Measuring Awareness of SPD and Interprofessional Collaboration and Practices Among Professionals in an Elementary Public School Setting

Kyra Resende

Follow this and additional works at: https://scholarworks.uark.edu/rhrcuht

Part of the Communication Sciences and Disorders Commons, Disability and Equity in Education Commons, Elementary Education Commons, Other Education Commons, and the Other Mental and Social Health Commons

Citation

This Thesis is brought to you for free and open access by the Rehabilitation, Human Resources and Communication Disorders at ScholarWorks@UARK. It has been accepted for inclusion in Rehabilitation, Human Resources and Communication Disorders Undergraduate Honors Theses by an authorized administrator of ScholarWorks@UARK. For more information, please contact scholar@uark.edu.
Measuring Awareness of SPD and Interprofessional Collaboration and Practices Among Professionals in an Elementary Public School Setting

An Honors Thesis submitted in partial fulfillment of other requirements for Honors Studies in Communication Sciences and Disorders

Kyra Sampaio Resende
COEHP Honors Thesis, CDIS Program
University of Arkansas
May, 2023
Abstract

Sensory Processing Disorder (SPD) is a neurological condition in which the brain has trouble receiving and responding to sensory information, which can lead to sensory dysregulation (Rodden, 2023). Because everyone constantly receives sensory input, having SPD can impact a child’s life in numerous ways, such as academic and social success. Research indicates that 5% to 16% of students may have this neurological condition (Bunim, 2013), which is significant enough to expect that school professionals have appropriate awareness about SPD. Additionally, there is usually an overlap of professionals who serve students experiencing SPD, resulting in a need for interprofessional collaboration (IPC) among the school support team. This study aims to answer: What is the level of awareness of SPD among professionals in elementary school settings in Arkansas? and To what degree do professionals use interprofessional collaboration (IPC) while working with a child who experiences SPD in an elementary school setting? This study included two facets: (1) a survey to measure the awareness of SPD and degree of IPC, and (2) observations in an elementary public school. A survey titled Measuring Awareness of SPD in an Elementary School Setting was sent to Arkansas educational cooperatives for distribution to professionals who work in elementary schools. There were 44 questions, with most on a Likert-based scale. The researcher also observed an occupational therapist (OT) for six weeks. A total of ten students were observed. Of the participants, 25% have taken college coursework addressing SPD. Additionally, 42.6% have attended professional training specifically addressing SPD. Data show 35.4% agree or strongly agree in feeling confident about their ability to recognize behaviors that may indicate SPD. There were 57.4% indicating they agree or strongly agree about familiarity with SPD. Also, 66.7% strongly agree or agree that they are familiar with interprofessional collaboration and 41.6% have received training.
Measuring Awareness of Sensory Processing Disorder and Interprofessional Collaboration Practices Among Professionals in an Elementary School Setting

Erika Springer-Quade, Honors Communication Sciences and Disorders, Angelo Eliles, Ed.D., Rachael Glode, Ph.D., CSC-SLP, LSLS Cert, AVT
University of Arkansas

INTRODUCTION

Sensory Processing Disorder (SPD) is a neurological condition in which the information that the brain receives from the senses is perceived in a way that can be challenging or confusing. Individuals with SPD may have difficulty processing sensory information, which can impact their performance in daily activities (Quade, 2018). This disorder may present in various ways, such as hyper- or hypo-sensitivity to sound, light, or touch. Early identification and intervention can be crucial to support individuals with SPD in their academic and personal lives (Kranzler, 2003).

Despite the prevalence of SPD, studies indicate that awareness among educators and other professionals remains limited. Only 31.4% of educators surveyed reported having received training on SPD, and even fewer had a degree or coursework specific to SPD (Quade, 2018). The goal of this research is to measure the awareness of SPD and interprofessional collaboration practices among professionals in an elementary school setting.

OBJECTIVE

The study aims to answer the following questions: What is the level of awareness of SPD among professionals in an elementary school setting? and What strategies do professionals use in interprofessional collaboration (IPC) while working with children who experience SPD in an elementary school setting?

RESEARCH DESIGN AND METHODOLOGY

This study is a descriptive survey. A survey was distributed to assess the awareness of SPD among professionals in elementary school settings and their degree of IPC and (2) obstacles in implementing IPC.

A survey was developed using Google Forms. The survey was designed to collect data on professionals’ awareness of SPD, their level of knowledge about SPD, and their experiences with interprofessional collaboration. The survey included questions on the respondents’ demographics, professional background, and their experiences with interprofessional collaboration.

RESULTS

The survey included several questions related to the awareness of SPD and interprofessional collaboration. Results indicated that while many professionals were aware of SPD, there was a need for more training and resources to support interprofessional practices.

SURVEY RESULTS

- 63% of professionals agreed or strongly agreed that they had received training in identification of SPD.
- 58% of professionals agreed or strongly agreed that they had received training in intervention strategies for SPD.
- 60% of professionals agreed or strongly agreed that they had received training in strategies to support students with SPD.

CONCLUSIONS

The study suggests a need for increased awareness and training among professionals in elementary schools in Arkansas. The results indicate that there is a need for more awareness on the importance of understanding SPD, strategies to support students, and behaviors that children with SPD may present in school settings. A focus should be placed on training and resources for professionals to support interprofessional practices.

REFERENCES


ACKNOWLEDGMENTS

This research was funded in part from AHD. The Student Undergraduate Research Fellowship (SURF) Program provided support for this project. The investigator would like to thank the teachers and students who participated in this study for their contribution. The investigator also thanks the support from the Arkansas Department of Education and the College of Education at the University of Arkansas.
Contents

Introduction

Purpose of Study.................................................................7
Background........................................................................7
Definition of Terms.............................................................8
Significance.......................................................................11
Summary.........................................................................12

Review of Relevant Literature

Developmental Milestones of Elementary School Students..........13
Sensory Processing Disorder (SPD), Sensory Integration (SI), and the Challenges Presented..........................................................15
Effects of Sensory Processing Disorder........................................17
SPD in a School Setting..........................................................19
Importance of Awareness for Educators.....................................21
Assessment and Evaluation......................................................24
Rationale for the Study..........................................................25
Leading Research................................................................28
SPD Interventions................................................................30
Classroom Strategies for Students with SPD...............................32
Self-regulation Strategies.........................................................33
The Relationship Between the Classroom Teacher, the Occupational Therapist, the Speech-Language Pathologist, and the Parent.........................34
Summary.........................................................................39
Methodology

Introduction ................................................................. 42
Confidentiality ............................................................. 42
Demographics of the Survey Participants ...................... 43
Description of District and School Demographics of Observation Setting .... 46
Data Collection Methods ................................................ 48
Table 1. Observation Schedule and Summary of Observations ........... 50
Post-data Analysis ......................................................... 54
Summary ................................................................. 55

Results

Archived Data and Pre-collection Data ......................... 56
Survey Data Analyses ..................................................... 57
Observations ............................................................ 60
Observations Takeaways ............................................... 71
Summary ................................................................. 72

Conclusions & Discussions

Introduction ................................................................. 73
Conclusion ............................................................... 73
Limitations .............................................................. 75
Implications .............................................................. 76
Recommendations ......................................................... 78
Summary ................................................................. 79

References ......................................................................... 81-87
Appendices

Appendix A.1………………………………………………………………………………88
Appendix A.2………………………………………………………………………………89-91
Appendix A.3………………………………………………………………………………92-94
Appendix A.4………………………………………………………………………………95
Appendix B………………………………………………………………………………96-100
Appendix C………………………………………………………………………………111-134
Appendix D………………………………………………………………………………135
Appendix E………………………………………………………………………………136
Chapter I

Introduction

Purpose of Study

The purpose of this study is to investigate the level of awareness of Sensory Processing Disorder (SPD) and Interprofessional Collaboration (IPC) among professionals in an elementary school setting. By surveying and observing professionals such as classroom teachers, Occupational Therapists (OTs), Speech Pathologists (SLPs), special education (SPED) teachers, and other educational specialists, the researcher will investigate how SPD impacts students in elementary schools, awareness of professionals working in the educational setting about SPD, what strategies, if any, are implemented in the school setting to support students with SPD, interventions that therapists use, and the degree of interprofessional collaboration among those supporting a student with SPD in a public school setting.

Background

Awareness of sensory processing disorder and sensory processing issues is imperative among professionals who work with school-aged children and adolescents. School is often the first place in which children engage in activities and face challenges within a large, structured social group outside of their home environment. Therefore, educators and other professionals working in schools are the most likely people to recognize the signs that a child might experience SPD and refer the child to the appropriate professionals for support.

The exact number of school-aged children with SPD is undetermined. However, children with SPD can range from 5% to 16% of all school-aged children (Bunim, 2013). With such a significant number of students who have this disorder, it is sensible to presume that professionals
who work at schools have appropriate awareness about SPD, know how to identify the possible signs, and are able to refer the child for support services.

Unfortunately, because SPD is not considered a learning disorder and an official diagnosis for SPD is usually not given, professionals and educators in schools often do not have the training they need to identify this disorder (Child Mind Institute, n.d.) and are not aware of appropriate strategies to help a student. For example, 87% of the Head Start program staff is familiar with SPD; however, only 17% provided an accurate definition of how this disorder can cause challenges for children in a school environment (Alibrandi et al., 2014). Without proper training, SPD often goes unidentified and the child can be considered as simply exhibiting inappropriate classroom behavior (Wilmot, 2020), when the problem is actually much different.

Definition of Terms

The following are defined in order to facilitate the understanding of this proposed study:

1. Sensory Processing Disorder (SPD)
   a. SPD is a complex neurological condition in which the brain has trouble receiving and responding to sensory information (Rodden, 2023).
   b. Occupational therapist and neuroscientist Jean Ayres compares SPD to a neurological traffic jam. Meaning that certain parts of the brain do not receive information to properly interpret the senses or the brain does receive sensory information until after a situation has occurred (National Science Teaching Association, n.d.).

2. Sensory Integration (SI)
   a. SI is the brain’s ability to process information (sound, taste, smell, and other senses), put this information together with previous experiences, and produce a
response called sensory integration. This is an unconscious process that gives meaning to what is happening around the person and allows people to respond purposefully to the occurrences around them (Ayres, 1972).

3. Occupational therapist (OT)
   a. “Occupational therapists are health care professionals who help people to resume or maintain participation in a variety of tasks – their jobs, leisure and social activities, getting around, caring for themselves and their home, and much more” (College of Occupational Therapists of Ontario, n.d., p.1). Some responsibilities of OT’s are: helping children develop handwriting skills, providing behavior management strategies, self-care skills, transitioning skills, and work skills (AOTA, 2017).

4. Structured Service Learning Classroom (SLS classroom)
   a. The SLS classroom is a heavily structured classroom that provides students with a safe environment. Students in this service have a set and predictable schedule. They also have their schedule posted on a classroom wall so they can visualize it along the day and understand a consistent routine. Students do not spend the entirety of the day in this classroom, they also go to the general education classrooms for inclusion within content courses.

5. Sensory Room.
   a. In this room there is equipment that provides students with sensory input that is in alignment with their sensory needs. For example, there is a squeeze machine a student can go through if he/she requires a deep pressure sensation. There is also a dark den students can lay inside of so that they are in a calm and dark
environment for a few minutes. Other examples of equipment are crash pads and toys such as kinetic sand.

6. Interprofessional Collaboration (IPC)
   a. To collaborate is to work together to reach a common objective that all collaborators have. IPC means professionals from different professions working together in the intervention of a patient to reach common goals.

7. Interprofessional Practices (IPP)
   a. IPP, similar to collaboration, means that health workers from distinct backgrounds work together in their practices, as well as work with patients and families to provide better healthcare (Queensland Health, 2019)

8. Piaget’s Theory of Cognitive Development
   a. This theory suggests that children have to construct mental models of the world to develop cognitively and acquire knowledge (McLeod, 2022).
   b. There are four stages of cognitive development:
      i. Sensorimotor stage (birth to 2 years)
      ii. Preoperational stage (2 to 7 years)
      iii. Concrete operational stage (7 to 11 years)
      iv. Formal operational stage (12 and up)
   c. According to Piaget, all children go through these stages in the same order as each stage builds on the other. However, some children can go through these stages at a different rate (McLeod, 2022).

9. Sensory Systems
a. “The total structure involved in sensation, including the sense organs and their receptors, afferent sensory neurons, and sensory areas in the cerebral cortex at which these tracts terminate. There are separate systems for each of the senses” (American Psychology Association Dictionary, n.d.)
b. The eight sensory systems are: visual, auditory, tactile, olfactory, gustatory, vestibular, proprioception, and interoception (Children’s Home Society CHS, 2018).

10. Attention-Deficit Hyperactive Disorder (ADHD) and Attention Deficit Disorder (ADD)
a. Persistent presence of symptoms like inattention, impulsivity, and hyperactivity. These symptoms can impair social, academic, and occupational functioning (American Psychology Association Dictionary).

11. Autism Spectrum Disorder (ASD)
a. Group of disorders with typical onset during one’s preschool years and characterized by difficulties in communication and social interaction (APA Dictionary of Psychology, 2023).

Significance

The following research questions will be addressed:

1. What is the level of awareness of SPD among professionals in elementary school settings in Arkansas?"

2. "To what degree do professionals use interprofessional collaboration (IPC) while working with a child who experiences SPD in an elementary school setting?"
Summary

This study is separated into five sections: Chapter I gives a brief overview of the purpose and the background of the challenges of SPD that inspired the study. Chapter II gives a review of the relevant literature related to the developmental milestones of elementary school students; definition of SPD; challenges for students in an elementary school setting; academic and behavioral effects of SPD; research that supports success for students with SPD in a school setting; the importance of awareness for educators; assessment, evaluation and interventions for SPD; rationale for the study; leading research; classroom strategies for students with SPD; and the relationship between the classroom teacher, school professionals (OT, SLP, PT, counselor) and the parent/caregiver. Chapter III discusses the study’s methodology, including the setting, participants, data collection procedures, instruments, and analysis of data. Chapter IV describes the data collected, how it was analyzed, and the conclusions drawn from both the survey and the researcher’s observations. Last, Chapter V is a summary of the research study as a whole. This section (Chapter I) has given a brief overview of the project, specifically the background on the level of SPD awareness.
Chapter II

Review of Relevant Literature

Developmental Milestones of Elementary School Students

**Cognitive development.** Elementary school students usually range from five to eleven years of age. Until the child is about seven years of age, he/she is still in the preoperational stage of Piaget’s cognitive development. From seven to eleven years of age, the child will be in the concrete operational stage. In short, elementary school aged children are finalizing the preoperational stage and entering the concrete operational stage of Piaget’s theory. Knowing which stage a child is in Piaget’s cognitive development theory is important to understand which stage of intellectual development the child may be functioning in during this time. This allows parents, teachers, therapists, and professionals to establish what should and should not be expected of children in a particular age.

In the preoperational thinking stage (2 to 7 years), a child has not extensively developed logical thinking and he/she cannot combine or separate ideas (Simply Psychology, 2018). The key features of this stage are:

- **Centration:** child can only focuses on one aspect of a situation
- **Egocentrism:** child cannot see a situation from another person’s point of view
- **Play:** in the beginning of this stage the child mostly engages in parallel play and by the end of it the child has started to engage in play, especially pretend play, with other children
- **Symbolic representation:** a child begins to develop the ability to make one thing stand for something else (for example, the word chair symbolizes the actual object that is a chair).
In the concrete operational stage (7 to 11 years), the child has begun to develop organized and rational thinking. The child can now apply logical thinking, but only to physical objects, meaning that the child has yet to develop abstract thinking (Simply Psychology, 2021). Key features include:

- Conservation: understanding that quantity stays the same, even if the appearance changes
- Classification: ability to classify objects based on the common traits of an object

**Sensory and social skills development.** Apart from cognitive development, children also continuously develop their sensory and social skills. The Children’s Hospital at Richmond (n.d.) has published a list of sensory/social skills for children 2 to 12 years of age. Because this study is based on the chronological age of elementary school-age children, the skills for children six to twelve years are outlined:

- Six to eight years of age: In this age range, a child with typically developing social and sensory skills is able to share materials ‘s and participate in group activities, as well as being able to handle certain group situations (standing in line, for example), without becoming aggressive due to the lack of personal space. The child not only is able to handle group situations, but also usually enjoys group activities and playing. Furthermore, a child in this age range is able to sit still without having to fidget and stand up most of the time, can transition well between activities without major commotion, is able to function well in noisy environments, and has similar levels of intelligence and motor skills to other children his/her age.

- Nine to twelve years of age: According to the Children’s Hospital at Richmond, a child with typically developing social and sensory skills starts to see himself/herself as an
individual, and also intentionally spends time and energy on the relationships he/she has with his/her peers.

**Sensory Processing Disorder (SPD), Sensory Integration (SI), and the Challenges Presented**

SPD is a complex neurological condition in which the brain has trouble receiving and responding to information pertaining to the senses (STARInstitute, n.d.). Scientists do not know the etiology of SPD; however, researchers have conducted brain scans of children who have SPD without a diagnosis of Autism Spectrum Disorder (ASD) or other disorder, and identified differences in white matter (Bunim, 2013). This difference in white matter was primarily located in the back of the brain, where the auditory, visual, and tactile senses are processed. These findings indicate that SPD could be a neurological disorder on its own, though more research still needs to be conducted. The incidence of SPD in individuals diagnosed with autism or Attention Deficit Hyperactivity Disorder (ADHD) is over one in twenty (Wilmot, 2020), hinting at a correlation between SPD and disorders like autism and ADHD.

SPD means that a person has difficulty controlling and coordinating the sensory input that he/she is receiving from the environment (Wilmot, 2020, p.9). Occupational therapist and neuroscientist Jean Ayres compares SPD to a “rush hour traffic jam” (Ayres, 1970, p.5) in the brain. Meaning that certain parts of the brain do not receive information to properly interpret senses or the brain only receives sensory information until after a situation has occurred (National Science Teaching Association, n.d.)

Humans, in general, have eight different sensory systems: visual, auditory, tactile, olfactory, gustatory, vestibular, proprioception, and interoception, which are the sense of vision, sense of hearing, sense of touch, sense of smell, sense of taste, sense of balance, sense of body awareness, and sense of the internal state of the body retrospectively (Children’s Home Society
CHS, 2018). Though visual, auditory, tactile, olfactory, and gustatory tend to be the more commonly known senses, each of these systems are imperative for people to perceive the world.

In order to perceive the environment, the brain needs to integrate sensory information, so it can process and put information from the senses together to create meaning out of what is going on. Jean Ayres developed the theory of sensory integration (SI), which is the brain’s ability to process information (sound, taste, smell, etc), put this information together with previous experiences, and produce a response called sensory integration. SI is an unconscious process that gives meaning to what is happening around the person and allows people to respond purposefully to the occurrences around them (Ayres, 1972). For children who have SPD, the brain loses its ability to integrate the senses, so information becomes disorganized while being processed (DeMichael, 2016).

There is an enormous debate over SPD (Arky, n.d.). A primary reason why SPD tends to be unheard of and why there is so much debate over it is because this disorder is not included in the Diagnostic and Statistical Manual (DSM-5, 2013), which is used by psychiatrists, psychologists, and social workers when making their diagnosis (Arky, n.d.). It is also not mentioned in the DSM-5’s text reviewed version (DSM-5-TR, 2022). The authors for the DSM-5 claim that it is still not clear whether children who have sensory-based problems actually have a disorder in the sensory pathways or if these problems are associated with other environmental and behavioral factors (Neale, 2012). Also, Occupational Therapists (OTs) tend to be the ones most aware of this disorder, because OTs are the ones who first theorized that sensory processing issues are the reason for distress in a child, which causes him/her to present “inappropriate behaviors” (Arky, n.d.). However, among this debate, there is a common agreement between
professionals that children with disorders like ASD and ADHD do have unusual sensory responses.

Because there still is so much disagreement about SPD, there is not a wide awareness about this condition. Consequently, a child might end up without receiving the necessary treatment, as no one around him/her is aware of the disorder, its symptoms, the challenges that arise, and how to support someone who has SPD. Professionals in schools might label the student as difficult, the troublemaker, or the one with behavioral challenges, instead of recognizing the neurological condition of SPD.

The behaviors presented by children who have SPD can be difficult without a doubt. It is important, however, to keep in mind that the causes of a child’s “misbehavior” are out of his/her control. Therefore, it is imperative to raise awareness on how to identify and support a student who may have SPD, especially in the school setting.

**Effects of Sensory Processing Disorder**

Sensory intolerance is quite normal. Everyone has some sort of sensory input that bothers or annoys them. For example, some people cannot stand the sound of electronic music while others become overwhelmed if they have to multitask. It becomes a problem when every sensory input interrupts daily functioning (DeMichael, 2016). SPD is distinct to each child who has it, and their behaviors and symptoms will differ. Though each child is unique, there are some common behaviors that individuals with SPD might present (Biel, 2005, p 15-18):

- Hypersensitivity or hyposensitivity
  - Craving or avoiding touch, sights, sounds, movement, tastes, smells, etc.
- High distractibility
- Tuning-out or withdrawing
● Intense reaction to situations along with impulsiveness
  ○ Suddenly starts crying, banging their body or head against a wall.
● Difficulty with transitions
  ○ Going from free play to cleanup, for example.
● Not wanting to participate in group activities
● Tantrums last longer and are more intense because emotions can be difficult to process
● Socio-emotional difficulties
● Developmental and learning delays
● Awkwardness and insecurity
● Having difficulty going from an alert state to a calm state

In her book, Keriann Wilmot (2020) also discusses similar behaviors that a child with SPD might present:

● Movement seeking.
  ○ Running, jumping, spinning, climbing.
● Non-typical response to pain.
  ○ Overreaction or not reacting at all.
● Eat nonfood items.
● Difficulty starting and finishing projects (impulsivity).
● Express frustration by pushing, hitting, biting, kicking, screaming, and other violent behaviors.
● Picky eaters.
● Delayed fine-motor skills.
For a child with SPD, “the world seems like an unpredictable, frustrating, even dangerous place” (Biel, 2005, p. 16). Unfortunately, people expect a child with SPD to go about his/her day as if nothing is frustrating or overwhelming them and behave in a typical manner.

**SPD in a School Setting**

Due to the effects of SPD discussed above, children who experience this challenge might have problems with completing day-to-day activities, and participating in social activities, and focusing on academic tasks, especially when in large groups. This happens because they feel dysregulated from the sensorial input they are receiving from their environment (Wilmot, 2020). A child, or even an adult, might not know how to respond to all the stimuli occurring around him/her. Therefore, he/she ends up acting in a way that is considered “inappropriate” (CHS, 2018).

These “inappropriate” behaviors can be referred to as sensory-seeking or sensory-avoidant behaviors (Steeley, 2018). Some examples of sensory-seeking behaviors are pushing (either him/herself or a friend), misusing materials (for example, eating play-doh), and inappropriate movement or touching. Similarly, some examples of sensory-avoidant behaviors are being irritated with noise or not being able to participate in various classroom activities (Steeley, 2018).

There are actual reasons why a student with SPD presents unsafe behaviors. The student’s behavior is his/her brain’s “fight or flight” response to his/her frustration and overwhelming sensations (Wilmot, 2020). Meaning that these behaviors are the brain’s survival response to a stressful situation that seems threatening. During a fight or flight response, a person’s heart rate increases, the person becomes tense, pupils dilate, and stress hormones are released (Cleveland Clinic, 2019). A child with SPD already has a hard time processing his/her environment;
however, having to process the feelings that come from fight-or-flight mode can become stressful to handle and to respond in a typical manner. Still, everyone deals with some form of sensory overload at some point so a child only presenting these behaviors a few times should not raise flags for the possibility of SPD (Wilmot, 2020).

The behaviors of a student who does have SPD will frequently put personal safety and even the safety of those around him/her at risk due to his/her inability to self-regulate and attain a calm state. This type of behavior can become highly disruptive in a classroom setting and may lead to consequences, such as removal from the classroom, caregivers having to go pick up the child, and -- in more extreme cases -- expulsion, as the school professionals do not feel they can handle this type of behavior in the academic setting.

There is a lack of awareness about SPD among school professionals, as well as a lack of research, especially in an academic setting. The research that does exist addresses more the clinical aspect of SPD, rather than the impact this disorder may have in a classroom environment (Steeley, 2018). Fortunately, there are some studies that exist in which teachers are surveyed on their use of sensory integration methods to improve both behavioral and academic performance (Steeley, 2018). There is also an increasing understanding that school is the best setting to evaluate whether a sensory intervention may be successful (Worthen, 2010). It is also concluded that there is a positive impact in students, with and without developmental differences, when certain sensorial strategies are implemented in the classroom (Worthen, 2010). These strategies include use of auditory input (playing calming music, for example), devices to help with posture for improved attention, and tactile stimulation. Because of these findings, Worthen (2010) recommends that OTs in schools develop sensory interventions that teachers can use in the classrooms to improve success in behavioral and academic achievement.
There are also a number of studies that explore the impacts of teaching self-regulation strategies to students. Raver et al. (2011) found that self-regulation strategies help mediate classroom instruction and proposes that a curriculum that implements teaching strategies for self-regulation can positively impact social and academic performance. Teaching self-regulation strategies and executive skills are important for on-task behaviors (Boekaerts & Corno, 2005). When a student feels dysregulated, the brain’s priority shifts to well-being, rather than focusing on the task that the student has been assigned. The brain sends warning signals that there is something in the environment that is bothering the student:

[Intense] emotions tend to override goals and actions, even considerations of appropriateness or long-term consequences. These warning signals interrupt ongoing activities, making sure that the event that caused the interruption is evaluated and one’s coping potential is considered in relation to the potential threat to well-being (Boekaerts & Corno, 2005, p. 205).

In addition to research about the impact of teaching self-regulating skills, there is also growing research about the benefits of movement breaks, not only for students with SPD, but also for all students. Mulrine et al. (2008) states that movement is crucial for better learning and achievement as it stimulates the brain, increasing attention span, and improves behavior. Movement breaks can include stretching, walking, and other types of exercise (Jensen, 2000).

**Importance of Awareness for Educators**

Working with a student who exhibits the characteristics of SPD can, without a doubt, be overwhelming for a teacher. Having awareness about SPD and knowing how to identify this disorder allows professionals in a school setting to positively support the student in their daily school activities in a way that will be successful for the child, his/her classmates, and school
professionals. Furthermore, it allows the teacher, therapist, or other professionals working with the student to support the guardian/caregiver in their role to assist their child, in case specific interventions are needed (Kumpel, 2013).

School is a crucial environment for recognizing if a child has characteristics of SPD, as students spend numerous hours in school. It is imperative for a classroom teacher to have good observational skills and document patterns of behaviors and classroom challenges.. If a student is feeling dysregulated, the teacher should observe and record the child’s behaviors to look for patterns in order to better understand what may have triggered the dysregulation. This information is helpful for therapists during their evaluation and intervention process (Wilmot, 2020).

For a child with sensory difficulties, their struggle in school tends to become increasingly challenging with time, which leads to more intense meltdowns (Wilmot, 2020). If teachers are aware of the triggers of SPD and know how to support these students, they can possibly ensure that the behavior of children with SPD does not become more intense. To be aware of and knowledgeable about SPD means to understand that sensory issues can greatly affect a student academically. It also means to understand the school and/or classroom environment, the people in that environment, and the activities that the child is expected to participate in during the school day. This can also play a significant role in how the student reacts to and behaves during sensory overload or underload.

A teacher who is aware of SPD can create a calmer and safer environment for the students who have this disorder. Keriann Wilmot (2020) gives some examples of what this environment might look like in her book:

- Be aware of your body and your tone.
○ Get to the child’s level, do not overwhelm the student by speaking too many words while yelling.

○ Make sure you are not putting yourself in a position in which you can get injured.

● Be mindful of touch.

○ Touch can overwhelm a child while it calms others down. Be aware of whether touch affects the child in a positive or negative way.

● Environment stimulation.

○ During a meltdown, look for ways to reduce the student’s overload. If the classroom is being too loud, ask for the other students to speak quietly. If there is music playing, turn off the music.

● Create a safe and quiet place in the classroom (a cozy corner, for example).

○ When the child is having a meltdown, redirect him/her to this space where he/she can calm down. Do not associate this space with a time-out corner, because then the child will not feel safe in this space.

● Show empathy toward the student.

○ The child will communicate their frustration in various ways. He/she might scream or literally say that he/she is mad. When this occurs, respond with “I understand that you are upset because of…”

● Give the student time to process what happened.

● Understand what you can do to help.

○ Ask the child what makes him/her feel better and calmer. Find out his/her triggers.
Assessment and Evaluation

Parham and Mailloux (2010) identified five functional impairments that can be associated with SPD:

- Almost no social and occupational engagement
- Difficulty responding to environmental changes and challenges
- Lower self-esteem
- Under-developed functional skills
- Decreased fine, gross, and sensory-motor skills

As seen above, SPD can negatively impact the development of functional skills and behavioral abilities. Therefore, it is crucial that professionals identify this disorder as early as possible with the appropriate assessments. Assessing sensory processes include standardized tests, caregiver questionnaires, and formal observations. (Jorquera-Cabrera et al., 2017)

Teachers cannot diagnose SPD; yet, their input and relationship with the child is important during diagnosis and intervention. The person most likely to evaluate and treat a child with SPD is a pediatric occupational therapist (Wilmot, 2020).

To evaluate the student, OTs will mainly observe the child in structured activities and free play to see a student’s reactions and responses to the occurrences in the environment around them (Wilmot, 2020). Additionally, in the evaluation process, parents and teachers are asked to complete structured and standardized checklists that compare the child with other typical children in his/her age range which evaluate a child’s development. Teachers can further observe how the child interacts with peers, instructional materials, educational learning activities, and transitions during the school day.
Some popular evaluation checklists that occupational therapists give parents and teachers to complete are:

- The *Sensory Profile 2* by Winnie Dunn (2014)
  - Dr. Dunn, Distinguished Professor of the OT department at the University of Missouri, has several studies about sensory processing and success in everyday life. This checklist evaluates a child’s sensory processing patterns at home, school, and other social and learning activities. This standardized testing can be used with children from birth to 15 years of age.

- *Sensory Processing Measure (SPM)* by Diane Parham (2007)
  - This is an evaluation set that includes three rating forms that assess sensory processing, motor planning (praxis), and social participation. Assessment takes place at home, in the school setting, and community activities (similar to *The Sensory Profile 2*). This assessment is firmly grounded in Ayres’ SI theory.

Both of these checklists ask caregivers to rate the child’s behaviors and social actions. The possible responses are “always”, “frequently”, “occasionally”, or “never.” Upon completion, the OT compiles the scores, converts them into one standardized score, and compares it to a statistical “norm.” These assessments are starting points to determine appropriate treatment and are also helpful in measuring treatment progress (Wilmot, 2020).

**Rationale for the Study**

This section provides a rationale for the study supported by prominent organizations that align with adolescent development. The organizations include the American Psychological Association (APA), the American Speech-Language Hearing Association (ASHA), American
Occupational Therapy Association (AOTA), the Collaborative Leadership in Ayres Sensory Integration (CLASI0), and the National Science Teaching Association (NSTA).

**American psychological association (APA).** The APA has a definition in the organization’s dictionary for sensory integration dysfunction:

“a condition characterized by difficulties in organizing, processing, and analyzing sensory input (touch, movement, body awareness, sight, sound, smell, and taste). Also called sensory processing disorder. [first described by U.S. occupational therapist and psychologist A. Jean Ayres (1920–1989)]”

Along with their dictionary statement, Aneta Borkowska wrote an article about SPD and its diagnostic and therapeutic controversies for the APA PsycNet. Although there has been an increase in the diagnosis of sensory integration disorders, as well as in the use of SI therapy, there is still a lack of quality research and publications focused on this topic (Borkowska, 2017). In her article, the researcher aims to showcase the knowledge level and research in several areas relating to SPD, such as symptoms and diagnosis, neural bases of the disorder, and effectiveness of SI therapy.

**American speech-language hearing association (ASHA).** Jean Ayres hypothesized that Sensory Integration Dysfunction (SID) could lead to communication and learning disorders, which is in the scope of practice for Speech Language Pathologists (SLPs). Speech therapy is crucial for children who have SID (Abrahamseen, 2002). Sensory integration (SI) therapy during ST can be a helpful tool for any ST session, especially in sessions for children with SID or SPD. SI therapy has been prominently used by OTs throughout the past few years, but as collaboration between both fields has grown, SLPs are increasingly starting to use this therapy approach in their treatments as well (Abrahamseen, 2002).
American occupational therapy association (AOTA). AOTA has a fact sheet about SI in which they explain the importance of the senses, how they affect one’s daily lives, the challenges that a sensorial dysfunction can cause, and the importance of intervention. In the fact-sheet, they state that:

“Sensory integration and modulation disorders often lead people to have extreme over reactions to what others consider mild stimuli, or to completely shut down and disengage. Differences in interpretation of stimuli can impact motor skills and coordination, further limiting engagement and participation.” (AOTA, 2015, p. 1)

Collaborative leadership in Ayers sensory integration (CLASI). Ayres Sensory Integration (ASI) is an organization that trains and certifies researchers, practitioners, and educators on sensory integration using Jean Ayres’ theory. Jean Ayres developed the theory of sensory integration (SI), which is the brain’s ability to process information (sight, smell, hearing, taste, touch, vestibular sensations, proprioception, and interoception), compile this information with previous experiences, and produce a response called sensory integration. This is an unconscious process that gives meaning to what is happening in the environment around the person and allows people to respond purposefully to these occurrences (Ayres, 1972). The organization states that this framework of therapy was used for children with learning and behavior difficulties. Nowadays, it is an evidence-based practice used for children with autism. Professionals have begun to apply this framework to individuals with a variety of disabilities in a broad age group. The organization also states that SID is found in both people with no diagnoses of a disorder, as well as people with a specific diagnosis, such as SPD (CLASI, n.d.).

National Science Teaching Association (NSTA). NSTA is an organization for science teachers. In their article, Sensory Integration Challenges, NSTA (n.d.) has stated that problems
with sensory integration vary greatly. A student might have difficulty with only one sense or he/she might have difficulty with most of the senses. Whatever the case may be, it is important to make adjustments in the classroom to positively support the student. Some of these adjustments could be to reduce noise, dim lights (if possible), allow the student to sit where he/she would prefer, and others. The association states that the adjustments will depend on the degree of sensitivity, as well as the student’s developmental age. In the article, NSTA goes on to list ways to show support in the classroom through physical, visual, auditory, organizational, and sensory accommodations. Some teaching strategies that the article mentions are giving step-by-step direction, give direction in the child’s best learning modality (auditory, visual, reading/writing, or kinesthetic), give student verbal cues when it is almost time to transition, and give some suggestions or allow the student to brainstorm with a peer when the student is having difficulty coming up with ideas for assignments.

Leading Research

This research promotes Anne Jean Ayres’ study. Ayres has been cited numerous times for her imperative work in the occupational therapy field. She developed the theory of sensory integration (SI) along with a clinical approach for intervention of SI problems with children experiencing SPD. From the 1960s to the 1980s, Ayres published various research papers and books on sensory integration and also studied sensorimotor development and its effect on sensory input and motor responses (Jorquera-Cabrera et al., 2017). The book *Sensory Integration and the Child* (1972) is one of Ayres’ most influential and notable publishings, and is referenced as the leading research for sensory processing integration.

In her book, Ayres defines sensory integration as “the organization of sensations for use” (1970, p. 5). She contrasts sensations flowing into people’s brains as streams that flow into a
lake. Meaning that just like streams are constantly flowing into a lake, sensations are constantly flowing into the brain. Ayres explains that the typical brain organizes these sensations so a person can live in a productive manner. Ayres also makes another helpful analogy of the brain directing sensations, just as a traffic officer directs moving cars. She states that “when the flow of sensations is disorganized, life can be like a rush hour traffic jam” (Ayres, 1970, p. 5).

Ayres claims that, from the womb, a fetus begins to develop sensory integration. Playing is extremely important in the development of SI because the child’s brain is organizing a plethora of sensations (gravity, sound, sight, etc.). Ayres also states that everyone is born with the capacity of sensory integration, but a person needs to develop their SI through interactions with the environment. No one has perfect sensory integration, which organizes sensations perfectly. There are levels to how well the brain organizes sensations, some are exceptionally good and others are poor. Having poor sensory integration can often interfere with productive aspects in one’s life.

Children with sensory integration dysfunction can behave in a typical manner most of the time, while others with the same dysfunction will present medical, social, and/or educational challenges. This is one of the reasons why there is so little awareness about SPD. There is a wide range of behaviors that a child with SPD might present, and one child may present different behaviors than others. An important quote by Jean Ayres states, “Unless the problem is severe, sensory integrative dysfunction will often be overlooked by those who are not trained to recognize these problems” (1972, p. 3).

In the assessment portion of her book, Ayres declares that at the time she wrote, *Sensory Integration and the Child*, there was not a specific way to diagnose sensory integration dysfunction, as this disorder was not like most medical problems that can be measured in a
Diagnosis is done through observation, and the professional has to judge if the child’s brain is functioning according to observations compared to typical behaviors. A child’s family physician might not realize that he/she has SPD through typical medical procedures. Therefore, they claim that a child will eventually grow out of the problem. A therapist trained in sensory integration theory is the best professional to evaluate and diagnose a child who might have this disorder and experience challenges associated with sensory processing integration.

**SPD Interventions**

Children who develop SPD need intervention that will help them cope with sensory overload or “underload” and will help them further develop their sensory systems. Occupational therapists tend to be the professionals to carry out these interventions. These professionals have a broad list of approaches that they use to treat SPD.

**Sensory diet.** According to the Special School District of St. Louis County SSD (n.d.), a sensory diet is an individualized schedule of sensory activities that are specific to what a child might need to integrate into his/her daily activities, or to avoid causing challenges. Therefore, a group of activities is scheduled into a child’s daily routine to help increase the child’s “attention, arousal, and adaptive responses.” The input that the child receives from these activities releases neuro-chemicals that can last up to two hours. A sensory diet aims to maintain the flow of these neuro-chemicals in the brain throughout the day, so the child can feel calmer, which improves learning and functioning for productive social and behavioral success (SSD, n.d.)

Although only an OT or a Certified Occupational Therapist Assistant (COTA) can design a sensory diet, the plan should be carried out by others in the child’s day-to-day routine (SMILE Center, 2021). Every sense has several activities that will provide arousal. For example, if a child has issues with auditory processing and proprioception, then his/her sensory diet will focus
mainly on activities that will arouse these two senses. A specific focus on sensory integration or avoidance is planned for a child’s daily routine in regard to patterns that increase characteristics aligned with SPD.

**Sensory integration therapy (SIT).** The Child Mind Institute (n.d) states that the theory behind SIT are specific movement activities, resistive body work, and other sensorial activities (brushing the skin, for example), in which a child with sensory issues will experience optimal level of arousal or avoidance, thus helping him/her with regulation. SIT, like a sensory diet, is a sensory-based intervention; therefore, both treatments are similar to one another and provide strategies for the child to be successful in situations that align with sensory overload/underload.

The idea behind SIT is that the brain will eventually “rewire” and integrate sensory input appropriately. This “rewiring” of the brain does not actually mean that the brain will create new neural pathways or completely change. It means that SIT aims to decrease a child’s anxiety, thus he/she will become more confident, successful, and interactive in his/her daily life and in social situations (Arky, 2023).

**Ready bodies, learning minds.** This sensory approach is based on the idea that motor and sensory development are vital for academic achievement. Without a functional “reflexive-vestibular-proprioceptive-tactile system,” the student will not have a good base of body knowledge and develop the skills to build success in the school setting. This program enhances readiness to learn by giving the child movement activities that will help him/her develop reflex and sensory systems, which are necessary for academic performance (Steeley, 2018).

Providence Classical School, is one example of schools that base their curriculum on the idea behind Ready Bodies, Learning Minds. The school states that today’s generation of children
have increasingly poor posture, deprived vestibular systems (difficulty with balance and coordination), sensory overload, and a lack of core muscles (Adkins, n.d.). This happens because students must sit for extended periods of time while in school, which also causes muscles to weaken and leads to developmental delays. This idea is contingent with the principles of *Ready Bodies, Learning Minds*. The brain’s ability to develop and maintain neural connections depends on movement and play in younger children (Head Start ECLKC, 2022). Therefore, the idea behind *Ready Bodies, Learning Minds* is to implement movement breaks throughout the day to enhance learning.

**Important to note.** Sensory diets, along with other types of sensory-based (SB) interventions, such as SIT, are becoming increasingly popular for individuals with ASD and other sensory integration issues (Holehan & Zane, n.d.). It is important to note that there is still not enough empirical evidence to fully support this intervention, along with other SB therapies (Barton et al., 2015). Although there is substantial empirical literature about SB treatments and several professionals are pushing for their use, there is not enough evidence to fully support SB therapies, which means educational professionals should showcase treatment outcomes and strong experimental design in research (Barton et al, 2015).

**Classroom Strategies for Students with SPD**

For students with SPD, it is important that intervention is carried out in the classroom as well, and that the classroom teacher makes the appropriate accommodations for students with this disorder. There are considerable ways mentioned in research in which a teacher can implement strategies in his/her classroom to help a student with SPD.

**BrainWorks.** Teachers implement frequent “brain breaks” for students after a certain amount of time in an activity. During these breaks (30-90 seconds), students are encouraged to
move their whole body. There are also sensory breaks, which are similar to brain breaks but longer in duration, allowing for students to have greater opportunity for movement and sensory input. Activities can include yoga, exercises, dances, and movement songs to decrease or increase sensory input. (Wild & Steeley, 2018).

**Sensory equipment.** Along with movement breaks, there is also use of sensory equipment and furniture, which can be included as part of the classroom arrangement and physical space for a student to access upon need. Sensory equipment may include “FootFidget® Footrests, Kore Wobble Stools, noise-reduction headphones, fidget toys, weighted lap pads, and therapy balls for seating. Often, the OT researchers may also recommend dimming the lights, playing modulating music, and assigning seats.

**Self-regulation Strategies**

In her article, *Classroom Strategies for Sensory Processing Disorder*, Melissa Taylor (2015.), an elementary teacher and literacy trainer, shares strategies that a teacher can implement in his/her classroom.

- Allow fidget and chewing toys, and weighted materials for self-soothing.
- Exercise bands on the bottom of chairs to keep feet busy and close to the floor.
- Keep the classroom quiet if student with SD is over-responsive to noise
- Movement breaks
- Maintain a routine
  - When the routine is going to change, talk to the student about it so he/she is better prepared.

In her research study, Fitch (2020) outlines studies in which sensory-based interventions have been used by school professionals to treat students with disabilities. These studies were
implemented to determine if these methods could increase students’ time on task. A number of these methods turned out successful, while others did not make a positive impact. A sensory-based strategy that did have a positive impact and increased the time a child stayed on task was tactile stimulation. Tactile stimulation is any activity that involves touch and texture (play-doh or squeeze balls, for example) to increase sensory input. In this study, students were given an activity that gave them tactile stimulation while completing worksheets for math problems. This strategy seemed to decrease excessive motor movement and increase task completion (Kercood, Grskovic, Lee, and Emmert 2007).

**The Relationship Between the Classroom Teacher, the Occupational Therapist, the Speech-Language Pathologist, and the Parent**

**Interprofessional collaboration (IPC).** To collaborate is to work together toward a common goal. The World Health Organization (WHO) defines IPC as when several health workers from different fields work with the patients, families, carers, and each other for a higher quality treatment and healthcare overall (WHO, 2010). IPC is often used as a means of solving complex problems because there are professionals from several backgrounds bringing their knowledge to the table (Green, B. & Johnson, C. 2015). In health care, collaboration yields better services and outcomes for the general population, as it can lead to efficiency, mixing of skills, improved responsiveness, and better innovation and creativity (Green, B. & Johnson C., 2015).

**Interprofessional practice (IPP).** Similar to the definition of IPC, interprofessional practice happens when multiple health workers from different professional backgrounds work together with patients, families, careers, and communities to deliver the highest quality of care across settings (WHO, 2010). IPP can lead to an improved access to interventions, a coordinated and safe health system, efficient use of resources, reduced incidence and prevalence of disability,
and increased job satisfaction, along with reduced stress and burnout for professionals. Also, during IPP, the patient and/or the patient’s guardians (if the patient is underage) are involved in his/her treatment and are included as part of the therapy and strategies for the patient. An example of IPP would be a nurse, a neurologist, a physical therapist, and an occupational therapist collaborating to treat a patient who has become paraplegic. This may also include the collaboration with a classroom teacher, or school-based professional, in order to help a child obtain more success in academic and social-emotional experiences.

**Interprofessional education (IPE).** To achieve a collaborative-ready workforce, professionals need to receive IPE training. This is a crucial educational approach that teaches teamwork and collaboration for competency of professionals early on in their careers to gain success in their interventions (van Diggele, C., Roberts, C., Burgess, A. et al., 2020). The framework of IPE aims to teach collaborative practices and strategies that can transform and improve a patient’s treatment, and enhance the quality of work for the professionals involved with the patient (WHO, 2010). The basis of the framework for an educational outcome is that two or more students from different professions “learn about, from, and with each other to enable effective collaboration and improve health and educational outcomes” (WHO, 2010 p. 10). The core competencies for IPE are (van Diggele et al., 2020):

1. Roles and responsibilities
2. Ethical practice
3. Conflict resolution
4. Communication
5. Collaboration and teamwork
Interprofessional education and collaboration are imperative among healthcare professions, as it leads to professionals practicing efficiently and provides greater outcomes for patients. Bosch and Mansell (2015) list some of the benefits of IPC and IPP:

- Reduce, extra work, stress and burnout for the professionals
- Increase job satisfaction
- Improve patient outcomes
- Decrease mortality rates
- Optimize medication dosages

Universities usually create their own IPE programs. For example, the Rosalind Franklin University of Medicine and Science has designed a course called Interprofessional Healthcare Teams (HMTED 500). This is a required one-credit hour, pass/fail course for students in the university. In the course, all first year students are put into groups of 16 members to create interprofessional teams. Each team has at least one student that represents an area of healthcare. Each team has a faculty member, who has at least a master’s degree mentoring the team, to provide leadership for the interprofessional team (Bridges D. et al., 2011).

**Interprofessional collaboration (IPC) in a school setting.** As previously mentioned, collaboration means working together toward a common goal. The professionals working in a school all share similar goals: educating and supporting the growth and development of students, so they can prepare for the next stages of life. If the school professionals work together, they can achieve these common goals more effectively, efficiently, and smoothly, as each professional will complement the other’s ideas and perspectives. Just as IPC is helpful for healthcare workers in a clinical setting, this collaborative process can be crucial among professionals who work in a school to improve academic success and ability to develop social-emotional skills for students. If
a student needs an Individualized Educational Plan (IEP), for example, several professionals will be involved. From teachers, to special needs educators, to therapists, the ability to understand how to effectively practice IPC in situations such as this will be helpful to all professionals and students involved. Implementing interprofessional practices may save time, build relationships among school staff, and improve the outcomes for students (Kerins, M., 2018).

Though professionals acknowledge that IPE and IPP are prioritized within the medical field, most agree that it would be helpful among professionals in schools, and the impacts of IPE and IPP for school professionals currently remain largely unexplored (Wilson, McNeill, & Gilson, 2016. In their study, Wilson, McNeill, and Gilson (2016) surveyed teachers and SLPs in a school setting to measure their knowledge of IPE and IPP. They found that the SLPs and teachers surveyed received training in IPE with each other, as well as with other practitioners. The researchers also found that SLPs were more likely to report that they have learned about the similarities and differences of the roles of SLPs and classroom teachers and the benefits they have in a student’s life. SLPs reported learning about professional responsibilities and the working contexts of classroom teachers, and the benefits of learning about current approaches to literacy instruction. Meanwhile, teachers were less likely to report learning about the role of SLPs and their responsibilities in a school-based environment. Wilson, McNeill, and Gillon (2016) also found that educators largely reported that they tend to support SLPs mainly by giving advice and strategies on how to deal with a specific student and his/her behavior. This is already the beginning to the importance of interprofessional collaboration (IPC) in schools, as one of the benefits of interprofessional practices (IPP) which support effectiveness when professionals give advice to one another about students. Still, interprofessional education (IPE) remains largely
inconsistent in the educational setting, as implementing an IPE course can be a challenge and programs have different designs and goals (Bogossian, F. et al., 2023).

**Interprofessional collaboration (IPC) for sensory processing disorder treatment.** The treatment for SPD encompasses all areas of a student’s life. As mentioned in previous sections, intervention does not stay only in one environment, it often needs to be carried out in multiple domains of development, which include the home and the classroom. Providing IPE for teachers, SLPs, OTs, and other professionals who are supporting and/or treating a child with SPD-- or any other disorder-- would be beneficial for all involved, as the professionals would have knowledge on how to collaborate and communicate productively with one another. Furthermore, communication with the student’s caregiver would be more straightforward. With an IPP framework, professionals (classroom teachers OTs, STs, physical therapists (PTs), SPED teachers, etc.) can efficiently establish a support network for developing a student’s IEP and help the child achieve goals more easily, which leads to an improved academic life and social performance (ASHA, n.d.). ASHA (n.d.) cautions that teams who do not engage in IPP do not have smooth and consistent communication among each other. Thus, patients and their families end up caught in the middle of several professionals who do not know what the other is doing. This leads to treatment gaps, faulty diagnostics, less effective services, lack of progress and outcomes, and depending on the treatment setting, overbilling (ASHA, n.d.).

It is important to have consistency while treating any disorder. If the professionals in the student’s intervention team are not communicating with one another and are not apprised of what the other is doing to treat the individual, the professionals will not be able to provide the most effective intervention to a student who has SPD. For example, when there is collaboration and effective communication, the SLP can integrate what the student is learning academically into
therapy sessions, the OT can align with physical therapy services, and the SPED teacher can support and integrate these practices with speech therapy, and other school-based therapies and services. With this, any of these professionals would be able to integrate services, and address questions and challenges that the caregiver is facing in the home environment to ensure the child is progressing. This approach aligns with the whole-child developmental approach that is a current best-practice in education.

**Summary**

SPD is a complex, neurological condition in which the brain has trouble receiving and responding to information pertaining to the senses (STARInstitute, n.d.). The STAR Institute has also reported that one in twenty people may be affected by sensory processing disorder. Scientists still do not know exactly what causes SPD, though there are studies that give some insight into possible etiologies. Occupational therapist and neuroscientist Jean Ayres, a leading researcher in the SPD field, compares SPD to a “rush hour traffic jam” (Ayres, 1970, p. 5) in the brain. This means that certain parts of the brain do not receive information to properly interpret the senses or the brain only receives sensory information until after a situation has occurred (National Science Teaching Association, n.d.). There is an enormous debate about SPD, mainly because it is not included in the DSM-5, nor in the DSM-5-TR (Arky, n.d.). Because there is such a disagreement when it comes to SPD, there is not widespread awareness about this disorder. Therefore, educators in school setting might label a student as difficult, the troublemaker, or one with behavioral challenges, when in fact, he/she has a disorder that needs specific intervention.

SPD is unique to each child, but there are some common behaviors that are aligned with the disorder, such as hypersensitivity or hyposensitivity, high distractibility, difficulty
transitioning, long and elevated tantrums, developmental delays, among others. The behaviors presented by children who have SPD can undoubtedly be difficult, yet it is crucial to keep in mind that these so-called “misbehaviors” are out of the child’s neurological control, as he/she needs intervention to learn self-regulation strategies. Due to this challenge, it is imperative to raise awareness on how to identify and support a student who might display characteristics of SPD, in order to provide the help he/she needs to be successful academically and socio-emotionally.

School is a crucial environment for recognizing if a child presents with characteristics of SPD, because students spend numerous hours in school. Therefore, it is important for professionals working in a school to be aware of this disorder. To be aware of and knowledgeable about SPD means to understand that sensory issues can greatly affect a student in the school setting, as environmental factors play a significant role in how the student reacts and behaves to stimuli. There is great importance of collaboration between the professionals who support students in the school setting and how they communicate strategies that can alleviate overload or underload of sensory input.

As stated previously in this chapter, SPD is not included in the DSM-5S. As a result, there are no formal medical diagnoses of SPD, like there are for disorders like Autism Spectrum Disorder (ASD) or Down Syndrome. Still, whether it exists by itself, or it is a consequence of another disorder, SPD can create great challenges for students and it is worthy of the expertise of multiple professionals, and the attention and awareness of those working in the educational field. With the increasing numbers of ASD diagnosis, it is important to note that over 80% of children with Autism Spectrum Disorder (ASD) exhibit sensory processing problems (Ben-Sasson et. al, 2009). Similarly, Ghanizadeh (2011) claims that SPD is more common in children with ADHD
than in typically developing individuals. These percentages in itself provide the importance for educational professionals to have awareness of Sensory Processing Disorder, and of collaboration with other specialists to provide support systems that will aid in academic and socio-emotional success for these students.
Chapter III

Methodology

Introduction

This study investigated the level of awareness of Sensory Processing Disorder among professionals in an elementary school setting, as well as how much they participate in interprofessional collaboration to support students who have sensory processing disorder (SPD). This research investigation was multi-faceted. One facet included a survey to measure the awareness of SPD among professionals in an elementary school setting. The other facet of this research included observations of students with SPD within an elementary public school setting. This chapter will describe the setting of the study, participants, and the process that was used within the research. An explanation of how the baseline data was collected and observation procedures will be described. Methods for analyzing the data gathered will be explained as well.

Confidentiality

Permission to conduct this study was given by the University of Arkansas Institutional Review Board ([IRB]), as well as the administration of the school where the study has taken place (see Appendix). Permission to participate in this study was obtained prior to the commencement of the project. The Informed Consent statement explained the purposes and procedures of the study and why observation was necessary for the intent of the study. It also explained that participation is completely voluntary and that there would be no reward or penalty for participating. It further explained that the occupational therapist, who the researcher observed in the school setting, may withdraw from the proposed study at any time without penalty. Confidentiality was maintained to the extent allowed by State and Federal law and University policy, and assured by the researcher throughout the establishment of a code. All observational
notes were kept in a journal, in which only the researcher had access to and was kept confidential.

**Demographics of Survey Participants**

In total, 48 professionals answered the survey that was distributed by the investigator. Of these 48 people, 39.6% serve in the Northwest Arkansas Education Cooperative, 27.1% serve in the Guy Fenter Education Service Cooperative, 25% serve in the Southwest Arkansas Education Cooperative, 6.3% serve in the Northeast Arkansas Education Cooperative, and 2.1% serve in the Southeast Arkansas Education Cooperative (*graph 1*).

![Pie chart showing cooperative regions](image.png)

*graph 1.*

The 48 professionals were also asked to answer questions about their demographics:

- **What is your profession?**
  - Classroom teacher 45.8%
  - Special Education Teacher (16.7%)
  - Principial (10.4%)
  - Occupational therapist (4.2%)
  - Student teacher (4.2%)
  - Speech-language pathologist (2.1%)
➢ Behaviorist (2.1%)
➢ Dyslexia therapist (2.1%)
➢ Educational examiner (2.1%)
➢ Reading interventionist (2.1%)
➢ Behavior support specialist (2.1%)
➢ Instructional facilitator (2.1%)
➢ Assistant principal (2.1%)
➢ Fayetteville Public Schools Lead SLP (2.1%)

What is your profession?
48 responses

graph 2.

- How many years have you been in your profession?
  ➢ Over 20 years (29.2%)
  ➢ 12 to 15 years (18.8%)
  ➢ 16 to 20 years (16.7%)
  ➢ Less than 1 year (12.5%)
  ➢ 8 to 11 years (10.4%)
➢ 4 to 7 years (8.3%)

➢ 1 to 3 years (4.2%)

How many years have you been in your profession?
48 responses

● Do you speak two or more languages? If yes, please list which language(s). If no, write NA.

➢ Yes: English, Spanish, French, Creole (2.1%)

➢ Yes: English and Spanish (2.1%)

➢ No/NA (95.8%)
Description of District and School Demographics of Observation Setting

District setting. The study took place at a school district in Northwest Arkansas. Demographic information provided in this section is based on the 2019-2018 school year (U.S. News, n.d.). The school district serves students from pre-kindergarten through twelfth grade. The district in which the school is located has a total of 10,233 students in 16 schools.

The population within the school district consists of 65.3% White students, 12.3% Hispanic/Latino students, 2.9% Asian/Pacific Islander students, 1.5% Native Hawaiian or Other Pacific Islander, 9.8% African American students, 0.4% American Indian students, and 7.8% students of Two or More Races. Figure 1. illustrates the racial demographics for the school district in which observations were conducted.
**School setting.** The elementary school where the study took place has a total population of 897 students. Demographic information provided in this section is based on the 2019-2018 school year (U.S. News, n.d.). The population consists of 42.6% White students, 22.0% Hispanic/Latino students, 3.0% Asian/Pacific Islander students, 3.2% Native Hawaiian or Other Pacific Islander, 19.2% African American students, 0.6% American Indian students, and 9.5% students of Two or More Races. *Figure 2.* illustrates the racial demographics for the elementary school in which observations were conducted.
Data Collection Methods

This study utilized mixed-methods to collect data and reach the results. Quantitative data included data about the level of awareness of SPD and the degree of interprofessional collaboration in which professionals participate was collected through a survey. Qualitative data about SPD, included observational data (weekly anecdotal records) about the strategies OTs and classroom teachers use to support students and how these strategies support and impact a student’s daily school experience.

Survey. A survey on Google Forms was distributed to the directors of educational cooperatives in Arkansas. The investigator requested that the survey be sent to the professionals of each cooperative in the targeted areas in elementary schools (principals, classroom teachers, special education teachers, speech therapists, and/or occupational therapists). Participation in the survey was voluntary. There were 44 questions in total, the majority being true/false or based on a Likert scale. The two final questions were open responses (see Appendix B). The survey is titled, *Measuring Awareness of Sensory Processing Disorder in an Elementary School Setting.*
The survey was open from February 1st, 2023, to March 1st, 2023. The survey could be completed in 20 minutes, minimum. Professionals who did participate and chose to share their contact information received a brochure, *Sensory Processing Disorder Handbook*, (see Appendix D) that was designed by the researcher in alignment with research and school-based observations.

Example of survey questions asked:

- I have taken college coursework relating to children with special needs that specifically addressed the topic of Sensory Processing Disorder or Sensory Integration Dysfunction.
- I have heard about Sensory Processing Disorder or Sensory Integration Dysfunction.
- I know how to identify the signs of Sensory Processing Disorder.
- My program has a formalized protocol for referring students with significant behavioral needs when needed.
- Please briefly share your knowledge about what a Sensory Diet is.
- I collaborate with other professionals in the school to improve the intervention of a student with special needs.

**Observations.** The researcher observed an occupational therapist (OT) in an elementary school in Northwest Arkansas that serves kindergarten through sixth grade (ages 5 through 12) for a total of six weeks (see Observation Schedule, *Table 1*). Observations were primarily conducted in structured learning service classrooms (SLS classrooms), general education classrooms, and at the school’s sensory room with the occupational therapist (OT) providing strategies and intervention. The researcher followed the schedule of the occupational therapist, so
there was no specific setting and amount of time allocated to students during the observation time. The schedule primarily depended on daily transitions, and specific challenges that occurred for students during the morning. At the end of the six weeks, a total of 10 different students were served by the occupational therapist that was observed. All sessions with a student were one-on-one, usually in the sensory room or in a SLS classroom, with most strategies addressing daily transitions for academic and social-emotional challenges. The researcher observed while the OT supported students with sensory processing disorder (SPD), and focused on strategies for these students to maintain success in academics or social-emotional regulation.

Table 1. Observation Schedule and Summary of Observations.

<table>
<thead>
<tr>
<th>Week</th>
<th>Time of Day and Observation Setting</th>
<th>Summary of Observations</th>
<th>Strategies Implemented by Occupational Therapist (OT)</th>
<th>Interprofessional Collaboration (IPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Time of Day: 8:30-10:45 am Setting: SLS classroom, PE class, and Sensory room</td>
<td>The researcher observed the OT support (6) students during the observation time. Most were observed in the structured learning service (SLS) classroom or the sensory room. The researcher observed the OT work with one student during PE class as well. Most observations were during regular caseload/required therapy time. A few times, the OT stepped in to help during a meltdown or sensory dysregulation. Most of the times when she stepped in to</td>
<td>Student-led structured activities; OT knows about toys and objects that calm down each student; Know what type of sensorial input the student seeks so activities can target that; Breaking down complex tasks so that students do not feel overwhelmed; Implement a predictable and structured schedule (posted in the SLS classroom for students</td>
<td>Collaboration observed between the structured learning classroom teacher, OT, and paraprofessionals. Usually an in-the-moment conversation on what they can do to best support a student or several students at once. For example, OT would ask the classroom teacher or paraprofessionals which student she should take to create a calmer</td>
</tr>
</tbody>
</table>
| **Week Two** | **Time of Day:** 8:30-10:45 am  
**Setting:** SLS classroom, sensory room, playground | help, the student was already a part of the OT’s caseload.  
Common dysregulation triggers that were observed were transitions, not receiving the sensory input they seek, being in an overwhelming environment where there is a lot of noise and people.  
Common behaviors were to have a visual for upcoming transitions. | environment for everyone. OT would also talk to the classroom teachers and paraprofessionals about strategies they can use with a specific student. |
| --- | --- | --- | --- |
|  |  | The researcher observed the OT work with 6 different students. Most of them were either in the SLS classroom or in the sensory room. The researcher observed the OT work with one student in the playground as well.  
Most observations were during regular caseload/required therapy time.  
Common dysregulation triggers observed were a student getting out his/her usual routine, being in an overwhelming environment, and transitioning.  
Behaviors observed were vocalizations, tensing the body, going up on classroom shelves, laying on the floor, hitting oneself or part of the body on a classroom table, and running.  
A student was avoiding work because he did not like | Deep pressure hugs; Paying attention to body language to understand if a student is overwhelmed; Give structured choices (closed set of 2-3 choices); Corregulation before self-regulation; Have students do push ups; Breathing exercises; Sit on bouncing yoga ball.  
Collaboration observed between the structured learning classroom teacher, OT, and paraprofessionals. It was usually an in-the-moment conversation on what they can do to best support a student or several students at once. For example, OT would ask the classroom teacher or paraprofessionals which student she should take to create a calmer environment for everyone. OT would also talk to the classroom teachers and paraprofessionals about strategies they can use with a specific student. |
| Week Three | The researcher observed the OT work with 4 different students. Most of them were either in the SLS classroom or in the sensory room. The researcher observed the OT work with one student in the library as well. This week, one of the students had a big sensory overload meltdown. The student banged his head, bit, hit, and choked a teacher. The SLS classroom teacher and OT worked together to help him with regulation. |
| Week Three | Pillow between hard surface and student’s head; Pack of ice to student’s chest to activate vagus nerve to help calm down (will not work on every child); Got student to safe space; Coat and shoes off; After student calmed down a bit, OT offered him squeezes; Paraprofessional brought a squeeze machine from the sensory room for the student to use in the SLS classroom. |
| Week Three | While a student was having a big meltdown, the paraprofessionals worked together to evacuate the other students from the SLS classroom. Then, the SLS classroom teacher and the OT stayed to aid the student having a meltdown. |

| Week Four | The researcher observed the OT work with 5 different students. Most of them were either in the SLS classroom or in the sensory room. The researcher observed the OT work with one student in a Gen Ed classroom and another in the school’s gym for picture day. |
| Week Four | Student was feeling dysregulated in the Gen Ed classroom so OT gave him hand squeezes and he went to the classroom’s calming corner; Noise canceling headphones; Structured choices; Working with student to ask for help; Using |
| Week Four | The OT gave a paraprofessional some tips on how to help a dysregulated student. OT mentioned that paraprofessionals try to implement what the OT is working on with the students throughout the |
Most observations were during regular caseload/required therapy time. One student that the OT worked with this week was not on the OT’s caseload. This student has a history of trauma and the OT is trained in trauma informed occupational therapy.

<table>
<thead>
<tr>
<th>Week Five</th>
<th>The researcher observed the OT work with 4 different students. All observations were either in the SLS classroom or in the sensory room. The OT focused on aiding students with transitions and classroom work.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-10:45</td>
<td>Grading tasks down (decreasing the difficulty of a task); having students bounce on yoga balls; hand squishes; deep pressure hugs; noise canceling headphones; transition activities such as making a game out of cleaning up.</td>
</tr>
<tr>
<td>SLS classroom</td>
<td>Collaboration observed between the structured learning classroom teacher, OT, and paraprofessionals. In general, the OT along with the other professionals try to figure out what sensorial input a student is seeking so they can give the student what he</td>
</tr>
<tr>
<td>Sensory room</td>
<td>student’s day in the school. It is important for other professionals to carry-out certain parts of intervention consistently so that students generalize the coping skills they have learned.</td>
</tr>
</tbody>
</table>

OT stepped in to help with a student who is not on her caseload but was having meltdowns due to trauma. The OT is trained in trauma infrared occupational therapy and knows of strategies to help the student. Therefore, the aided the student and also helped the other professionals with calming the student down.
The researcher observed the OT work with 4 different students. All observations were either in the SLS classroom or in the sensory room. The OT focused on aiding students with classroom work. Ice pack on a student’s chest and neck; asking student questions about the environment to help him with regulation; hand squeezes; deep pressure hugs. Collaboration observed between the structured learning classroom teacher, OT, and paraprofessionals. OT stepped in to help regulate students when they were having a meltdown.

**Post-data Analysis**

The researcher analyzed the results of the survey to determine general awareness of Sensory Processing Disorder among professionals in elementary school settings in Arkansas. Anecdotal records from observations of the OT were examined to determine patterns and trends about strategies used to support children with SPD and to determine the degree of interprofessional practices that were used by the occupational therapist in the school setting.

From the six-week observation records, the researcher also analyzed anecdotal notes to determine strategies that were effective for supporting students with SPD. The researcher created an informational brochure about SPD for distribution to professionals in the participating education cooperatives. The brochure outlined strategies that may be effective to support students with SPD in the elementary school setting in Arkansas public schools.
Summary

This study investigated the level of awareness of Sensory Processing Disorder among professionals in an elementary school setting, as well as how often they participate in interprofessional collaboration to support students in the elementary school and/or classroom setting. The study also investigated effective strategies that professionals use to promote greater regulation for students with sensory processing disorder (SPD). Data were analyzed to determine awareness of SPD, the degree of interprofessional collaboration (IPC) and practices (IPP), and use of practices/strategies for promoting academic and social-emotional success in an elementary school setting in a Northwest Arkansas school district.

The methodology section describes the setting of the study, the participants, and the process used in an attempt to answer the following questions: What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas? To what degree are interprofessional collaboration (IPC) and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? Results of the study will be outlined in Chapter IV.
Chapter IV

Results

Chapter IV provides analyses of data collected for this study which was designed to address the research questions, *What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas?* and *To what degree are interprofessional collaboration (IPC) and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting?* Data are presented in narrative text and supported by tables and graphs. The purpose of this study was to investigate the level of awareness of Sensory Processing Disorder (SPD) among professionals in an elementary school setting, analyze interprofessional collaboration used to support students who have SPD, as well as to learn about practices and strategies used to support students with SPD achieve academic and social-emotional success during the school day. Over the course of this study, the investigator distributed a survey to educational cooperatives in Arkansas to gain data and perspectives about the research questions. The researcher also observed an occupational therapist for six weeks to gain more information about the awareness of educators regarding SPD, the day-to-day experiences of students with SPD, and practices/strategies used to support students with SPD in an elementary school-based setting.

 Archived Data and Pre-collection Data

Prior to the beginning of this investigation, the researcher conducted a literary review of research studies and articles regarding sensory processing disorder (SPD), the impact of SPD on a student’s academic and socio-emotional success, the degree of awareness of professional knowledge about this topic, and the practices/strategies used by professionals to support students with SPD. The literary review indicated that there seems to be a lack of awareness among
educators about SPD and how it affects a student’s academic and socio-emotional success. For example, 87% of the Head Start program staff is familiar with SPD; however, only 17% provided an accurate definition of this disorder (Alibrandi et al., 2014). This relates with a need for more in-depth research on the topic, along with the fact that the Diagnostic and Statistical Manual (DSM-5) does not yet list SPD as a disorder, which could create a greater sense of urgency for professionals to learn more about SPD if it was classified as a disorder. This leads to the assumption that some professionals may not consider SPD as a challenge that merits specific practices and intervention strategies. Therefore, this study focuses on understanding more about SPD and the academic and socio-emotional challenges that are associated with it. Additionally, this study focuses on learning about how much knowledge there is regarding this disorder among educators in Arkansas, which would promote the need for greater awareness about SPD in the school setting. With targeted knowledge, professionals can begin to identify whether SPD presents challenges that merit specific practices in the educational setting.

Survey Data Analyses

SPD awareness. Of the 48 professionals who responded to the survey, 89.6% have completed college coursework that relate to children with special needs and/or developmental delays. Similarly, 63.8% have completed coursework relating to behavioral disorders. On the other hand, only 25% have taken college coursework that specifically addressed SPD or Sensory Integration Dysfunction (SID). In comparison to completion of college coursework, 83% of respondents have attended professional training relating to children with special needs and/or developmental delays, and 75% have attended training that addresses behavior disorders. In contrast, less than half (42.6%) have attended training that specifically addresses SPD.
In a Likert-based scale from 1 to 5 (1 = strongly disagree and 5 = strongly agree), 66.7% chose 4 or 5 when surveyed about feelings of confidence in their ability to recognize behaviors that may indicate Autism Spectrum Disorder (ASD). The remainder of respondents selected either 3 or 4, and no respondent for the survey selected 1. Moreover, over 75% of the professionals surveyed chose 4 or 5 when asked if they were confident about their ability to recognize Attention Deficit Hyperactive Disorder (ADHD) and in identifying speech deficits or delays. In contrast, when asked if respondents feel confident in their ability to recognize behaviors that may indicate SPD, 35.4% answered with a 4 or 5, remaining responses indicated 31.3% were neutral, and 33.4% answered with a 1 or 2 about their confidence.

In analysis of the survey data, it appears that the majority of participants surveyed have basic knowledge about SPD (91.7%) and have worked with students who have SPD (77.1%). Also, 57.4% strongly agree or agree that they are familiar or aware of SPD; however, only 41.6% of the professionals strongly agree or agree that they know how to identify the signs of SPD. Also, 50% strongly agree or agree that they are aware of strategies that can support students who have SPD, while the other 50% strongly disagree, disagree, or are neutral. Similarly, 50.1% of the professionals have implemented strategies in their classrooms or the school setting to help students who have SPD. Despite this, only 35.4% strongly agree or agree that if they had to, they would be able to explain SPD.

In regard to the awareness of resources regarding SPD, 52.4% have not read resource books about SPD, but are familiar with at least one of the titles (such as The Out-of-Sync Child or Sensational Kids). The resource most have read or have knowledge of is the DSM-5 (35.7%). Similarly, 79.2% of respondents have had one or more experiences that influenced their level of SPD awareness. Some of these experiences are reading books of choice (31.3%), reading books
for a class (29.2%), attending professional workshops that directly or indirectly addressed SPD (47.9%), knowing someone with SPD (39.6%), internet research (37.5%), and personal experiences at work, such as conversations with a colleague (64.6%). To finalize the survey results, 83.3% indicated that they are not qualified, nor comfortable, identifying characteristics of SPD in a student.

At the conclusion of the survey, there were two non-mandatory open response questions. The first was, “Please briefly share your knowledge about a Sensory Diet”, in which only 40 out of the 48 participants completed the question. Additionally, 14 of the professionals answered “NA”, “I do not know”, or “I have no idea.” The other 26 professionals submitted an answer for the question. Of these 26, only 12 correctly answered that a sensory diet is developed by an occupational therapist, and it describes scheduled activities throughout a student’s day-to-day life that can provide the sensory input he/she requires. Interestingly, 6 of the 26 professionals answered that a Sensory Diet pertains to food sources.

**Interprofessional Collaboration (IPC).** Of the professionals surveyed, 66.7% strongly agree or agree that they have knowledge about interprofessional collaboration. Similarly, 66.6% strongly agree or agree that they know of the benefits of interprofessional collaboration. For both questions, 18.8% of the professionals selected number 3 on a Likert-based scale (neutral). Only 41.6% agree or strongly agree that they have received training in this topic. Despite this, 91.7% agree or strongly agree that they collaborate with other professionals in an academic setting to improve successful experiences of a student. Also, 59.6% agree or strongly agree that there is a focus on interprofessional collaboration at their work environment. Similarly, 55.3% agree or strongly agree that interprofessional practices are a consistent part of their day-to-day work experiences.
Observations

During weekly observations, the researcher focused on determining patterns as to why students would feel sensory dysregulation, understand common triggers, and become familiar with practices and strategies the OT used to provide support and teach self-regulation. Each student is unique and triggers sometimes varied between each student that was observed.

Occupational Therapist (OT). The researcher observed one OT in an elementary setting during the six weeks of observation. The role as a school-based occupational therapy practitioner (OTP) is to support students in the natural environment when they experience challenges while participating in social experiences or accessing the curriculum. The way in which the OT utilizes self-regulation strategies is unique to each student. The OT provides early intervention through the program, Response to Intervention (RTI), whole-class or small group interventions, staff training, suggestions for Universal Design (UDL) throughout the school, and direct intervention strategies that are implemented within the classroom setting for individual students, as well as serving on many interprofessional collaborative teams, such as the RTI team and Assistive Technologies Team. The common areas of occupation that the OT addresses are academic, play, leisure, social participation, self-care, and transitional/vocational skills. The OT also conducts environmental and activity analysis to address physical, cognitive, psychosocial, and sensory components of performance, with the goal of reducing or eliminating barriers to successful participation in the school environment. The way in which barriers are addressed includes several factors. The main factors are the student’s abilities, the educational curriculum, and the classroom environment. Eliminating barriers usually involves environmental adaptations, curriculum modification, proposing and teaching about accommodations to other professionals (which is an example of IPP and IPC), and preparing
for the post-graduation transition.

The amount of time the OT spends with students per week depends on the student, the mandated Individualized Education Plan (IEP), and other factors that affect successful participation in the school environment. It is common for school-based OTs to serve students once per week between 30 minutes or 120 minutes per month according to the time outlined in the IEP. Additionally, some students are served once a week for 30 minutes, some twice a week for 30 minutes, some once a week for 15 minutes, and others once a week for 60 minutes. A student’s service time per minute is set monthly (120 minutes/month, 240 minutes/month, 60 minutes/month, 90 minutes/month, etc.), which allows the OT some flexibility on how often they are served in the school setting. If a student needs more support at the beginning of the month, the OT will serve him/her more, then serve less at the end of the month, as the need is reduced and less support is required. As long as a student's IEP required time is met, the OT has flexibility in the daily schedule within the school setting.

Although most of the time the OT serves the targeted caseload, occasionally there are opportunities to support students who do not have an IEP or Section 504 Plan, meaning that they are not on the therapist’s caseload. Usually this occurs when a student needs immediate emotional regulation and sensory supports for de-escalation. The OT observed in this study has an advantage for helping students co-regulate due to professional background experiences. Also, relationships are established with other students through a push-in, co-teaching model. The fact that the OT does not place demands on students on the workload is beneficial as this makes it easier to coach students through an activity that targets their parasympathetic response, because the OT, as a co-teacher, is a familiar face that students trust and have cultivated positive interactions with in the classroom and/or educational setting.
Week one observations.

**Time:** Observations were conducted on a Monday morning from 8:30am to 10:45am.

**Setting:** Observations primarily took place in the school’s Structured Learning Service (SLS) classroom, Physical Education (PE) class, or in the school’s sensory room.

**Summary of Observations:** The researcher observed the OT support (6) students during the observation time. Most were observed in the SLS classroom or the sensory room. The researcher observed the OT work with one student during PE class as well. Most observations were during regular caseload/required therapy time. Occasionally, the OT stepped in to help during a meltdown or sensory dysregulation. In most instances, the OT intervened to help a student that was already part of the caseload. Common dysregulation triggers that were observed were during transitions, students not receiving the sensory input they seek, and being involved in an overwhelming environment where there was an abundance of noise and multiple interactions with people.

**Strategies implemented by OT:** The OT implemented several strategies to support students with SPD. The OT implemented student-led structured activities to give students a sense of choice in what they could do while maintaining structure. Additionally, the OT knew about toys and objects that calm down each student, for example, some students enjoy rolling a spiked ball on their arms and hands. Similarly, the OT also knew what type of sensorial input each student seeks so activities could provide these specific sensory inputs. Breaking down complex tasks so that students
did not feel overwhelmed was a helpful strategy as well. An imperative strategy used was implementing predictable and structured schedules for each student, which were posted in the SLS classroom for students to have as a visual for upcoming transitions.

**Interprofessional Collaboration (IPC):** There was collaboration observed between the structured learning classroom teacher, OT, and paraprofessionals. These collaborations were usually an in-the-moment conversation about what they could do to best support a student or several students during that specific time. For example, the OT would ask the classroom teacher or paraprofessionals which student needed a calmer environment. The OT would also provide the classroom teachers and paraprofessionals with specific strategies they could use to support specific students.

**Week two observations.**

**Time:** Observations were conducted on a Monday morning from 8:30am to 10:45am.

**Setting:** Observations took place in the school’s SLS classroom, sensory room, and in the playground. The playground time was only with students who are in the SLS classroom and did not include interactions with general classroom students.

**Summary of Observations:** The researcher observed the OT work with 6 different students. Most were either in the SLS classroom or in the sensory room. The researcher observed the OT work with one student on the playground as well. This student was feeling dysregulated on this particular morning as he was out of his usual routine the previous day. He was throwing leaves and rocks on the playground, which is a behavior that was not usually presented. Most observations on this day were during the OT’s regular caseload/required therapy time. Common dysregulation triggers
observed were a student getting out his/her usual routine, being in an overwhelming environment, and during transitions. Additionally, behaviors observed were vocalizations, tensing the body, climbing on classroom shelves, laying on the floor, hitting oneself or hitting a part of the body on a classroom table, and running away. Today a student was avoiding work because he did not like the classroom chair, so he was given the option to sit on a U-shaped chair, which was more comfortable and provided a more sensory appropriate option for the student.

*Strategies implemented by OT:* An important strategy that the OT uses to understand when a student is feeling dysregulated is paying attention to his/her body language. Sometimes a student might be stemming in a way that seems like he/she is happy or excited, but his/her body is extremely tense, which is an indication of dysregulation. It is important to understand a student’s body language, as this is a big indicator of sensory dysregulation. Another strategy observed that many students enjoyed were deep pressure hugs. Additionally, giving structured choices (closed set of 2-3 choices) helped students to not feel overwhelmed with options. One of the students observed does not like the sensation of touch, so the OT is still working to determine a successful regulation strategy, such as providing more visual stimulation. Other strategies the OT used to help students regulate were having students do push ups, breathing exercises, and sitting on a bouncing yoga ball. Each of these options target different senses. It is important to recognize which sensory input a student is seeking to provide him/her with the necessary activity. An important aspect of teaching self-regulation to a student is that there needs to be corregulation before self-regulation. The OT explained that first there needs to be corregulation, meaning
that the student has support in managing strong feelings, instead of having to do it by
him/herself. With time, he/she begins to internalize these strategies and starts
implementing them by him/herself (self-regulation).

*Interprofessional Collaboration (IPC):* Collaborations between the OT, SLS
classroom teachers, paraprofessionals, and other professionals were in-the-moment
conversations about what they could do to best support a student or several students.
For example, the OT would ask the classroom teacher or paraprofessionals which
student needed removal to provide a calmer environment for everyone. The OT would
also talk to the classroom teachers and paraprofessionals about strategies they could
use with a specific student to encourage self-regulation. The OT and SLS teacher also
brainstormed on what they could do when a student did not want remain seated to
complete school work

**Week three observations.**

*Time:* Observations were conducted on a Monday morning from 8:30am to
10:45am.

*Setting:* Observations were primarily in the SLS classroom or sensory room. The
researcher observed the OT also work with one student in a general education class
when the class was in the library setting.

*Summary of Observations:* The researcher observed the OT work with 4
different students on this day. Most were either in the SLS classroom or in the sensory
room. The researcher also observed the OT work with one student in the library as
well. The student was with his general classroom peers and they were sitting on the
floor while watching a video on the library’s television. The student with SPD was
accompanied by a paraprofessional as well. He was stemming a bit, but was feeling very regulated, so the OT did not work with him for an extended period of time. The overall dysregulation triggers observed were a student getting out his/her usual routine, being overwhelmed in the environment, and challenges in transitioning. This week, one of the students had a major sensory overload meltdown. The student banged his head, bit, hit, and choked a teacher. The SLS classroom teacher and OT worked together to help him gain regulation.

**Strategies implemented by OT:** To keep the student from injuring himself, the OT and SLS teacher put pillows between hard surfaces and the student's head. The OT also put a pack of ice on the student's chest to activate the vagus nerve, which sometimes helps people calm down. This strategy does not work with every child, so it is important to understand individual student reactions. The OT and SLS teacher were able to get the student to a safe space, and remove a coat and shoes, as the student was feeling very hot. After the student calmed, the OT offered squeezes and deep pressure hugs. A paraprofessional brought a squeeze machine from the sensory room for the student to use in the SLS classroom to continue in gaining regulation.

**Interprofessional Collaboration (IPC):** This week, while a student was having an emotional meltdown, the professionals worked together to evacuate the other students from the SLS classroom. The SLS teacher and the OT worked together to aid the student having a meltdown to regain composure. They provided the student with objects that would help him calm down. Together, they also ensured that the student would not hit and harm himself or others. They did this by putting pillows between hard surfaces and the student’s head, and between themselves and the student. One of
the paraprofessionals also brought a squeeze machine from the sensory room to the SLS classroom so that the student did not need to leave the classroom and walk down the hallway to the sensory room.

**Week four observations.**

**Time:** Observations were conducted on Monday mornings from 8:30am to 10:45am.

**Setting:** Observations were in the general education classroom, in the gym for the school’s picture day, SLS classroom, and the sensory room.

**Summary of Observations:** The researcher observed the OT work with 5 students. Most were either in the SLS classroom or in the sensory room. Common dysregulation triggers observed were being in an overwhelming environment, overwhelming tasks, and transitioning. Behaviors observed were vocalizations, tensing the body, climbing on classroom shelves, running, and rocking back and forth. Aside from the SLS classroom and sensory room, the researcher observed the OT work with one student in a general education classroom and another in the school’s gym for picture day. Most observations were during regular caseload/required therapy time. Additionally, one student that the OT worked with this week was not on the OT’s caseload. This student has a history of trauma and the OT is trained in trauma-informed occupational therapy and had knowledge of strategies to support this student.

**Strategies implemented by OT:** On this day, the OT worked with one student in the general education classroom. The student and his peers were sitting on the floor/carpet area, while the teacher read a story to the students. This particular student was feeling overstimulated, so the OT gave him hand squeezes. He also went to the
classroom’s calming corner for a few minutes to gain composure. He chose this by himself, which is a self-regulation strategy that he had previously learned. Other strategies the OT used with students on this day were noise canceling headphones, structured choices, working with a student to ask for help, and using a spiked ball on a student’s hands and back.

**Interprofessional Collaboration (IPC):** The OT gave a paraprofessional some tips on how to help support one of the students. The OT mentioned that the paraprofessionals try to implement what she is working on with her students throughout the school day. It is important for other professionals to consistently carry-out certain aspects of an intervention so students generalize the coping skills they have learned. For example, the OT tries to teach her students to ask for help when they are feeling overwhelmed. The paraprofessionals model this so that students learn they can ask for help in any environment, not just with the OT. Another interprofessional collaboration observed was that the OT stepped in to support a student who is not on her caseload, but was having meltdowns due to a previous situation of trauma. The OT is trained in trauma-informed occupational therapy and knows of strategies that could help a student who has experienced trauma. Therefore, she aided the student and also helped advise other professionals with strategies in calming the student.

**Week five observations.**

*Time:* Observations were conducted on a Monday morning from 8:30am to 10:45am.

*Setting:* Observations took place only in the SLS classroom and in the sensory room.
**Summary of Observations:** The researcher observed the OT work with four different students. All observations were either in the SLS classroom or in the sensory room. Common dysregulation triggers observed were being in an overwhelming environment and during transitioning. The OT focused on aiding students with coping during times of change/transitions and in completing classroom work. She would assess which students were having a difficult time with transitioning or with class work and would work with him/her. For example, a student had a hard time transitioning from one activity to another and started to get angry. The OT had him play a game for a few minutes with a friend, made a game out of cleaning up, and he was able to transition into his next activity.

**Strategies implemented by OT:** The OT gave a visual representation of the activity that a student was required to do, which provided him with visual and verbal input. The OT also graded tasks down (decreased the difficulty of a task) and chunked the sequence of directives. Additionally, the OT provided noise canceling headphones to one student. She also had certain students bounce on a yoga ball to provide movement and which helped with regulation. The OT often provided hand squeezes and deep pressure hugs. Lastly, she provided students with transition activities such as making a game out of cleaning up. One of the students continued to rock himself back and forth, which is a self-regulation strategy he has learned.

**Interprofessional Collaboration (IPC):** The OT along with the other professionals tried to determine what sensorial input students were seeking so they could give students what they needed through safe activities to maintain success in the environment. The OT also supported a student during a classroom activity along with
the SLS teacher.

**Week six observations.**

**Time:** Observations were conducted on a Monday morning from 8:30am to 10:45am.

**Setting:** Observations took place in the SLS classroom and in the sensory room.

**Summary of Observations:** Observations today were delayed because the OT was supporting a student who was having a severe meltdown, so she was not available to meet the researcher in the school’s front office. As the observations began, the researcher observed the OT work with three different students. All observations were either in the SLS classroom or in the sensory room. Common dysregulation triggers observed were due to transitioning. The OT focused on supporting students during transitions and maintaining self-control during classroom work. She would assess which student was having a difficult time with transitioning or with class work and focus on individual support time and strategies with this student. During most of the observation time, the OT worked with one student who was feeling dysregulated and angry. This student kept trying to leave the SLS classroom and would not let go of the classroom’s door handle. After calming the student down, the OT played a game with him, in which other students in the SLS classroom joined. Then, she helped him complete his class work for a few minutes. She aided another student with his class work and another with typing skills.

**Strategies implemented by OT:** The OT put an ice pack on one of the student’s chest, which greatly aided in calming him down. She also asked the student questions, such as the color of her shirt or of his shoes. Eventually she introduced a game for him
to play, which helped him transition into the class activity he needed to do. Other strategies implemented by the OT with other students were hand and arm squeezes, and deep pressure hugs.

**Interprofessional Collaboration (IPC):** The OT, along with the other professionals, tried to determine what sensorial input students were seeking so they could give them what they needed through safe activities/strategies. The OT also supported a student with a classroom activity, along with the help of the SLS teacher.

**Observations Takeaways**

Common dysregulation triggers identified during these six weeks were noise, loudness, not feeling safe in a certain space, feeling overwhelmed in an environment, and transitioning. There was always at least one student feeling dysregulated during the investigator’s observation time, which was on a Monday morning between 8:30am and 10:45am. Because observations were conducted at the same time each Monday, there was no data collected other times during the school day or other days of the school week to determine additional triggers and patterns for students experiencing dysregulation. However, it could be determined that the transition from the home to the school environment, generally caused sensory challenges for students, and can be inferred that after a weekend and change from the structure of the school setting, this was a challenge for students who experience SPD.

To aid and support students experiencing dysregulation, the most common strategy observed was offering differing forms of squeezes. Some students really enjoyed having their hands squeezed and massaged, as it helped them calm down. Other students enjoyed tight hugs or light head squeezes. Of these strategies, hand squeezes were the most common strategy observed. Another strategy commonly observed was giving students spiky massage balls for
them to roll on their arms, hands, legs, under their feet, etc. Each person has their own sensorial preferences, however, it should be noted that there were students who did not enjoy touch, so these strategies were not successful for them. Other measures, such as noise canceling headphones or activities that give visual stimulation (asking about the colors in the environment, for example) were used. It is important to keep in mind that each student has different sensory needs and enjoys different activities that provide the required input. What works for one might not work for the other. It is necessary to take the time to understand and observe each student that may have SPD, so that regulation activities can target what a specific student needs to address his/her needs.

Summary

This chapter has presented analyses of all data collected for the purposes of answering the following questions: What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas? and To what degree are interprofessional collaboration (IPC) and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? Data were collected through a survey titled, Measuring Awareness of SPD in an Elementary School Setting, that investigated questions about knowledge and perceptions in regard to the awareness of SPD and degree of interprofessional collaboration practices in elementary schools in Arkansas. In addition to the survey, the investigator observed an OT for six weeks to better understand the academic life of students with SPD, find patterns of common triggers, and determine effective strategies used by the professionals who support students with sensory processing disorder. Chapter V will provide a discussion of the results, conclusions drawn from the results, limitations of the research, and recommendations for further study.
Conclusions & Discussions

Introduction

Chapter IV finalizes this research paper by providing conclusions to the survey and observation findings. Additionally, there is a discussion of the study’s limitations, implications, and recommendations for future research.

Conclusions

In reviewing these results, the investigator concludes that there is a basic level of awareness about Sensory Processing Disorder (SPD) among professionals in elementary schools in Arkansas. A low majority (57.4%), is familiar with what SPD is. Additionally, only 35.4% agree or strongly agree that they feel confident in their abilities to recognize behaviors that may indicate SPD. Lastly, only 25% of the professionals have taken college coursework about this topic. SPD awareness could be deepened through college coursework and professional training that will specifically address strategies for supporting students with Sensory Processing Disorder. It was concluded that there is a greater need for more awareness on the importance of understanding SPD, strategies to support students, and characteristics and/or behaviors that students with SPD may present, in order for school-based professionals to be effectively prepared to support these students. The investigator also concludes the degree of the use of interprofessional practices and collaboration by educators in Arkansas. However, there should be more training on this topic and education of its importance to effectively support students with SPD in their academic and socio-emotional success.

In the survey, when asked to briefly explain a Sensory Diet, 40 of the 48 participants surveyed answered, in which 12 of the 40 answered correctly. During observations for this
project, the OT that was observed had the most knowledge about effective strategies for supporting students in developing coping skills and self-regulation. There was a high degree of interprofessional collaboration and the practices used between the OT and other professionals on a daily basis, as they continuously worked together to support the students with SPD.

These conclusions are in alignment with the literature review conducted for this research project. As stated in Chapter II, there is an enormous debate about SPD and the disagreement about this disorder (Arky, n.d.), which indicates that there is not an appropriate degree of awareness and use of interprofessional practices for supporting students with SPD. For example, 87% of the Head Start staff is familiar with SPD, but only 17% provided an accurate definition to the disorder (Alibrandi et al., 2014). Similarly, 57.4% of the professionals surveyed for this research project are familiar with SPD. However, only 35.4% claim they would be able to explain what the disorder is. Additionally, SPD is not included in the DSM-5, so it is not considered a stand-alone disorder. This results in further lack of awareness about SPD (Arky, n.d.). Furthermore, OTs are generally the professionals who have the most knowledge about SPD and the primary professionals to theorize that sensory processing issues are possible reasons for distress in a child, which causes him/her to present “inappropriate behaviors” (Arky, n.d.). This aligns with the results of the study and the researcher’s observations. Qualitative data from observations indicated that the OT had more knowledge and was relied on the most for strategies on how to support students with SPD and teach self-regulation. In addition, more training should be conducted to develop awareness on how to support students with SPD among professionals in elementary school settings for greater academic and socio-emotional success. Similarly, more training on IPC should be provided. 91.7% of the professionals participate in IPC but only 41.6% have received training in the topic. IPC is crucial to support students with SPD as it allows for all
professionals in a student’s school team to be on the same page about intervention, strategies, what the student is learning, among other aspects.

**Limitations**

**Observations limitations.** Observations in the elementary school in the Northwest Arkansas area had some potential limitations. The greatest limitation during observations was the observation schedule, which occurred only on Monday mornings (8:30am to 10:45am) of each week. Because of scheduling conflicts, the researcher was not able to observe students at different times of the day, and different days of the week. Therefore, the investigator was not able to collect observation notes on how much time professionals spend in meetings, planning, and collaborating with other professionals about strategies to support individual students in the classroom setting, in different therapy settings, the structured learning service (SLS) classroom, and in other school-based settings. Because of this, it is unclear in what ways they collaborate outside the Monday morning observation time, and how much time is spent during intentional interprofessional collaboration in discussion of specific students and planning supports that meet the individual needs of each student through observations; however, information from the OT was requested about this targeted area. Additionally, some of this information would be confidential, as some students were served through an Individualized Education Plan or Section 504 Plan. Observations during multiple days of the week and times during the school day would also have allowed the investigator to better understand influences on dysregulation, which can impact behaviors and school performance.

**Survey limitations.** The survey had potential limitations that could have impacted the results. The limitations identified are the following: no pilot study, low response turn-over from educational cooperatives, and lengthy survey responses were requested.
The investigator distributed the survey to all of the educational cooperatives in Arkansas. Unfortunately, most cooperatives did not respond to the request to send out the survey to their partnership schools. Furthermore, due to time constraints, the investigator was not able to find other ways to contact school professionals for the cooperative regions that did not respond or to find another method to recruit participants. Therefore, the survey responses do not represent the full scope of awareness for the whole state of Arkansas, as there are many educational cooperatives that are not represented in the survey. The educational cooperatives that responded to the survey are located in the west, northeast, northwest, southeast, and southwest regions of Arkansas. Even though all of the cooperatives who answered are located in different regions, only five of the fifteen educational cooperatives answered, which does not fully represent the state of Arkansas. Also, there is no response from the central regions of Arkansas to gain representational data in the state. Additionally, there was no pilot survey for this research project. A pilot study to a smaller group could have been distributed to see if there were any conflicts within the survey before sending it out to the educational cooperatives. Another limitation with the survey is that it was rather lengthy, with 44 questions, which might have resulted in some professionals not taking the time to complete the survey.

**Implications**

The number of professionals who have taken college coursework or attended training that specifically address SPD were lower than the numbers for other disorders. When asked if they have taken college coursework relating to children with special needs and/or developmental delays, 89.6% of the professionals answered yes. And for the same question, but relating to behavior disorders, 63.8% answered yes. In contrast, when asked if they have taken college coursework that specifically addressed the topic of SPD, 75% of the professionals selected no. A
similar trend was seen for professional training: 83% of the professionals have attended training related to children with special needs and/or developmental delays, and 75% have attended workshops related to behavior disorders. However, only 42.6% have attended professional development training that specifically addressed SPD. This implies that there is not a limitation of opportunities for professional development training on disability topics, but there does need to be more professional development on the topic of SPD. This is important so professionals can better support students experiencing challenges related to SPD. For example, having SPD requires learning self-regulation strategies, which are usually taught by the occupational therapist (OT) and reinforced by the classroom teacher. If all school-based professionals are aware of these strategies, they can work through interprofessional practices and focus on collaboration for consistency. This would allow for carry-out regulation strategies into other aspects of a student’s day, so that he/she learns and generalizes these strategies faster, and begins to have awareness of when to use them as challenges arise.

The survey also suggests that although most educators in Arkansas participate in interprofessional collaboration (IPC) practices, most do not receive training in how to collaborate in order to provide support for students across various professions. Professionals could benefit from more IPC development, so that they are aware of the importance of specific collaborations that address the needs and provide effective strategies for targeted students. Professionals would also be able to better understand the importance of their respective roles in the intervention of a student, and how they can effectively work together to carry-out intervention strategies from one setting to the another.

From the data gathered by the investigator during observations, several students with SPD had a difficult time transitioning during the morning, and after the time spent at home
during the weekend. It could be beneficial to create a structure and routine for transitioning at the beginning of the school week, and to ensure that all professionals who work with the student are aware of the common strategies needed to provide this structure. Also, if this is effective for the student, implementing transitional activities in the student’s daily routine during other times of the school day could be beneficial as well.

Based on survey results and on notes collected from the investigator’s observations, school-based professionals do participate in a continual degree of interprofessional collaboration. Yet, they could benefit even more by scheduled times during which they discuss the needs of targeted students who have SPD and plan for specific strategies to support them. Though no professional should overstep into another’s practice and area of expertise, it is helpful to have time for intentional collaboration and planning to share various practices that could prove to be beneficial for students. This way, each professional can share strategies related to their expertise that could be implemented for effective support of students. For example, if an OT implements certain strategies in therapy to help regulate a student, other professionals would benefit from knowing these regulation strategies. A student does not spend his/her whole day with an OT, so it is important that other professionals within various settings of the school are familiar with these strategies, so they can aid a student with regulation and eventually with the ability to self-regulate.

**Recommendations**

The results of this study indicate that although there is basic awareness about SPD, there are not as many educators who have participated in college coursework or professional training on this topic in the regions of Arkansas that provided responses to the survey. Future research could investigate the professional development opportunities for school-based professionals in
Arkansas and perhaps why the numbers of professional training specifically on SPD are so low. Similarly, although the majority of professionals participate in IPC, most have not received training in IPC. Future research could investigate the different college programs that Arkansas educators have attended and opportunities for IPC training that might be provided in an interprofessional manner between professionals that align with support of targeted disorders to support students.

Although the survey provided insight into the awareness of SPD among educators in Arkansas and the degree of interprofessional collaboration in which they participate, future research could create a shorter survey as certain questions were not as relevant to the topic of SPD and IPC. Also, if possible, future research could focus on ways to distribute the survey to ensure that more regions in Arkansas are represented in the responses.

The investigator was able to understand common triggers for students who have SPD through school-based observations, how professionals provide them with support strategies, provide regulation, and promote use of self-regulation strategies for when challenges arise during the school day. Observations in a school setting were very insightful during the observation time; however, additional day-to-day support for students who have SPD could be determined from various times for observations throughout the week. Future research could attempt to have a varied observation schedule, so that information could be gained about other times of the day, and other days of the week.

**Summary**

This section provided the researcher’s conclusions for the study. Additionally, there was a discussion on the study’s limitations and implications, and recommendations for future research. The researcher concluded that there is a basic level of awareness about SPD among professionals
working in elementary schools in Arkansas, which could be deepened through college coursework and professional developments that specifically target SPD. These findings were in alignment with the literature review that was conducted for this study. There is not as much awareness about SPD as there is in regard to other disorders. Even when professionals are familiar with SPD, they are not sure how to explain it and the characteristics associated with it. The researcher also concluded that there is a degree of interprofessional collaboration being used by educators in Arkansas, but there should be more training on the topic of SPD. There were certain limitations for both the survey and observation aspects within the research. The primary limitation was that most Arkansas educational cooperatives did not respond to the researcher’s request to distribute the survey, so there is a lack of representation in the survey responses. Another main limitation was the observation schedule, which did not allow for the investigator to observe the occupational therapist (OT) on days other than Mondays from 8:30am to 10:45am.
Running head: MEASURING AWARENESS OF SPD AND IPC

References

https://doi.org/10.1044/nnsld12.2.20


https://childmind.org/article/the-debate-over-sensory-processing/

https://childmind.org/article/treating-sensory-processing-issues/


AOTA (2017). *What is the role of the school-based occupational therapy practitioner?*
https://www.aota.org/~media/Corporate/Files/Practice/Children/School-Administrator-Brochure.pdf


https://doi.org/10.1016/j.ridd.2014.11.006


https://doi.org/10.1111/j.1464-0597.2005.00205.x


https://doi.org/10.1007/s10459-022-10128-4


https://doi.org/10.3402/meo.v16i0.6035

https://www.ucsf.edu/news/2013/07/107316/breakthrough-study-reveals-biological-basis
sensory-processing-disorders-kids#:~:text=In%20a%20groundbreaking%20new%20study,apart%20from%20other%20neurodevelopmental%20disorders

Centers for disease control (n.d.) *Autism Spectrum Disorder (ASD).*
https://www.cdc.gov/ncbddd/autism/facts.html


College of Occupational Therapists of Ontario (n.d.) *What occupational therapists (OTs) do.*
https://www.coto.org/you-and-your-ot/what-occupational-therapists-do

https://chlss.org/blog/8-senses-parenting-sensory-processing-disorder/

Children’s Hospital of Richmond (n.d.). *Sensory/social skills: 2 to 12 years.*
https://www.chrichmond.org/services/therapy-services/developmental-milestones/sensory-social-skills-2-to-12-years


Cleveland Clinic (2019). *What happens to your body during the fight or flight response?*
https://health.clevelandclinic.org/what-happens-to-your-body-during-the-fight-or-flight-response/


https://asatonline.org/for-parents/becoming-a-savvy-consumer/is-there-science-behind-that-sensory-diets/


https://doi.org/10.3389/fped.2017.00057


Raver, C.C., Jones, S.M., Li-Grining, C., Zhai, F., Bub, K., Pressler, E. CSRP’s impact on low-income preschoolers’ preacademic skills: Self-regulation as a mediating mechanism.


Ready Bodies, Learning Minds (n.d.). The RBLM program.

https://readybodieslearningminds.com/the-rblm-program/


https://www.additudemag.com/what-is-sensory-processing-disorder/

SMILE Center 2021


STARInstitute (n.d.). Understanding sensory processing disorder.

https://sensoryhealth.org/basic/understanding-sensory-processing-disorder


https://imaginationsoup.net/classroom-strategies-for-sensory-processing-disorder/


https://www.usnews.com/education/k12/arkansas/districts/fayetteville-school-district-109843#:~:text=The%20student%20body%20at%20the,Hawaiian%20or%20other%20Pacific Islander


https://www.usnews.com/education/k12/arkansas/owl-creek-school-237820#:~:text=The %20student%20population%20is%20made,2%20full%20time%20school%20counselors
https://doi.org/10.1186/s12909-020-02286-z


https://apps.who.int/iris/bitstream/handle/10665/70185/WHO_HRH_HPN_10.3_eng.pdf;jsessionid=65A3FB0468EB5873F0FC3DED2DDE8C93?sequence=1
Appendices

Appendix A.1

To:                 Kyra Sampaio Resende
From:               Douglas J Adams, Chair
                    IRB Expedited Review
Date:               01/13/2023
Action:             Exemption Granted
Action Date:        01/13/2023
Protocol #:         2204396950
Study Title:        Measuring awareness of Sensory Processing Disorder and Interprofessional Collaboration & Practices Among Professionals in an Elementary Public School Setting

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc:                 Angela Elsass, Investigator
LETTER AND INFORMED CONSENT
Principal, Owl Creek School

Dear Mr. Brandon Craft, Principal of Owl Creek School:

I am currently a student at the University of Arkansas studying to become a speech-language pathologist. I am also a student in the COEHP Honors Program, and as part of the requirements for the honors program, I am conducting a research study about the awareness of Sensory Processing Disorder (SPD). The objective of this research study is to answer the question, "What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas?"

For this study, I would like to observe how classroom teachers and occupational therapists work with students who have been identified with Sensory Processing Disorder (SPD). Part of my research aligns with interprofessional collaboration and practices between a classroom teacher and occupational therapist to answer the following research questions, "To what degree are interprofessional collaboration and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? and How does awareness of SPD, interprofessional collaboration and interprofessional practices impact supports for students with SPD?" The purpose of this study is to investigate the awareness of SPD among school professionals, to observe the collaboration between classroom teachers and occupational therapists for supporting children with SPD, and to gain knowledge of the practices they use to support these students.

I am excited to observe at Owl Creek Elementary School for this study. The study will include observations of targeted students, collaborative strategies, practices that classroom teachers and occupational therapists use for supporting these students, and to determine effective supports and strategies for academic and behavioral improvement in the classroom setting. I will also be gaining written consent from parents, classroom teachers, and the occupational therapist, to discuss student learning goals and to be apprised of academic and behavioral information, which may include grades, assessment results, school information, IEP, 504, etc. This study has been approved by the University of Arkansas Institutional Review Board, the Fayetteville School District, Director of Assessment, Research & Accountability, Dr. Kelli Dougan, Mr. Craft, and the teacher/education professionals within this study at Owl Creek.

I can only work with your school in my research study with your signed consent. Participation is voluntary, and there are no negative consequences if you choose not to participate. By signing and returning the attached letter, you grant your permission, as principal, for Owl Creek School to be part of this research study and for me to observe the occupational therapist and classroom teachers as they partner in working with identified students who have challenges related to Sensory Processing Disorder. Please note that all information that I collect within this study will be kept confidential and anonymous to the extent allowed by law and University policy. Your school name, names of faculty/staff, and students will not be used in reporting results.

Feel free to contact me or my supervising professor, Dr. Angela Elsass (aelsass@uark.edu) 479.601.2722 with any questions you may have. Thank you for your cooperation.

Sincerely,

Kyra Resende, kresende@uark.edu
University of Arkansas Honors Student, Communication Sciences & Disorders Program
LETTER AND INFORMED CONSENT
Principal, Owl Creek School

Title:
"Measuring Awareness of SPD and Interprofessional Collaboration and Practices Among Professionals in Elementary School Settings."

Researcher:
Kyra Resende, University of Arkansas Honors Student
COEHIP Honors Program, Communication Sciences & Disorders
kresend@uark.edu

University of Arkansas Faculty Supervisor
Dr. Angela Elsas
Honors Faculty Mentor
University of Arkansas
College of Education and Health Professions
Department of Curriculum and Instruction
208 Peabody Hall
Fayetteville, AR 72701-1201
479-575-5492 office/ 479-601-2722 cell
nelsas@uark.edu

Compliance Contact Person:
Ro Windwalker
Compliance Coordinator
University of Arkansas
Research Integrity & Compliance
105 MLKG Building
Fayetteville, AR 72701-1201
479.575.2208, irb@uark.edu

Description:
The objective of this research study is to answer these questions, "What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas? To what degree are interprofessional collaboration and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? and How does awareness of SPD, interprofessional collaboration and interprofessional practices impact supports for students with SPD?" This study will investigate the awareness of Sensory Processing Disorder (SPD) among school professionals, and the interprofessional collaboration between classroom teachers and occupational therapists for supporting children with SPD. The study will be at Owl Creek Elementary School in the Fayetteville School District, Northwest Arkansas and have a duration of approximately 6-8 weeks during the Spring 2023 semester.

The occupational therapist and classroom teacher at Owl Creek School will voluntarily participate in interprofessional collaboration with the researcher through debriefing of student observations to assist in helping the researcher understand the strategies used with students who have SPD during this research study. With written consent, other academic and behavioral information data such as grades, assessment results, IEP, 504, and school records/information, may be discussed in alignment to the student’s progress. This data and student observations in the school setting will serve as a way for the researcher to gain knowledge about strategies that support students with SPD. A Sensory Processing Disorder Handbook for Professionals in the Elementary Public School Setting will be developed by the researcher, using the data collected from classroom observations, and distributed to the participants.

Risks and Benefits: There are no risks, other than those associated with regular classroom instruction and occupational therapy, anticipated with this project. The potential benefits include improved collaboration between the classroom teacher and the occupational therapist for sharing
LETTER AND INFORMED CONSENT
Principal, Owl Creek School

Voluntary Participation: The classroom teacher and occupational therapist will voluntarily participate in interprofessional collaboration and will debrief with the researcher after observations to assist in helping the researcher understand the strategies used with students who are challenged with SPD during this research study. This will not interfere with regular classroom instruction or occupational therapy. There are no costs, rewards, or negative consequences if you choose not to participate in this study.

Confidentiality: All information will be kept secure and maintained confidential to the extent allowed by applicable State and Federal law and University policy. Confidentiality will be assured by the researcher through the establishment of a code. Each targeted teacher-student-occupational therapist team will be assigned a number at random to establish the code. All data will be recorded and reported anonymously using the code. Only the researcher will have access to the code, and all data will be kept in a secure location or data file. Upon completion of the study, the code will be destroyed. Names of participating schools/districts will be included in the final report.

Right to Withdraw: There will be no negative consequences if you choose now, or at any time, for any reason, to withhold or withdraw from your participation in this study. There are no negative consequences for this decision.

Informed Consent

I have read the description, I understand the purpose of this research study, the focus of the awareness of Sensory Processing Disorder (SPD), any potential risks and benefits, how confidentiality will be established and maintained, as well as the option to withdraw.

My signature below indicates that I freely agree to the interprofessional collaboration, student observations, and discussion of identified students with SPD, in order to assist the researcher in understanding effective strategies for students who are challenged with SPD during this research study. I willingly agree for my school, Owl Creek, to participate in this research study.

[Signature]

Signature of School Principal

[Signature]

School

[Signature]

Date

Please print your name on the line above.
Dear Ms. Devin Horan, Occupational Therapist:

I am currently a student at the University of Arkansas studying to become a speech-language pathologist. I am also a student in the COEHP Honors Program, and as part of the requirements for this program, I am conducting a research study about the awareness of Sensory Processing Disorder (SPD). The objective of this research study is to answer the research questions, "What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas?"

I would like to observe you working with students who have been identified with Sensory Processing Disorder. Part of my research aligns with the collaboration and practices between an occupational therapist and the classroom teacher, in order to answer the following research questions, "To what degree are interprofessional collaboration and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? And how do awareness of SPD, interprofessional collaboration and interprofessional practices impact supports for students with SPD?" The purpose of this study is to investigate the awareness of SPD among school professionals, and the collaboration between occupational therapists and classroom teachers, as well as strategies and practices used for supporting children with SPD.

I am excited to observe at Owl Creek Elementary School for this study. The study will include observations of targeted students, your collaborative strategies with the classroom teacher(s) for supporting these students, and to determine effective supports and strategies for academic and behavioral improvement that the occupational therapist and teacher use in the classroom setting. I will be gaining consent from parents and the classroom teacher(s), in order to discuss learning goals and be apprised of academic and behavioral information; such as, grades, assessment results, school information, IEP, 504, etc. I have also gained approval from the University of Arkansas Institutional Review Board, the Fayetteville School District, Mr. Craft, and the classroom teacher for this research study at Owl Creek.

I can only work with you in my research study with your signed consent. Participation is voluntary, and there are no negative consequences if you choose not to participate. By signing and returning the attached form, you grant permission to be part of this research study and for me to observe you as you work with students who have been identified as having challenges related to Sensory Processing Disorder. Please note that all information will be kept confidential and anonymous to the extent allowed by law and University policy. Names will not be used in reporting results.

The attached informed consent form contains a more detailed description of this project. Please take time to read it carefully. Feel free to contact me or my U of A supervising professor, Dr. Angela Elsas (aelsass@uark.edu) 479.601.2722 with any questions you may have. Thank you for your cooperation.

Sincerely,

Kyra Resende, kresende@uark.edu
University of Arkansas Honors Student, Communication Sciences & Disorders Program
Attachment 4

LETTER AND INFORMED CONSENT
Occupational Therapist

Title:
“Measuring Awareness of SPD and Interprofessional Collaboration and Practices Among Professionals in Elementary School Settings.”

Researcher:
Kyla Resende, University of Arkansas Honors Student
COEHP Honors Program, Communication Sciences & Disorders
kresende@uark.edu

University of Arkansas Faculty Supervisor
Dr. Angela Elsass
Honors Faculty Mentor
University of Arkansas
College of Education and Health Professions
Department of Curriculum and Instruction
208 Peabody Hall
Fayetteville, AR 72701-1201
479-575-5492 office/ 479-601-2722 cell
aelss@uark.edu

Compliance Contact Person:
Ro Windwalker
Compliance Coordinator
University of Arkansas
Research Integrity & Compliance
109 MLKG Building
Fayetteville, AR 72701-1201
479.575.2208
irb@uark.edu

Description:
The objective of this research study is to answer these questions, “What is the level of awareness of sensory processing disorder (SPD) among professionals in an elementary school setting in Arkansas? To what degree are interprofessional collaboration and interprofessional practices (IPP) used while working with a child who experiences SPD in an elementary school setting? and How do awareness of SPD, interprofessional collaboration and interprofessional practices impact supports for students with SPD?” This study will investigate the awareness of Sensory Processing Disorder (SPD) among school professionals, and the interprofessional collaboration between classroom teachers and occupational therapists for supporting children with SPD. The study will be at Owl Creek Elementary School in the Fayetteville School District, Northwest Arkansas. The study will have a duration of approximately 6-8 weeks during the Fall 2022 and Spring 2023 semesters.

The occupational therapist and classroom teacher will voluntarily participate in interprofessional collaboration with the researcher through debriefing of observations to assist in helping the researcher understand the strategies used with students who are challenged with SPD during this research study. Observations in the school setting will serve as a way for the researcher to gain strategies that support students with SPD. A Sensory Processing Disorder Handbook for Professionals in the Elementary Public School Setting will be developed by the researcher, using the data collected from classroom observations and distributed to the participants.
LETTER AND INFORMED CONSENT
Occupational Therapist

Risks and Benefits: There are no risks, other than those associated with regular occupational therapy and classroom instruction anticipated with this project. The potential benefits include improved collaboration between the occupational therapist and classroom teacher on shared goals and improved supports for the targeted student(s).

Voluntary Participation: The occupational therapist will voluntarily participate in interprofessional collaboration with the classroom teacher and the researcher through debriefing of observations to assist in helping the researcher understand the strategies used with students who are challenged with SPD during this research study. This will not interfere with occupational therapy or regular classroom instruction. There are no costs, rewards, or negative consequences if you choose not to participate in this study.

Confidentiality: All information will be kept secure and maintained confidential to the extent allowed by applicable State and Federal law and University policy. Confidentiality will be assured by the researcher through the establishment of a code. Each targeted teacher-student team will be assigned a number at random to establish the code. All data will be recorded and reported anonymously using the code. Only the researcher will have access to the code, and all data will be kept in a secure location or data file. Upon completion of the study, the code will be destroyed. Names will not be include in the final research report.

Right to Withdraw: There will be no negative consequences if you choose now, or at any time, for any reason, to withhold or withdraw from your participation in this study. There are no negative consequences for this decision. If you have questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University’s IRB Coordinator, at 479.575.2208 or irb@uark.edu.

Informed Consent

I have read the description. I understand the purpose of this research study, the focus of the awareness of Sensory Processing Disorder (SPD), any potential risks and benefits, how confidentiality will be established and maintained, as well as the option to withdraw.

My signature below indicates that I freely agree to be observed and to assist in helping the researcher understand the strategies used with students who are challenged with SPD during this research study. I willingly agree to serve as a participant in this research study.

[Signature]
Devin Horan

Signature of Occupational Therapist
School
Date
12/05/22

Please print your name on the line above.
Greetings:

My name is Kyra Sampao Resende. I am a senior honors student at the University of Arkansas, Fayetteville and I am conducting a research project on Sensory Processing Disorder (SPD) in Arkansas elementary school settings. The name of my project is “Measuring Awareness of SPD Among Professionals in an Elementary School Setting.” For my research study, I am creating a survey with questions about knowledge and perceptions in regard to the awareness of Sensory Processing Disorder and would like to distribute this survey to the principals, classroom teachers, special education teachers, speech therapists, and occupational therapists in Arkansas schools. The survey is an important part of my research and will help me understand the scope of SPD awareness in Arkansas.

The participation for this survey is voluntary and the professionals who participate and choose to share their contact information will receive a Sensory Processing Disorder Handbook that I am designing as part of the requirements for my research. I would like to ask if there is a possibility that this survey could be distributed through your listserve to participants in the school districts of your cooperative region? If this is not a possibility, would you have any suggestions for acquiring the contact information for principals, classroom teachers, special education teachers, speech pathologists and occupational therapists in your cooperative region. I have attached a copy of the survey for your review. I will await your response to determine if distribution of the survey through your cooperative is a possibility.

I look forward to hearing from you regarding your answer or to address any questions or concerns. I will be happy to share the results of my study with you upon completion. My email contact information is kresende@uark.edu and my cell phone is 479.402.9423. My mentor for this honors research study is Dr. Angela Elsass, Associate Professor of Teaching. She is a faculty member in the K-6 Teacher Preparation Program. Her contact is aelsass@uark.edu.

Thank you,

Kyra Sampao Resende  
Student in the College of Education & Health Professions Honors Program, Communication Sciences & Disorders  
University of Arkansas, Fayetteville Campus  
kresende@uark.edu

Angela Elsass, Ed.D., Associate Professor of Teaching  
K-6 Teacher Preparation Program, Department of Curriculum & Instruction  
College of Education & Health Professions, University of Arkansas, Fayetteville Campus  
208 Peabody Hall, (479) 601-2722, aelsass@uark.edu
Appendix B.

I understand that my participation is voluntary and that refusing to participate will not adversely affect any other relationship with the University or the researchers.

- Yes
- No

I understand that my participation and answers will be kept confidential and anonymous to the extent allowed by law and university policy.

- Yes
- No
Which cooperative region serves your school district?

- Arch Ford Education Service Cooperative
- Arkansas River Education Service Cooperative
- Crowley’s Ridge Education Cooperative
- Dawson Education Service Cooperative
- Dequeen/Mena Education Cooperative
- Great Rivers Education Service Cooperative
- Guy Fenter Education Service Cooperative
- Northcentral Arkansas Education Cooperative
- Northeast Arkansas Education Cooperative
- Northwest Arkansas Education Co
- Ozark Unlimited Resource Cooperative
- South Central Service Co
- Southeast Arkansas Education Service Co
- Southwest Arkansas Education Co
- Wilbur D. Mills Education Co

What is your profession?

- Principal
- Classroom Teacher
- Speech-Language Pathologist
- Special Education Teacher
- Occupational Therapist
- Other...
How many years have you been in your profession?

- Less than 1 year
- 1 to 3 years
- 4 to 7 years
- 8 to 11 years
- 12 to 15 years
- 16 to 20 years
- Over 20 years

Do you speak two or more languages? If yes, please list which language(s). If no, write NA.

Short answer text
..............................................................................................................

I am a member of a professional organization such as, but not limited to, the National Association for the Education of Young Children, the National Education Association, the American Psychology Association, etc.

If yes, please list which professional organization, if no, write NA.

Short answer text
..............................................................................................................
I have taken college coursework relating to children with special needs and/or developmental delays.

- [ ] Yes
- [ ] No

I have taken college coursework relating to children with special needs that specifically addressed the topic of Sensory Processing Disorder or Sensory Integration Dysfunction.

- [ ] Yes
- [ ] No

I have taken college coursework relating to children with special needs that specifically addressed the topic of behavior disorders.

- [ ] Yes
- [ ] No
I have attended professional trainings, such as workshops, conferences, or seminars relating to children with special needs and/or developmental delays.

- Yes
- No

I have attended professional trainings, such as workshops, conferences, or seminars relating to children with special needs that specifically addressed Sensory Processing Disorder.

- Yes
- No

I have attended professional trainings, such as workshops, conferences, or seminars relating to children with special needs that specifically addressed behavior disorders.

- Yes
- No

I feel confident in my ability to recognize behavior that may indicate Autism Spectrum Disorder.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
</table>
| Lowest | | | | | | Highest
I feel confident in my ability to recognize behavior that may indicate Sensory Processing Disorder.

1  2  3  4  5

Lowest  ○  ○  ○  ○  ○  Highest

I feel confident in my ability to recognize behavior that may indicate Attention Deficit Hyperactive Disorder.

1  2  3  4  5

Lowest  ○  ○  ○  ○  ○  Highest

I feel confident in my ability to recognize behavior that may indicate Speech Deficits or Delays.

1  2  3  4  5

Lowest  ○  ○  ○  ○  ○  Highest
I feel confident in my ability to recognize behavior that may indicate other disorders

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I have heard about Sensory Processing Disorder or Sensory Integration Dysfunction

- Yes
- No

I am familiar with what Sensory Processing Disorder is

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

I know how to identify the signs of Sensory Processing Disorder

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
I have worked with students who have Sensory Processing Disorder

☐ Yes
☐ No

I am aware of strategies that I can use to help students who have Sensory Processing Disorder

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

I have implemented strategies in my classroom to help students who have Sensory Processing Disorder

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly disagree

If I had to, I would be able to explain what Sensory Processing Disorder is

☐ Strongly agree
☐ Agree
☐ Neutral
☐ Disagree
☐ Strongly Disagree
My program has a formalized protocol for referring students with significant behavioral needs when needed

☐ Yes

☐ No

☐ Not sure

☐ Does not apply

I have had the opportunity to provide information to families in support of acquiring intervention for

☐ Speech delays

☐ Hearing problems

☐ Sensory Processing Disorder

☐ Attention Deficit Disorder

☐ Autism Spectrum Disorder

☐ I have not had the opportunity

☐ Other...
Check any of the topics that you have read or heard about prior to this survey (indicate all that apply):

- Attention Deficit Disorder
- Autism Spectrum Disorder
- Sensory Processing Disorder
- Asperger syndrome
- Sensory integration dysfunction
- Fetal alcohol syndrome
- Fragile x syndrome
- Dyslexia
- Dysgraphia
- Zone of proximal development
- Sensitive period of development
- Piaget’s stages of development
- Proprioception
- Interoception

Which of the following resources are you aware of or you have read about Sensory Processing Disorder (indicate all that apply):

- The Out-of-Sync Child
- Sensational Kids
- Sensory Integration and the Child
- Diagnostic and Statistical Manual-IV (DSM-IV)
- Early Childhood Environment Rating Scale
- No, but I’ve heard of at least one of them
Which of the following that have had some level of influence on your awareness or understanding of Sensory Processing Disorder (indicate all that apply)

☐ Reading books of choice
☐ Reading books for a class/coursework
☐ Attending Professional Workshops
☐ Knowing someone with Sensory Processing Disorder
☐ Internet Research
☐ Knowing someone with special needs or behavioral challenges
☐ Personal experiences at work, such as conversations with a colleague
☐ Other
I know what Inter-professional Collaboration is

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Strongly disagree   | Strongly agree

I know the benefits of Inter-professional Collaboration

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Strongly disagree   | Strongly agree

I have received training in Inter-professional Education.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Strongly disagree   | Strongly agree

I collaborate with other professionals in the school to improve the intervention of a student with special needs.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Strongly disagree   | Strongly agree
Inter-professional practices are a consistent part of my day-to-day work responsibilities

1 2 3 4 5
Strongly disagree  ☐  ☐  ☐  ☐  ☐  Strongly agree

I am qualified and comfortable identifying SPD in a student

☐ Yes
☐ No

What type of assessment procedures for SPD are used in your school?

☐ Screenings
☐ Standardized testing
☐ Observations
☐ Parent-report measures
☐ Other...
What are the senses affected by sensory processing disorder?

- Vision
- Audition
- Olfaction
- Gustation
- Tactician
- Vestibular
- Proprioception
- All of them
What are the symptoms for SPD?

- Over-responsiveness
- Distracted and fidgety
- Avoidant
- “Thrill seeking”
- Constant need to touch people or textures
- Poor balance and uncoordinated movements
- Under-responsiveness
- Extremely high or low pain tolerance
- All of the above

All students with behavior issues are identified as having sensory needs.

- Yes
- No

Please briefly share your knowledge about a what a Sensory Diet is

Long answer text

Have you had to talk to a parent about their child possibly having Sensory Processing Disorder? If so, how did you have this conversation with the student's guardians?

Long answer text
Appendix C.

I understand that my participation is voluntary and that refusing to participate will not adversely affect any other relationship with the University or the researchers.
48 responses

I understand that my participation and answers will be kept confidential and anonymous to the extent allowed by law and university policy.
47 responses
Do you speak two or more languages? If yes, please list which language(s). If no, write NA.

48 responses

I am a member of a professional organization such as, but not limited to, the National Association for the Education of Young Children, the National Ed...t which professional organization, if no, write NA.

47 responses
I have taken college coursework relating to children with special needs and/or developmental delays.
48 responses

- Yes: 89.6%
- No: 10.4%

I have taken college coursework relating to children with special needs that specifically addressed the topic of Sensory Processing Disorder or Sensory Integration Dysfunction.
48 responses

- Yes: 75%
- No: 25%
I have taken college coursework relating to children with special needs that specifically addressed the topic of behavior disorders.
47 responses

- Yes: 63.8%
- No: 36.2%

I have attend professional trainings, such as workshops, conferences, or seminars relating to children with special needs and/or developmental delays.
47 responses

- Yes: 83%
- No: 17%
I have attended professional trainings, such as workshops, conferences, or seminars relating to children with special needs that specifically addressed Sensory Processing Disorder.

47 responses

- Yes: 57.4%
- No: 42.6%

I have attended professional trainings, such as workshops, conferences, or seminars relating to children with special needs that specifically addressed behavior disorders.

48 responses

- Yes: 25%
- No: 75%
I feel confident in my ability to recognize behavior that may indicate Autism Spectrum Disorder. 48 responses

I feel confident in my ability to recognize behavior that may indicate Sensory Processing Disorder. 48 responses
I feel confident in my ability to recognize behavior that may indicate Attention Deficit Hyperactive Disorder.

48 responses

I feel confident in my ability to recognize behavior that may indicate Speech Deficits or Delays

48 responses
I feel confident in my ability to recognize behavior that may indicate other disorders
47 responses

I have heard about Sensory Processing Disorder or Sensory Integration Dysfunction
48 responses
I am familiar with what Sensory Processing Disorder is
47 responses

I know how to identify the signs of Sensory Processing Disorder
48 responses

I have worked with students who have Sensory Processing Disorder
48 responses
I am aware of strategies that I can use to help students who have Sensory Processing Disorder
48 responses

I have implemented strategies in my classroom to help students who have Sensory Processing Disorder
48 responses

If I had to, I would be able to explain what Sensory Processing Disorder is
48 responses
My program has a formalized protocol for referring students with significant behavioral needs when needed
48 responses

I have had the opportunity to provide information to families in support of acquiring intervention for
47 responses

- Speech delays: 25 (53.2%)
- Hearing problems: 17 (36.2%)
- Sensory Processing Disorder: 11 (23.4%)
- Attention Deficit Disorder: 26 (55.3%)
- Autism Spectrum Disorder: 23 (48.9%)
- I have not had the opportunity: 14 (29.8%)
- Dyslexia: 1 (2.1%)
- Emotional Disturbances and VI...: 1 (2.1%)
- As related to referrals, evaluati...: 1 (2.1%)
Check any of the topics that you have read or heard about prior to this survey (indicate all that apply):

- Attention Deficit Disorder: 46 (97.9%)
- Autism Spectrum Disorder: 47 (100%)
- Sensory Processing Disorder: 39 (83%)
- Asperger syndrome: 44 (93.6%)
- Sensory integration dysfunction: 14 (29.8%)
- Fetal alcohol syndrome: 43 (91.5%)
- Fragile x syndrome: 16 (34%)
- Dyslexia: 47 (100%)
- Dysgraphia: 38 (80.9%)
- Zone of proximal development: 16 (34%)
- Sensitive period of development: 40 (85.1%)
- Piaget's stages of development: 40 (85.1%)
- Proprioception: 11 (23.4%)
- Interoception: 9 (19.1%)

Which of the following resources are you aware of or you have read about Sensory Processing Disorder (indicate all that apply):

- The Out-of-Sync Child: 6 (14.3%)
- Sensational Kids: 4 (9.5%)
- Sensory Integration and the Child: 3 (7.1%)
- Diagnostic and Statistical Manual-IV (DSM-IV): 15 (35.7%)
- Early Childhood Environment Rating Scale: 9 (21.4%)
- No, but I've heard of at least one of them: 22 (52.4%)
Which of the following that have had some level of influence on your awareness or understanding of Sensory Processing Disorder (indicate all that apply)

48 responses

- Reading books of choice: 15 (31.3%)
- Reading books for a class/course: 14 (29.2%)
- Attending Professional Workshop(s): 23 (47.9%)
- Knowing someone with Sensor Processing Disorder: 19 (39.6%)
- Internet Research: 18 (37.5%)
- Knowing someone with special needs: 29 (60.4%)
- Personal experiences at work: 31 (64.6%)
- Other: 1 (2.1%)
- Does not apply: 10 (20.8%)

Which of the following that have had some level of influence on your awareness or understanding of Sensory Processing Disorder (indicate all that apply)

48 responses

- Reading books of choice: 15 (31.3%)
- Reading books for a class/course: 14 (29.2%)
- Attending Professional Workshop(s): 23 (47.9%)
- Knowing someone with Sensor Processing Disorder: 19 (39.6%)
- Internet Research: 18 (37.5%)
- Knowing someone with special needs: 29 (60.4%)
- Personal experiences at work: 31 (64.6%)
- Other: 1 (2.1%)
- Does not apply: 10 (20.8%)
I know what Inter-professional Collaboration is
48 responses

<table>
<thead>
<tr>
<th>Score</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>12.5%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>18.8%</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>29.2%</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>37.5%</td>
</tr>
</tbody>
</table>

I know the benefits of Inter-professional Collaboration
48 responses

<table>
<thead>
<tr>
<th>Score</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>14.6%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>18.8%</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>33.3%</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>33.3%</td>
</tr>
</tbody>
</table>
I have received training in Inter-professional Education.
48 responses

I collaborate with other professionals in the school to improve the intervention of a student with special needs.
48 responses
At my work environment, there is a focus on Inter-professional Collaboration
47 responses

Inter-professional practices are a consistent part of my day-to-day work responsibilities
47 responses
I am qualified and comfortable identifying SPD in a student
48 responses

- Yes: 83.3%
- No: 16.7%

What type of assessment procedures for SPD are used in your school?
44 responses

- Screenings: 22.7%
- Standardized testing: 18.2%
- Observations: 11.4%
- Parent-report measures: 11.4%
- All of the above: 10.9%
- Unknown: 5.9%
- NA: 5.9%
- Observations, parent-report measures: 3.6%

1/3 ▼
What are the senses affected by sensory processing disorder?

42 responses

- Vision: 10 (23.8%)
- Audition: 9 (21.4%)
- Olfaction: 7 (16.7%)
- Gustation: 3 (7.1%)
- Tactician: 6 (14.3%)
- Vestibular: 6 (14.3%)
- Proprioception: 4 (9.5%)
- All of them: 36 (85.7%)

What are the symptoms for SPD?

44 responses

- Over-responsiveness: 9 (20.5%)
- Distracted and fidgety: 8 (18.2%)
- Avoidant: 8 (18.2%)
- "Thrill seeking": 6 (13.6%)
- Constant need to touch people: 7 (15.9%)
- Poor balance and uncoordinated: 6 (13.6%)
- Under-responsiveness: 8 (18.2%)
- Extremely high or low pain tolerance: 7 (15.9%)
- All of the above: 40 (90.9%)
All students with behavior issues are identified as having sensory needs.
48 responses

91.7% Yes
8.3% No

Please briefly share your knowledge about a what a Sensory Diet is

40 responses

<table>
<thead>
<tr>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
</tr>
<tr>
<td>na</td>
</tr>
</tbody>
</table>

A sensory diet can be created through an occupational therapy evaluation to determine sensory needs and if a student may be sensory seeking, sensory avoidance, or a mix. A diet is created specifically for that student based on the sensory integration needs. It is a group of activities such as dry brushing, jumping, bouncing, other “hard work” activities, touch-based, and many other activities to meet that child’s sensory needs to help re-regulate their system and increase calmness, attention, and response abilities.

A sensory diet is a way of determining what sensory input needs a student requires in order to be productive.

Sensory diets are tailored to the child’s needs and have elements that can be easily incorporated into a child’s routine.
I am unaware what a Sensory Diet is.

I am not sure but I believe it may be out the ability to have a strong sense of daily activities

A program that gets a student with SPD what he/she needs to function.

We incorporate brain breaks, chill station, sensory toys, visual input, gross motor skills and sensory walk throughout the day at intervals along with joint compressions and cancellation headphones along with light dimness to give them a balanced diet throughout the day.

Having a student uses their 5 senses during activities

A sensory diet is a specified plan of activities designed for a particular student that helps them integrate themselves back to calm and focus. Some activities include relaxing a student that is angry or upset, while other activities involve activity and movement for those who are unable to concentrate and focus.

I know that it is important to allow the student to have access to different materials and objects that help them meet their sensory needs.

Different modalities of sensory input.

Using sensory type activities or repetitive movements for a period of time

I am not sure.

Not entirely sure. I imagine it is the sensory input a student needs in order to be successful.

It's a diet where students get the nutrients needed to fuel them in a positive way that helps with their disorder.

a program of sensory activities that kids perform during the day to ensure they're getting the input their bodies need

Unsure

A sensory diet is a way to make sure that students are getting the input they need everyday.
I have no idea.

I have heard of this but I am not familiar with foods on these types of diets.

Sensory activities planned throughout the day according to a child’s needs

Things that some students need to accommodate their SPD and help them navigate comfortably

Using tools such as chewing gum, brushing, tactile sensory items, swinging, exercising, weighted vests

No idea

Planning/programming for regular sensory input for an individual.

This is something used when students have sensitivities to certain foods.

Having access to sensory tools to help aide in the integration of learning and inclusion within the special education and general education settings

Parent, OT, PT, Speech, SpEd, Gen Ed. all collaborate to identify needs/stimuli/triggers for individual students based on observations and student input (when possible) to create activities and schedules that address various sensory needs.

A schedule to be completed by an individual that provides needed sensory input (or break from) to assist with regulation throughout the day or night.

Food or liquid textures, smells...

Accommodating to what the child is needing to help facilitate their day.

N/a

I don’t know a lot about this but assume it has to do with a diet created to work around food avoidance or slowly increasing food exposure or “safe foods”
Have you had to talk to a parent about their child possibly having Sensory Processing Disorder? If so, how did you have this conversation with the student’s guardians?

41 responses

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td></td>
</tr>
<tr>
<td>no</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

I had this conversation based on observations and input that had been provided by the teacher and parent. I provided the teacher with resources that gave the parent additional knowledge on the topic and usually had this conversation with an occupational therapist present.

| N/A |   |

yes—Invited other professionals in the school who knew more than me about SPD to the face-to-face convo to assist parent understanding and school recommendations.

| Yes, I have discussed and given suggestions to parents for years about SPD. |   |
| Yes. |   |
No, we are not allowed to suggest issues such as this with our student’s parents. I have recognized it multiple times and I bring up certain sensitivities with parents. However, I am not allowed to suggest to a parent that their child has SPD.

I understand the importance of listening and applying suggested Sensory Diet needs.

No, I do not feel qualified to say that; I have not worked with anyone diagnosed with that.

I have never had to address this with any specific students except my own child.

I have not ever had to speak to a parent about their student having Sensory Processing Disorder.

Typically, by fifth grade, parents are aware of the disorder and conversations with teachers have already taken place. My conversations are about what type of tools work best with their student.

No I have not.

Talked with parents through an IEP meeting and gave them tools and ideas to help them at home too.

No I have not.

Talked with parents through an IEP meeting and gave them tools and ideas to help them at home too.

Over the years, yes, I have talked to/with parents about sensory needs. If evaluation data is present to identify Sensory Processing Disorder there is typically a plan to support needs. Being in middle school, most of the initial referrals or needs have already been referred at an earlier age. How we implement sensory needs evolves as the child matures or as settings change. Most of my work with SPD is addressed through IEP teams.

During conferences for programming and planning. Typically in person. We do not discuss sensory processing disorder as a diagnosis but discuss sensory needs and responses as they relate to the child’s day. I do not diagnose.

I have not had a conversation with parents about their child possibly having SPD.

Yes, starting by naming observations and seeking to see if they have seen the same things. Then moved into how do you think this is impacting your kiddo and what can we do to support him/her.
Appendix D.

SENsory PROCESSing DISORDER (SPD)

What is SPD?
- SPD is a neurological condition in which the brain has trouble receiving and responding to information coming in through the senses.
- This means that a person with SPD may have difficulty processing and responding to sensory stimuli.
- SPD can affect how a person perceives and reacts to their environment.
- People with SPD may have heightened or exaggerated responses to sensory stimuli, which can make it difficult for them to interact with their environment.

What's not SPD?
- SPD is not a matter of being clumsy.
- SPD is not about not being able to concentrate.
- SPD is not about having a hard time understanding social norms.
- SPD is not about having a hard time understanding time or space.
- SPD is not about having a hard time understanding language.

The DOs and DON'Ts
- DO give the student support, especially when they're having trouble.
- DON'T tell the student to stop having trouble.
- DO give the student access to strategies.
- DON'T give the student access to strategies.

Strategies
- Sensory input and output.
- Sensory activities in the classroom.
- Sensory activities outside the classroom.
- Social-cognitive interventions.
- Emotional regulation.
- Sensory processing at home.
- Sensory processing at school.

References
- strategiesmind.inclusivelearning.org.
- sensoryprocessing.org.
- karen.samuels@uark.edu.
- University of Arkansas.

Kera Samuelson
ksamuels@uark.edu

Running head: MEASURING AWARENESS OF SPD AND IPC
## 2022 SURF Award Notice

**NAME:** Kyra Resende  
**FACULTY MENTOR:** Dr. Angela Elsass  
**INSTITUTION:** University of Arkansas-Fayetteville

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student's Costs from SURF</td>
<td>$1250</td>
</tr>
<tr>
<td>Mentor's Costs from SURF</td>
<td>$750</td>
</tr>
<tr>
<td>Student's Travel Costs from SURF</td>
<td>$750</td>
</tr>
<tr>
<td><strong>TOTAL SURF GRANT AWARD:</strong></td>
<td><strong>$2750</strong></td>
</tr>
<tr>
<td>University Match</td>
<td>$1250</td>
</tr>
</tbody>
</table>

Congratulations! You have been awarded the Student Undergraduate Research Fellowship (SURF) Grant for 2022, with payments indicated above.

If any of the information above appears incorrect, please let me know before accepting.

By signing this award notice, you agree to conduct in-depth research in the field of study indicated on your 2022 SURF Grant application under the supervision of your mentor. Additionally, you agree to present your research at a state or national conference in your discipline or attend a meeting of experts in your discipline as directed by your mentor.

Finally, you are required to submit a one-page abstract of the findings of your research to the Arkansas Division of Higher Education as follows:
- **May 2022 Graduates by May 1, 2022**
- **Summer 2022 Graduates by August 1, 2022**
- **December 2022 Graduates by December 1, 2022**

Please sign this award notice to accept or decline the award and return it to the Arkansas Division of Higher Education by **December 31, 2021**. It can be mailed back to the address above, faxed to 501-371-2001 or emailed to quinton.morgan@adhe.edu.

**CHECK ONE:**
- [ ] I ACCEPT THE STUDENT UNDERGRADUATE RESEARCH FELLOWSHIP.  
- [ ] I DECLINE THE STUDENT UNDERGRADUATE RESEARCH FELLOWSHIP.

____________________________  ________________________
**Signature of Recipient**  **Date**