimulation of children with SPD.

When you are writing lesson plans, creating activities, or focusing on a task in general, do you find yourself to be more attentive with soft, calming music playing in the background? Chances are you answered yes! Playing music with a rhythm of 60 beats per minute (bpm) in your classroom fosters a calm environment where students stay focused and attentive to tasks. Playing music with 60 bpm matches the desired resting heart rate of 60 bpm.

When the students in your classroom are focused and working, they will display fewer off task behaviors, thus reducing the amount of distractions on

others. Background music should only be played when there is no verbal instruction taking place, as students with SPD may have difficulty organizing the multiple forms of auditory input. There are a few considerations to playing background music in the classroom. If you decide background music is not working for you and/or your students, playing white noise during student work time will support your students with SPD who have difficulty tuning out the buzzing of the lights and other sounds we don't typically hear. If you have a student who struggles to maintain focus with background music, regardless of presenting with SPD, having noise cancelling headphones available is a great solution. Table 10 provides a list of sensory tools to keep in your classroom, such as noise cancelling headphones.

The fluorescent lights that are commonly found in classrooms are often obstacles students with SPD must face on a daily basis. These flickering, buzzing, non-natural light fixtures make visual and auditory attention in school nearly impossible. For students with over responsive sensory system, fluorescent lights may be causing physical pain to their

eyes, ears, and brains. Imagine trying to learn in your classroom when you can barely open your eyes and the buzzing of the lights is too loud to ignore. If you're teaching in a classroom with fluorescent lights, there are various ways to lessen the visual stress and auditory distractions these lights have on your students with SPD.

Increasing the amount of sunlight available to your students is crucial.

Whether that be through windows or time spent outside, sunlight is beneficial to students. Sunlight contains blue light, which has the strongest effect on a person's cognitive performance (Vandewalle, Maquet, Dijk, 2009). Allowing students to work outside or take sensory walks out in the sunlight is a beneficial way to increase the amount of blue light they have access to. If a student with SPD or ASD in your classroom is sensitive to sunlight, encourage them to take sunglasses with them outdoors to soften the exposure.

Avoiding fluorescent lighting altogether is another option to breaking down this barrier for children with SPD. Using floor lamps throughout the classroom instead of the harsh, overhead

lighting fixtures brings less harmful, warm light into your room. Implementing this strategy will create an even more comfortable environment in your room, though you must be persistent on keeping the cords tucked away and out of the way of students to avoid possible safety hazards. Consider the activities in your classroom, student behaviors, and potential risks when using floor lamps.

Light filters are an easy, cost effective strategy that minimizes the amount of fluorescent light cascading into your classroom. These soft light filters are pieces of cloth, with varying colors and patterns to choose from, that drape below the lighting fixtures in the ceiling. They mute some of the harsh rays that are so disturbing to the eyes and ears of students with processing difficulties.

Children with sensory processing disorder are often extremely sensitive to smells. An aroma that is barely detectable to you and me may be so intensely foul to a child, they gag /vomit because of it. The types and degrees of sensitivities to aromas are individual to each child, so I do not have a list of best air fresheners for your classroom. However, I encourage you to have an open conversation with any

students who are sensitive to smells about potential aromas in the classroom to keep the air fresh.

Consistency and structure are essential during the school days with your exceptional learners. Establishing consistent routines and schedule will support your students who benefit from knowing what to expect each day, like those with SPD, ASD, and/or ADHD. Posting a schedule for each day lessens the anxiety felt in these students who have difficulty transitioning between activities and coping with unforeseen obstacles. Keeping your school day filled with daily routines, structure, and consistency creates feelings of security and autonomy within your students (Howe, Brittain, & McCathren, 2004). On special days, when there is a fire/earthquake drill, altered school hours, assemblies, etc., ensure you prepare that student early on by informing them of the change in schedule and giving them the tools, they will need to be successful in that unexpected transition.

Aside from the physical aspects of your classroom environment, you must also attend to the community building that starts on the first day of school with your new class. Morning meetings and/or circle

time is time for students to learn from one another and practice their social skills, along with working together to problem solve and support each other's critical thinking. Morning meetings are a time for students to learn about one another by engaging in respectful discussions about relevant topics to them. While your students with disabilities may be challenged to share, their participation in this process is imperative. Class circles are opportunities for students with disabilities to learn from their typical peers and be immersed in their social interactions (Morcom & MacCallum, 2012). Typical peers are provided the opportunity to learn about their peers with differences, ask questions, and find similarities. Engaging in these social circles cultivates a learning environment in your classroom where peers support, accept, and welcome one another, regardless of ability.

Students with SPD may benefit from various supports during these class meetings. In order to attend to the auditory input being received during these class discussions, children may need various tools to regulate their other sensory systems. Allowing for alternative

seating and/or fidget tools may support a student's success in participating with their classmates in the social circle. Table 6 and Table 9 list various seating options

and fidget tools that would be perfect to offer during this community building activity.

SUMMARY

Physical modifications to your classroom, big or small, will prove beneficial to your students with a sensory processing disorder. When you create a classroom environment that is sensitive to the sensory needs of your students and spend time building a community among your class, your children will thrive. Making intentional, informed decisions in designing your classroom environment and being mindful of your students' sensitivities is equally as important as the lessons you teach. In the next chapter, *Instructional Strategies*, you will learn various ways to incorporate sensory integration in your lessons while providing opportunities for learners with SPD to meet their needs.

INSTRUCTIONAL STRATEGIES

Students with SPD often disengage from academic tasks and instruction due to their need to either meet their sensory needs or avoid overstimulation. The maladaptive behaviors they have learned are harmful to their academic and social success. With a sensory friendly learning environment designed to meet the needs of all your learners, your lessons will follow in suit with the strategies found in this chapter. Students with sensory seeking behaviors, under responsive, or over responsive sensory systems have different needs and benefit from supports that meet their individualized needs. In this chapter you will find instructional strategies and supports to best facilitate meaningful engagement in your students with SPD.

GENERAL SUPPORTS

First, we'll start off with strategies and supports to use when teaching students with SPD of any type along with your typical learners. In order for students with atypical sensory regulation to be ready to learn, they first need to awaken their minds and move their bodies. Movement breaks in the classroom need to be designed with purpose rather than encouraged chaotic wiggles. When students are given the opportunity and direction to achieve the sensory input they need before a lesson, they will be able to "organize their body, level of arousal, and attention for function," (Murray, Murray-Slutsky, & Paris, p. 247, 2009). Table 5 provides a full list of intentional movement opportunities and sensory breaks for students. When a student's mind and body's sensory needs are satisfied, their levels of attention and engagement will rise.

Collaborate with your school's education specialist and occupational therapist for support in teaching appropriate coping strategies to your sensory sensitive students with maladaptive behaviors. The behaviors they display that can be volatile,

disruptive, and seemingly unprovoked are their way of communicating to the adults in their environment that they are in need. Visuals, code words, or signals are effective communication strategies for students with sensory processing challenges to let their teacher know they are either over stimulated or in need of input. Often students with SPD engage in task avoidance behaviors, as described in Table 1. These new communication strategies will not come quickly, but if you are patient and supportive, your students will benefit greatly, academically and socially, from their new communication tools.

Positive behavior supports will make a world of difference as young students learn new communication tools and coping strategies. Providing rewards and incentives during the process will encourage the adoption of the child's new tools, thus decreasing maladaptive behaviors (Murray, Murray-Slutsky, & Paris, 2014). Using discipline for a child's behavior that is derived as a form of communication about their disability and internal feelings is unfair and should never happen in a sensory friendly classroom. As

the teacher, you must stay calm and do what you can to understand what your

student is trying to communicate in their time of need.

SENSORY SEEKING SPD

Students with SPD who are classified as sensory seekers are trying to meet their sensory threshold through receiving extra input from their surroundings. When they are unable to meet their needs, they are unable to focus on academic tasks. You will often find these students avoiding tasks due to their need to touch and mouth items, which

easily distracts their focus and results in messy and disorganized work. When sensory seeking students are able to reach their sensory threshold, it is easier for them to maintain focus on the task at hand (Riffel, 2014). Table 2 provides strategies and supports for your sensory seeking students in the areas of reading, writing, and math.

TABLE 2

Supports for Sensory Seeking Students

READING	WRITING	MATH
<ul style="list-style-type: none"> - Act out story - Read in other areas around room - Read in desired position (flexible seating) - Listen to story on headphones - Reading tracker/window - Chew gum - Turn classroom lights off and read with a flashlight - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Act out writing - Write in other areas around room - Write in desired position (flexible seating) - Finger write letters/words in trays of sand/salt/shaving cream - Use colored pens/markers - Use pencil grips - Write with sandpaper underneath writing surface - Write on incline board/easel - Write with vibrating/weighted pencil - Use scented markers - Use chewable pencil toppers - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Place flashcards on ground to jump/stomp on them and answer - Write numbers/equations in trays of sand/salt/shaving cream - Make numbers using play-dough - Use varying manipulatives - Songs with gestures - Play classical music/white noise in background

UNDER RESPONSIVE SPD

Students with under responsive sensory systems can be easily overlooked by teachers, unfortunately. These students are not disruptive, but quietly disengaged from their peers and academic instruction. They seem to be unaware of people and their surroundings and often isolated from their classmates. You will find these students avoiding their tasks due to “daydreaming” behaviors (Riffel, 2014).

Their sensory systems need intense input and will respond better to high energy and animated teaching styles (Murray, Murray-Slutsky, & Paris, 2009).

Many of these strategies are used with sensory seeking students as well due to the benefits of increased sensory input. Table 3 provides reading, writing, and math strategies to support your students with under responsive sensory systems.

TABLE 3

Supports for Students with Under Responsive Sensory Systems

READING	WRITING	MATH
<ul style="list-style-type: none"> - Act out story - Read in other areas around room - Read in desired position (flexible seating) - Listen to story on headphones - Reading tracker/window - Chew gum - Turn classroom lights off and read with a flashlight - Read in different voices: robot, whisper, nasal, low tone, high tone, etc. - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Act out writing - Write in other areas around room - Write in desired position (flexible seating) - Finger write letters/words in trays of sand/salt/shaving cream - Use colored pens/markers - Use pencil grips - Write with sandpaper underneath writing surface - Write on incline board/easel - Write with vibrating/weighted pencil - Use scented markers - Use chewable pencil toppers - Write on raised lined paper - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Place flashcards on ground to jump/stomp on them and answer - Write numbers/equations in trays of sand/salt/shaving cream - Make numbers using play-dough - Use varying manipulatives - Songs with gestures - Practice math facts/counting while rhythmic jumping on trampoline - Play classical music/white noise in background

OVER RESPONSIVE SPD

Students with over responsive have very different needs than sensory seeking students and those with under responsive sensory systems. Students with over responsive sensory systems can be extremely sensitive to any type of sensory input, therefore benefiting from modifications to their environment. Overstimulation and internal discomfort are usually triggered by loud noises, touches, textures, and the feeling of getting dirty. This student may be easily distracted and overwhelmed by visuals, constantly walks on their toes, and chews on objects. Task avoiding behaviors such as becoming emotionally reactive, throwing, hitting/kicking, eloping, and refusing to interact with peers are common strategies these children use to avoid the pain overstimulation they anticipate. Children with over responsive sensory systems may exhibit anxious and stressed patterns of behavior as they attempt to navigate their environments, which results in disorganized and messy work (Riffel, 2014).

As mentioned in the *Environment* section earlier, it is best these students are presented with a consistent daily schedule with visuals. To avoid triggering maladaptive behaviors and overstimulating these students, try to teach with a lower volume and slowed speech pattern than you are used to (Murray, Murray-Slutsky, & Paris, 2009). The hands-on activities you plan to do with your students may involve textures, scents, sounds, and visuals that are overstimulating at first to these students. Without forcing them to go all in immediately, slowly desensitize your students by having them work in the proximity of the activity and slowly introduce them to the materials over time. Consult your occupational therapist and education specialist for support on the process of desensitization. Your goal is to support your students' growth and progress in expanding their environmental interactions, not removing them altogether. Table 4 offers strategies to best support the academic and social success of your over responsive students:

TABLE 4

Supports for Students with Over Responsive Sensory Systems

READING	WRITING	MATH
<ul style="list-style-type: none"> - Read in other areas around room - Read in desired position (flexible seating) - Cover pages with paper, uncover line by line - Reading tracker/window - Use colored overlays on bright white paper - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones/earplugs - Read "big books" (added weight) - Chew gum - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Write in other areas around room - Write in desired position (flexible seating) - Utilize color coding - Reduced amount of handwriting - Velcro words onto laminated sheets - Use speech-to-text - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones - Provide written directions in small steps - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Cover page with paper, uncover 1 problem at a time - Use colored overlays on bright white paper - Velcro numbers onto laminated activity - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones - Provide written directions in small steps - Play classical music/white noise in background

SENSORY BREAKS

The importance of movement integration in the classroom today is widely known and practiced. All students' engagement and on task behaviors increase when given ten-minute breaks during lessons (Howie, Beets, & Pate, 2014). If students with typical processing abilities benefit from brain breaks, your students with processing difficulties will benefit even more! Incorporating sensory breaks into your daily routines provides proprioceptive and vestibular input your learners with sensory needs crave. Many of these sensory break opportunities can be turned into "classroom jobs", which allows for natural opportunities for students with sensory needs to regulate their systems without drawing unwanted attention from their peers. There are three types of sensory breaks: heavy work activities, movement, and deep pressure. Table 5 presents sensory break ideas.

Allowing students to use fidget tools is essential to student success in your

sensory friendly classroom. The tactile input and repetitive motor movement of using a fidget tool supports sensory processing in children. Fidget tools, when used purposefully, allow the child's brain to filter out the unnecessary, distracting input being received through their 8 senses, such as scents, buzzing lights, the feeling of clothes on their skin, etc. Student retention may increase by as much as 37% when given access to a fidget during academic tasks and instruction (Riffel, 2014).

Fidget tools are easily created from objects you have throughout your classroom and can be purchased at low costs for your students. Table 9 provides a list of fidget tool ideas for you to include in your classroom. Be sure to discuss expectations of using fidget tools with your students to avoid their misuse and potential distractions.

TABLE 5

Types of Sensory Breaks

HEAVY WORK ACTIVITIES	MOVEMENT	DEEP PRESSURE
<ul style="list-style-type: none"> - Stack chairs - Return library books - Erase board - Hold door open for class - Wall push ups 	<ul style="list-style-type: none"> - GoNoodle - Yoga - Songs with gestures (“Hokey Pokey” “Head, Shoulders, Knees, and Toes” “Simon Says”) - Animal walks - Jumping jacks - Rhythmic jumping on trampoline - Classroom messenger - Materials manager - Office runner - Paper passer 	<ul style="list-style-type: none"> - Weighted lap pads - Weighted blankets - Weighted vests

SUMMARY

Children with SPD depend on you to provide them the necessary supports that allows them the greatest chance to be successful in your classroom. Depending on their needs, the strategies and supports differ, which is why it is imperative for you to take the time to learn about these students and find out what their unique needs are. Incorporating natural sensory breaks into your daily routine will benefit every child in your classroom, not just those with unique needs. While fidget tools may be intimidating, keeping them readily available and appropriately used by your responsible students will prove beneficial to all.

SENSORY TOOLS

Throughout this chapter, you will find lists of the sensory supports and accommodations that were mentioned throughout the guidebook. This information is organized by the type of supports and accommodations. Getting your hands on these supports does not have to be expensive! Looking online, shopping at thrift stores, and digging through your school’s old furniture is a great way to start. Many of these supports can be DIY (Do It Yourself)!

TABLE 6

SEATING OPTIONS	
Wobble Stool	Bean Bag
Rocker Chair	Lap Desk
Therapy Ball	Easel
Stand Up Desk	Carpet Square
Air Cushion	Exercise Band

Table 7

ENVIRONMENTAL MODIFICATIONS	
Sunglasses	Sensory Space
Floor Lamps	Sensory Wall
Light Filters	Sensory Bin
Weighted Backpack	Headphones/Earplugs
Weighted Lap Pad	Visual Schedule
Weighted Vest	Diffuser
Weighted Blanket	Trampoline

TABLE 8

INSTRUCTIONAL SUPPORTS	
Reading Tracker	Pencil Grips
Vibrating/Weighted Pencil	Pencil Toppers
Sandpaper	Vibrating Watch
Raised Lined Paper	Hula Hoops
Colored Overlays	

TABLE 9

FIDGETS	
Chewing Gum	Wikki Sticks
Stress Ball	Velcro
Putty/Clay/Slime	Fidgets

Table 10 lists recommended equipment and tools to incorporate in the Sensory Space of your classroom. Remember, this area is used for students who need extra sensory input or decreased sensory input. Your Sensory Space is a safe environment in which students are free to regulate their systems and get back to a mental space where they are ready to learn. Establishing expectations and time regulations is crucial in ensuring successful and effective use of the Sensory Space.

TABLE 10

SENSORY SPACE	
Headphones/Earplugs	Dark Curtains
Weighted Blanket	Tent/Teepee
Sleeping Bag	Fidget Toys
Pillows	Resistance Bands
Bean Bag Chair	Tactile Books
Sensory Wall	Visual Timer
Sunglasses	

CONSIDERATIONS

If only creating the perfect learning environment were as simple as changing the decorations on the wall. Intentional classroom design and specific sensory supports are essential for student success, however there are several considerations throughout this process. As you now know, SPD is unique to each and every person who lives with it. Take time to learn your students' behaviors and triggers. Engage in open and accepting conversations with your students with SPD and their families to learn about their likes and dislikes and ways in which they best feel supported. If your student has an IEP, talk with the team, including the parents, to ensure the strategies and supports you are applying in the classroom match what is happening at home. Remember, consistency is key to student growth! After you have gotten to learn your students and observe their behavior, you then have the information you need to make the appropriate environmental and instructional modifications. Your classroom environment each year should be based upon the needs of the students who walk through the door each day.

Students may want to take advantage of the supports and environmental modifications in your sensory friendly classroom and misuse them. Guiding a class discussion in which rules and expectations are generated by the students will give them a sense of ownership and accountability of their classroom supplies. All of the classroom modifications and instructional supports are included in this manual for a reason. Intentional use and meaningful interaction are necessary to achieve a truly sensory friendly classroom.

CONCLUSION

Sensory Friendly Classroom Design and Instruction consolidates evidence-based practices into an easy to follow, teacher friendly manual. Allow these chapters and resources to guide you on your journey in creating a learning environment that meets the sensory needs of your students with disabilities, like autism and ADHD. A classroom that embraces the specific needs of all the students inside will see benefits that go beyond academics. When children's needs are met and they feel secure and supported in their environment, they will thrive, regardless of ability. Maladaptive behaviors in students with SPD are minimized in a sensory friendly classroom which encourages social interaction and further development of social skills. Sensory friendly classrooms support the whole child- academically, socially, and behaviorally.

Opening a class conversation about SPD will support the community building in your classroom. Help your students to understand one another and see each other in a different light. I encourage you to take on the role of one of your students with SPD. Have a seat at the student's desk and visualize a day in his/her position. What distractions capture your attention? Is the main area of instruction in your line of sight? Starting conversations and stepping outside of yourself is the first step in truly supporting those who need it in genuine and effective ways.

A sensory sensitive learning environment where the individualized needs of every student are considered when developing and adapting lessons deserves to be celebrated. Your students will feel so grateful and lucky to be given the opportunity to learn with you!

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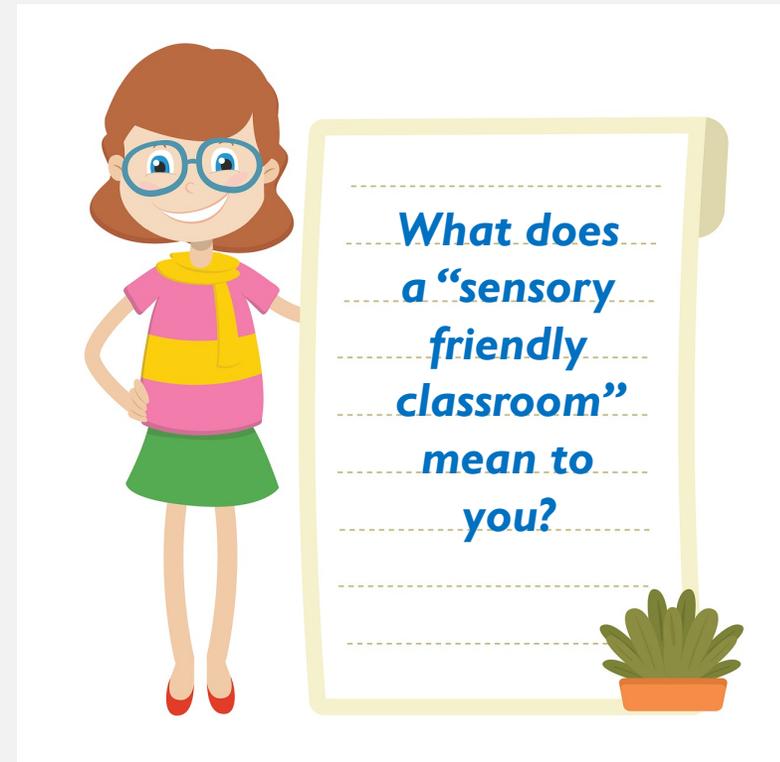
Appendix B
Sensory Friendly Classroom Design and Instruction Professional Development

SENSORY FRIENDLY CLASSROOM DESIGN & INSTRUCTION

Professional Development

AGENDA

- INTRODUCTION
- CLASSROOM DESIGN
- INSTRUCTIONAL STRATEGIES
- CONSIDERATIONS



INTRODUCTION

WHY?

- 1 in 6 children have sensory issues that make it difficult to learn and function in school
- SPD common in children with ASD & ADHD
- Studies show academic underachievement and inattention in students with SPD
- Classroom design and instruction can easily become overstimulating

WHAT IS SPD?

SENSORY PROCESSING DISORDER

Brain does not process & organize sensory information correctly

Individual responds to sensory input inappropriately

3 types:

Sensory Seeking

Under Responsive (Hypo responsive)

Over Responsive (Hyper responsive)

Think about your daily routines. What kinds of sensory input are kids experiencing throughout the day in your classroom?

Sensory Seeking	Under Responsive	Over Responsive
<ul style="list-style-type: none"> • Requires extra sensory input w/ high intensity • Impulsive, easily distracted • Touches, licks, mouths objects • Touchy & aggressive w/ others • Messy, disorganized work/desk/backpack • Avoids tasks 	<ul style="list-style-type: none"> • Passive, quiet, unengaged • Unaware of people & surroundings • Isolated from peers • “Daydreamer” • Low motor skills, endurance, & strength • Easily overlooked • Avoids tasks 	<ul style="list-style-type: none"> • Dislikes loud noises/environments • Dislikes physical touch/texture • Visually distracted easily • Walks on toes, chews objects • Emotionally reactive, anxious, stressed, irritable • Throws, hits, pushes, elopes • Avoids tasks

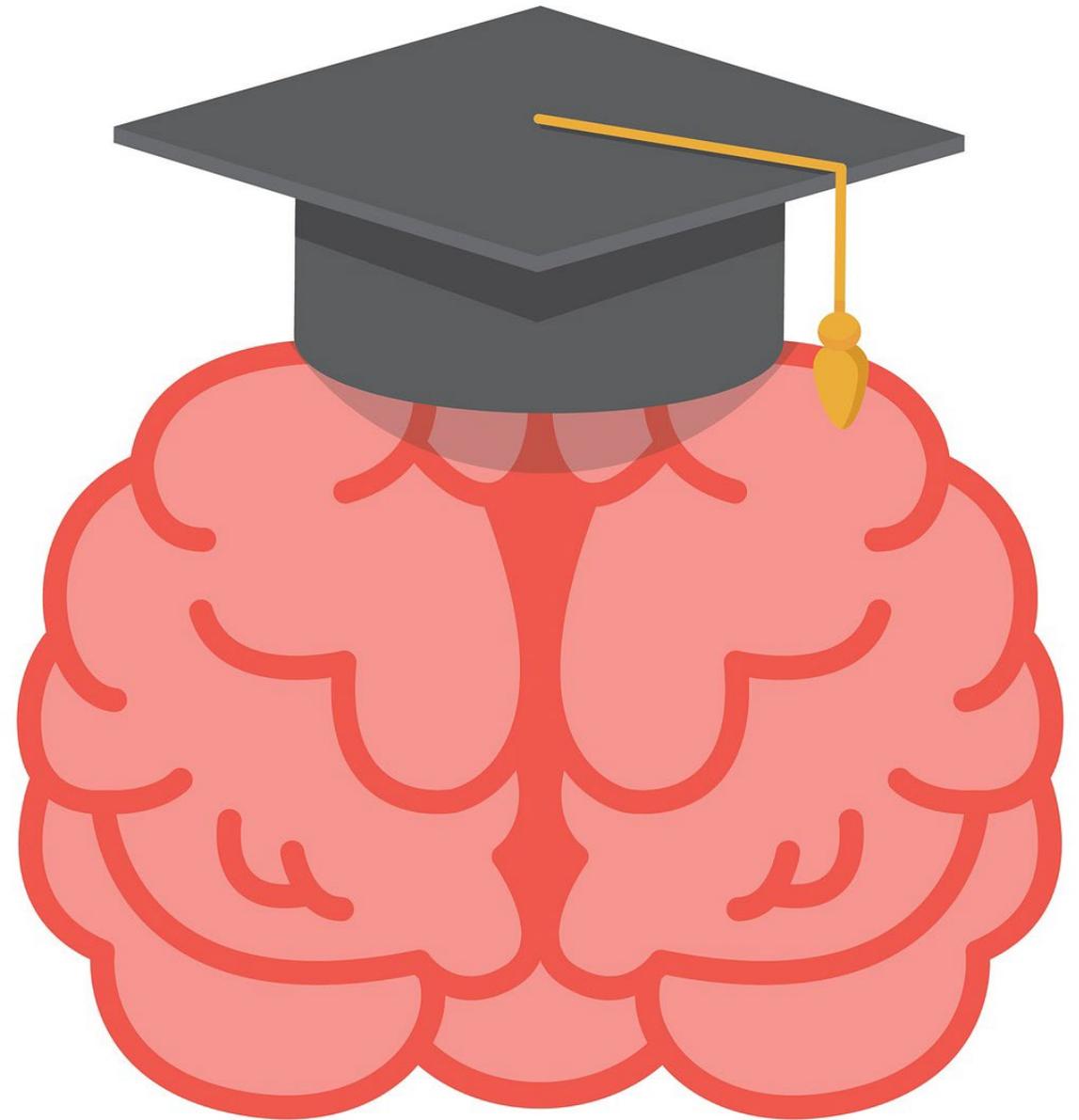
BE INTENTIONAL

BE INTENTIONAL

Design your learning environment through *informed, purposeful choices*

Incorporate sensory supports and accommodations into your instruction for a *reason*.

Sensory Friendly Classroom Design and Instruction is your guide in achieving intentional design!



Seating Types & Arrangements

Environment

CLASSROOM DESIGN

Color Scheme

Décor

Physical Arrangement &
Organization

COLOR SCHEME

- Colors of classroom effect children internally
- Blues & Greens give off shorter wavelengths- known as calming colors
- Bright colors spark internal chaos in children with SPD
- Stimulates feeling of calmness in ALL students



DÉCOR



- Mindful of overstimulation & purposeful
- “Visual noise” interrupts students to process information through other sensory systems (i.e. verbal directions)
- Allow for space between posters/bulletin boards
- Keep wall behind main instruction area relatively undecorated

Milo-Shussman, Y. (2017). "A little bit of this and not too much of that...": Is there a recipe for class display load level in elementary schools? *Journal of Learning Spaces*; Hanley, M., Khairat, M., Taylor, K., Wilson, R., Cole-Fletcher, R., & Riby, D. M. (2017). Classroom displays--attraction or distraction? evidence of impact on attention and learning from children with and without autism. *Developmental Psychology*

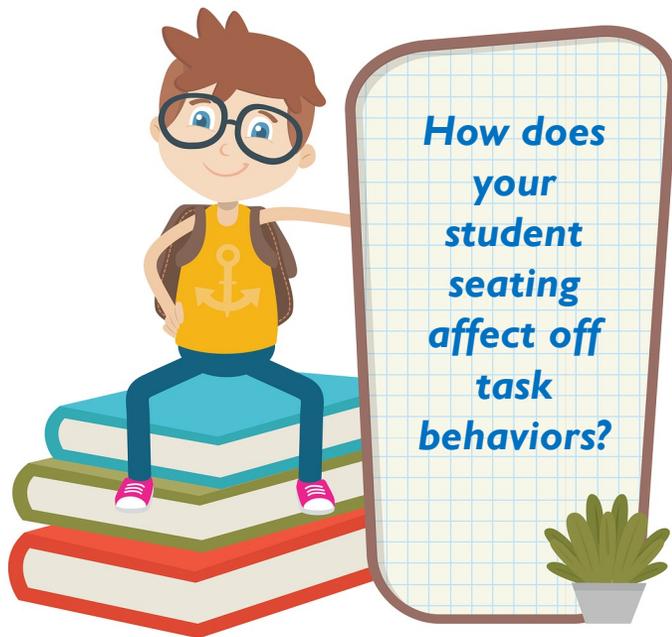
PHYSICAL ARRANGEMENT & ORGANIZATION

- Easy flow for students to move throughout room
- Thoughtful transitions
- Separate common areas
- Storage!
- Bookshelf covers
- Sensory Space for self regulation



Hill, L., Trusler, K., Furniss, F., & Lancioni, G. (2012). Effects of Multisensory Environments on Stereotyped Behaviours Assessed as Maintained by Automatic Reinforcement. *Journal of Applied Research in Intellectual Disabilities*

SEATING TYPES & ARRANGEMENT

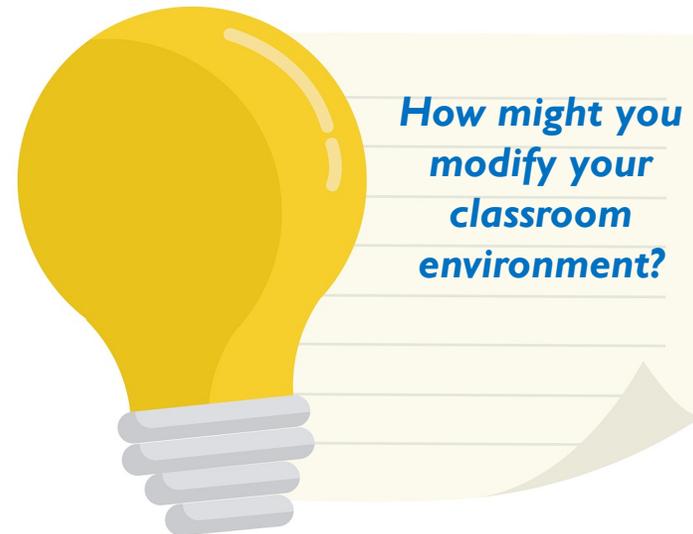


- Flexible seating is a MUST
- Seating arrangements directly impact off-task behaviors
- Change seating arrangements according to tasks required in lessons
- Mindful of seating placement of students with SPD

Riffel Ph.D, L.A. (2014). *Working with Learners Who Struggle in the Classroom: Interventions for ADHD, Learning Disabilities, Autism, and Oppositional or Non-compliant Behavior*; Simmons, K., Carpenter, L., Crenshaw, S., & Hinton, V. M. (2015). Exploration of classroom seating arrangement and student behavior in a second grade classroom. *Georgia Educational Researcher*,

ENVIRONMENT

- Minimize harshness of fluorescent lighting (light filters, floor lamps, etc.)
- Calming background music/white noise
- Increase natural light (windows, work outside, etc.)
- Consistent routines, visual schedules
- Classroom community



Howe, M., Brittain, L.A., & McCathren, R. (2004). Meeting the sensory needs of young children in classrooms. *Young Exceptional Children*; Morcom, V. E., & MacCallum, J. A. (2012). Getting personal about values: Scaffolding student participation towards an inclusive classroom community. *International Journal of Inclusive Education*; Vandewalle, G., Maquet, P., & Dijk, D. J. (2009). Light as a modulator of cognitive brain function. *Trends in Cognitive Sciences*

General Supports

Sensory Seeking SPD

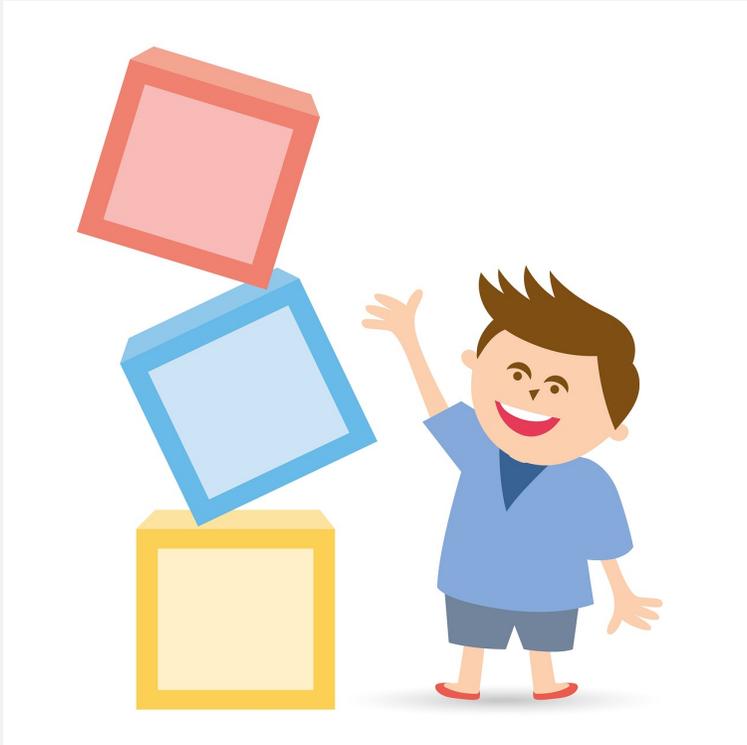
INSTRUCTIONAL STRATEGIES

Under Responsive SPD

Over Responsive SPD

Sensory Breaks

GENERAL SUPPORTS



- Movement opportunities BEFORE work = organize body, level of arousal, attention for function
- Secret hand signals/code words between teacher & student
- Teach new & appropriate coping strategies! Use rewards & incentives

SENSORY SEEKING SPD

*Sensory Seeking students require intense sensory input to meet threshold

READING	WRITING	MATH
<ul style="list-style-type: none"> - Act out story - Read in other areas around room - Read in desired position (flexible seating) - Listen to story on headphones - Reading tracker/window - Chew gum - Turn classroom lights off and read with a flashlight - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Act out writing - Write in other areas around room - Write in desired position (flexible seating) - Finger write letters/words in trays of sand/salt/shaving cream - Use colored pens/markers - Use pencil grips - Write with sandpaper underneath writing surface - Write on incline board/easel - Write with vibrating/ weighted pencil - Use scented markers - Use chewable pencil toppers - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Place flashcards on ground to jump/stomp on them and answer - Write numbers/equations in trays of sand/salt/shaving cream - Make numbers using play-dough - Use varying manipulatives - Songs with gestures - Play classical music/white noise in background

UNDER RESPONSIVE SPD

*Under Responsive students require sensory input integrated into tasks to be engaged.

READING	WRITING	MATH
<ul style="list-style-type: none"> - Act out story - Read in other areas around room - Read in desired position (flexible seating) - Listen to story on headphones - Reading tracker/window - Chew gum - Turn classroom lights off and read with a flashlight - Read in different voices: robot, whisper, nasal, low tone, high tone, etc. - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Act out writing - Write in other areas around room - Write in desired position (flexible seating) - Finger write letters/words in trays of sand/salt/shaving cream - Use colored pens/markers - Use pencil grips - Write with sandpaper underneath writing surface - Write on incline board/easel - Write with vibrating/ weighted pencil - Use scented markers - Use chewable pencil toppers - Write on raised lined paper - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Place flashcards on ground to jump/stomp on them and answer - Write numbers/equations in trays of sand/salt/shaving cream - Make numbers using play-dough - Use varying manipulatives - Songs with gestures - Practice math facts/counting while rhythmic jumping on trampoline - Play classical music/white noise in background

OVER RESPONSIVE SPD

*Over Responsive students benefit from environmental modifications to avoid overstimulation.

READING	WRITING	MATH
<ul style="list-style-type: none"> - Read in other areas around room - Read in desired position (flexible seating) - Cover pages with paper, uncover line by line - Reading tracker/window - Use colored overlays on bright white paper - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones/earplugs - Read “big books” (added weight) - Chew gum - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Write in other areas around room - Write in desired position (flexible seating) - Utilize color coding - Reduced amount of handwriting - Velcro words onto laminated sheets - Use speech-to-text - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones - Provide written directions in small steps - Play classical music/white noise in background 	<ul style="list-style-type: none"> - Work in other areas around room - Work in desired position (flexible seating) - Cover page with paper, uncover 1 problem at a time - Use colored overlays on bright white paper - Velcro numbers onto laminated activity - Set up privacy folder to block out visual distractions - Wear noise cancelling headphones - Provide written directions in small steps - Play classical music/white noise in background

SENSORY BREAKS

- 10 min movement breaks increase engagement & on-task behaviors
- Provides proprioceptive & vestibular input
- Naturally incorporate movement through intentionally assigned “classroom jobs”
- Fidgets increase retention by up to **37%** in the classroom!
- Fidget tools help drown out distracting/unnecessary sensory information



Howie, E. K., Beets, M.W., & Pate, R. R. (2014). Acute classroom exercise breaks improve on-task behaviors in 4th and 5th grade students: A dose-response. *Mental Health and Physical Activity*; Riffel Ph.D, L.A. (2014). *Working with Learners Who Struggle in the Classroom: Interventions for ADHD, Learning Disabilities, Autism, and Oppositional or Non-compliant Behavior*

SENSORY BREAKS

	Heavy Work Activities	Movement	Deep Pressure
Break Ideas	<ul style="list-style-type: none"> - Carry heavy bag/box - Wall pushups 	<ul style="list-style-type: none"> - GoNoodle - Yoga - Songs w/ gestures (Hokey Pokey; Head, Shoulders, Knees, & Toes; Simon Says) - Animal Walks - Jumping Jacks - Trampoline jumps (rhythmic) 	<ul style="list-style-type: none"> - Weighted Lap Pads - Weighted Vests - Weighted Blankets
Classroom Jobs	<ul style="list-style-type: none"> - Chair Stacker - Librarian (return books) - Board eraser - Door holder 	<ul style="list-style-type: none"> - Messenger - Mailman - Materials Manager - Office Runner - Paper Passer/Collector 	What can you think of?

CONSIDERATIONS

CONSIDERATIONS

Base modifications on needs of your students! (Learn behaviors and triggers)

Have open and honest conversations w/ students & families to find best strategies

Collaborate with OT and Education Specialist(s)

Establish expectations for use of sensory tools/environments with **WHOLE** class



THANK YOU!



- Your sensory friendly classroom is going to change the lives and learning of so many students!
- Thank you for putting the time and effort in to support the inclusion of ALL children!