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# Can sensory strategies reduce tantruming to increase positive familial interactions?

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**CAN SENSORY STRATEGIES REDUCE TANTRUMING TO INCREASE POSITIVE  
FAMILIAL INTERACTIONS?**

by  
Deborah Stacy Maule

A Thesis

Submitted to the  
Department of Interdisciplinary and Inclusive Education  
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Thesis Chair: S. Jay Kuder, Ed. D.

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## **Dedications**

My husband of 21 years, Jimmie Maule, started a new business right before I began Graduate School which was also the same time our eldest daughter went to college. It was his way of trying something new for the betterment of our family, a grand gesture that he would work hard day and night to help our family get ahead of the financial crisis that we were in. Although Graduate School was very expensive, this insightful man knew that it was my dream to achieve a higher level of education, and he pushed me to start the most wonderful, difficult, and awe-inspiring journey that has brought me more self-reflection and enjoyment than I could ever have anticipated. Thank you, Jimmie, and thank you to my super star daughters, Hally and Madeleine Maule (and my dog Kinaeda), who patiently did their homework along with me, helping me to reach new heights as a student. Hopefully I set good example in the process. I love you.

## **Acknowledgments**

It has meant the world to me to be able to tell others about the importance of sensory integration and management within the scope of this thesis. She doesn't know it, but one of my family members, was my inspiration for learning as much as I could about people with special needs. I always wanted to know how to help her without her getting upset. Through many years of research, I have been able to help a myriad of other children with similar struggles through the implementation of the sensory strategies and processes described within this thesis. Because of these strategies, many children have been afforded increased shared familial engagement because their family members know how to soothe their child or children instead of reacting to their tantrums. Thank you also to my Early Intervention families, their children, and my Early Intervention Team who have taught me so much about the importance of each and every important learning moment over the years. Thank you to Dr. S. Jay Kuder, Nanci Paparo, and my parents and brother for your unwielding support throughout this process.

## **Abstract**

Deborah S. Maule

**CAN SENSORY STRATEGIES REDUCE TANTRUMING TO INCREASE POSITIVE  
FAMILIAL INTERACTIONS?**

2016-2017

S. Jay Kuder, Ed.D.

Master of Arts in Learning Disabilities

This study examined the effects of sensory strategies in relation to a child's success in regards to enjoyment of his or her family life. This study was based on the sensory struggles of one little boy who spent much of his time tantruming. This was possibly due to his inability to self-calm so that he could find success instead of strife within his home environment.

This study took place over fifteen Early Intervention home visits in southern New Jersey, and parental questionnaires were referenced each time to note progress or regression in areas pertinent to the child's social emotional and sensory success. Because the home was not a regulated environment, varying effects were possible throughout this study. The child's mother and younger brother were present for all sessions, and on some occasions, an extraneous visitor.

The child was 28 months through 32 months of age by the end of the study. He initially presented as extremely dysregulated, and sensory strategies were used and kept track of, in order to later reference what was working, and what was not. As evidenced by zero tantrums during our last visit, the sensory strategies proved their efficacy by the end of the study, when implemented as needed.

## Table of Contents

|  |     |
|--|-----|
| Abstract .....   | v   |
| List of Figures .....  | vii |
| Chapter 1: Introduction .....  | 1   |
| Chapter 2: Literature Review .....                                     | 6   |
| Sensory Issues in Children with Autism .....                           | 6   |
| Efficacy of Sensory Integration Therapy for Children with Autism ..... | 7   |
| Conclusion .....   | 18  |
| Chapter 3: Methodology .....   | 20  |
| Subject.....   | 20  |
| Instruments.....   | 22  |
| Intervention .....   | 25  |
| Chapter 4: Results .....   | 28  |
| Individual Results .....   | 29  |
| Chapter 5: Discussion .....  | 46  |
| Review .....   | 46  |
| Limitations .....  | 48  |
| Implications for Practice .....  | 48  |
| Future Studies .....   | 49  |
| Conclusion .....   | 49  |
| References.....  | 51  |

## List of Figures

| Figure   | Page |
|--|------|
| Figure 1. Tantrums Per Early Intervention Visit. ....  | 30   |
| Figure 2. Difficulty with Engagement (Tantruming) During Preferred Activities. ....  | 31   |
| Figure 3. Frequency of the Child Looking or Responding When His Name was Called. ....  | 32   |
| Figure 4. Tantrums When Presented with a Non-Preferred Activity or Occurrence. ....  | 33   |
| Figure 5. Used Words, Pictures, Signs, Sounds, and/ or a Purposeful Point Prior to Tantruming to Gain Attention or to Ask for Help. .... | 34   |
| Figure 6. Frequency of Appropriate Eye Contact Given. ....   | 35   |
| Figure 7. The Child Tried to Gain Parental Attention Toward Something of Interest. ....  | 36   |
| Figure 8. Enjoyed Hugs, Cuddles, or Affectionate Touch with Parent or Caregiver. ....  | 37   |
| Figure 9. Frequency of the Child's Engagement in Messy Play During Early Intervention Home Visits ....                                   | 38   |
| Figure 10. Distractions by Noisy Environments as Reported per Date, Possibly Causing Difficulty with Attention and Focus. ....           | 41   |
| Figure 11. The Child's Ability to Join into Book-Looking Activities Successfully. ....   | 42   |
| Figure 12. The Child's Ability to Follow Simple and Familiar Directions $\frac{3}{4}$ Times Successfully. ....                           | 43   |



## **Chapter 1**

### **Introduction**

I picture a child during one of my therapy sessions who filled a bucket with pens, dropping them all over his lap, only to repeat this behavior again and again. I picture the child who needed to crash into his parent or the sofa before participating in our activities, and the child who screamed when his hands got just a little bit messy. I picture the child who was reported to scream in Walmart because the lights were too bright, the child who could not sleep in his own bed, by himself, or through the night, the child who screamed throughout his entire bath time each day, when presented with a particular food, when asked to climb stairs, when asked to touch or taste something of an unfamiliar texture, from an impromptu hug, and when encountering a noise that was of the wrong decibel or sound quality. I have witnessed so many frustrated, disheartened, and scared parents who were struck with the fear of the unknown; fear that they did not know what to do to help their child(ren), how to reach them, and how to get their child to be an active part of their family unit.

Tantrums in supermarket aisles, restaurants, parks, schools, at home, with a particular friend or relative unwanted experiences are common realities for many families who may not know what to do or where to turn. Sensory Processing Disorder (SPD), or sensory deficits may be detrimental to familial bonding and positive social emotional expression, and may hinder parents or caregivers and their children from enjoying successful relationships (Bolanos, Gomez, Ramos & del Rio 2016) defined Sensory Processing Disorders as, “a complex developmental disorder in which people over-respond, under-

respond, excessively crave/ seek out intense sensory experiences, have difficulty discriminating sensation to respond to sensory input in an atypical manner, impacting their daily life activities”.

Consider this example of the effects that a sensory disorder can have on a child. A two-year-old child is crashes into the sofa again and again while screaming. His parents begin with trying to reason with him, to show him something else to do to distract him from his activity. This activity may escalate into mom or dad getting upset and possibly yelling, which may entice their child to yell still further and begin to have a temper tantrum. The parents may not understand why their child is exhibiting this behavior again and again. Sensory struggles along with typical behavioral issues in young children may occur when they are least expected. Parents may not have any idea what is wrong, as the child may not be able to articulate his or her angst. Children will often give themselves the sensory experiences they seek by negative means, such as those described above. By teaching positive and appropriate sensory strategies instead of destructive ones, my hope is that these families will become closer and more effective in their communicative intent. One approach that has been used to help children with sensory differences is sensory integration therapy.

Sensory integration is the ability for someone to be able to process sensory stimuli in his or her environment so that he or she may be successful when adapting to varying circumstances that may be presented to him or her. Visual, tactile, auditory, and proprioceptive input (where the body is in space and its reactions to various sensory input) affect different people in a variety of ways. Sensory processing disorder is the disorder that results from a person’s inability or struggle to successfully meet his or her

own sensory needs. Sensory integration involves using those sensory strategies to enhance functional performance, and as the child enters school, educational performance.

Children who are suspected of or who have a diagnosis of Autism may also often struggle with sensory processing issues. Children who struggle with engagement, using sustained eye contact, and general reciprocal conversational skills (either verbal or non-verbal) may benefit from having their sensory systems regulated through sensory integration. The implications of the implementation of appropriate sensory strategies, may be linked to an increase of successful social emotional interactions with family members, while limiting tantrums on the part of the child, which may increase bonding, thus producing happier and more connected families.

When implemented appropriately, the possible implications for successful learning may increase substantially. This may be due to the child's ability to engage without negative behaviors clouding the interactions that he or she partakes in. If unwanted behaviors, such as jumping, running, tantruming, crashing into people and objects, screaming, hand flapping, spinning, and touching people inappropriately either stop or those interactions are accessed in a more positive manner, the children involved will then have their hands, bodies, and minds ready for more purposeful and interactive communicative experiences without their sensory needs getting in the way, as they were taken care of beforehand through sensory integration.

The purpose of this study was to examine the effects of a sensory integration program on a two-year-old child with special needs, by reducing tantrums. My hypothesis was that the use of sensory integration would help to reduce unwanted

behaviors and enable the child to more fully participate in positive life experiences, thus increasing positive life experiences due to social emotional success.

Helping a child to self-calm and teaching him or her to self-advocate-by giving him or her a voice; either by spoken language, sign, gesture, or picture to ask instead of tantruming, may help to foster the positive relationship that he or she may have been seeking with their parent. An appropriate sensory diet comprised of strategies that a child could use to help with any immediate sensory struggles may help with calming, focus, and attention will give the child the ability to enjoy positive interactions with the people in his or her life. The result can be increased bonding with family members, while limiting frustration and angst. Examples of possible sensory strategies to be used may include squishing with pillows for proprioceptive input to help with calming, focus, and attention, lotion, using a washcloth on or brushing arms, legs, back, hands, and/ or feet, joint compressions, pressure or weighted vest, wheelbarrow walking, wall push-ups, vibration, calming scents such as vanilla or lavender, lighting, music, bouncing on the ball, rolling over a ball, having a ball rolled over the child, jumping on the ball (with adult support) or jumping on a trampoline, and swinging in a blanket, to name some possibilities. Sensory strategies may be demonstrated at particular difficult times of day, within typical familial routines, in order to empower the youngster to implement his or her own appropriate strategies seamlessly in order to further the bond between child and family while limiting upset.

Possible implications for social emotional success are that through the implementation of (SI) Sensory Integration strategies, children will be able to have increased success with social emotional reciprocity with their family members, as they

learn to independently incorporate these strategies when necessary throughout the day, along with the help of their family members. Strategies used may help with focus and attention, calming, visual processing, auditory processing, vestibular processing, tactile processing, increased eye contact, and oral sensory processing. By giving children the strategies that they need to be their most successful selves, children may have increased success with functional familial reciprocity, due to limited frustration.

## **Chapter 2**

### **Literature Review**

#### **Sensory Issues in Children with Autism**

A study by Tomchek and Dunn (2007) examined the sensory difficulties of 281 children with autism, and the issues that sensory difficulties posed for their daily lives. Participants were comprised of children aged three to six years with ASD, compared to a similar number of their typically developing peers. Caregivers of the participants completed the Short Sensory Profile (McIntosh, Miller, & Shyu, 1999). The results showed that 95% of the children with autism showed evidence of sensory processing dysfunction compared to 15% of the typically developing children.

Within the study, parents of children with ASD noted that their children would not respond to certain sounds, had sensitivity to tastes, were often (comparatively) insensitive to pain, were overexcited by touch (e.g. tickling), did not appear to listen when spoken to, were particularly interested in seeing how things moved; finger, whole body, or hand mannerisms were also present. The findings indicated that the children with ASD struggled with tactile, taste, smell, and movement sensitivity, were either under responsive or sensation seeking, struggled with auditory filtering (level of distraction), presented with low energy, and had visual/ auditory sensitivity (may have responded unfavorably to loud noises or movement). In almost all areas the children with autism suffered with sensory issues significantly more than their typically developing peers. From my own observations of children with autism, many present with struggles in one, some, or all of the sensory areas listed; figuring out what sensory strategies will help a

child to engage in reciprocal communication and social reciprocity is crucial in order to avoid frustration and angst to assist with successful outcome(s).

In Baranek's (2002) review of the efficacy of sensory and motor interventions for children with autism, she described behaviors negatively affecting sensory systems of those with autism as compared to other differential diagnoses. Several intervention methods were reviewed, including sensory integration therapy (SIT). Baranek concluded that, despite some positive findings, there was little empirical evidence to support the use of sensory integration therapy. She recommended that intervention decisions be made on an individual basis.

### **Efficacy of Sensory Integration Therapy for Children with Autism**

The intent of Sensory Integration Therapy (SIT) is to help those affected to acclimate to the sensory need that they are struggling with at the time, so that they don't feel out of their element in everyday situations that they may face. A person's sensory system may affect him or her very differently than the others in his or her world. Each child's struggle is based on how he or she perceives his or her body in space; how he or she adapts to the things that are a part of daily life, which are so embedded in our psyches that we often do not notice them.

A study of the effectiveness of sensory integration interventions for children with autism spectrum disorders by Pfeiffer, Koenig, Kinnealey, Sheppard., and Henderson (2011) provided a framework for the present proposed study. Pfeiffer et al (2011) studied 37 children ages six to twelve years in age with Autism Spectrum Disorder (ASD). They administered the Sensory Processing Measure (SPM), Social Responsiveness Scale

(SRS), Quick Neurological Screening Test, 2<sup>nd</sup> edition, Vineland Adaptive Behavior Scales, 2<sup>nd</sup> edition (VABS-2) and Goal Attainment Scaling before and after the intervention. The subjects were divided into two random groups; 20 to receive Sensory Integration (SI) and 17 to receive Fine Motor (FM) interventions, according to specific goals. The fidelity measures treatment interventions, and therapeutic strategies were established for each.

Through pretests and posttests, the researchers measured social responsiveness, sensory processing, functional motor skills, and social emotional factors; significant positive changes including a decrease in stereotypic mannerisms often found to be used by people with autism, were noted. Interventions were implemented as part of a summer therapeutic activities program; each child had 18 treatment interventions of 45 minutes each over six weeks, except for one who participated in 17 due to absence. Both the Sensory Integration (SI) and Fine Motor treatment group used specific spaces conducive to success for each, with treatment done according to the needs of each child.

The SI group provided environmental modifications and sensory opportunities, fostered adapted responses, “just the right challenge”, and promoted the therapist-child relationship. The FM group focused on constructional, drawing and writing, and FM crafts during individual Occupational Therapy (OT) sessions with a supervised graduate student. According to the Goal Attainment Scaling scores, the most significant changes were found in the SI group, although the FM group were also positive. Future outcome studies may be established for children with ASD. The implications of the results of this study were that after intervention, the children in the SI group had significantly fewer undesirable behaviors including stereotypic movements, which facilitated increased



positive engagement. Implications were huge; by being given the tools to self-regulate, the children may be able to have increased communication and reciprocity with others, thus fostering relationships in their lives, and bringing them socially closer to the others in their world.

The discussion of nurturing parent-child relationships was at the forefront of a study by Weatherston, Ribaud, & Glovak (2002). Strategies used by Weatherston, Ribaud, and Giovak (2002) included relationship building, meeting and sharing in observation with the parent about the infant together throughout intervention, offering specific guidance about specific needs and accomplishments of the infant, facilitating opportunities for interactions, helping a parent to find pleasure in the interactions as the parent initiated the interaction(s), allowing the parent(s) to voice fears and success, even as compared to the parent's history/ies, and identifying, treating, and collaborating with others. These, and other, relationship-based practices were used to meet the parent at his or her present level of understanding in order to gain the clarity needed to benefit the infant-parent relationship. Difficulty meeting a child's sensory needs may lead to a disconnect between parent and child, and figuring out what a child would initially bring to a relationship may be a start in integrating purposeful positive interactions between them and the others in their lives.

The family described in this article completed the Infant Toddler Developmental Assessment (IDA) in order to better understand their son's present level of development. This child's negative reaction to various environmental stimuli may have hindered his familial relationships as parents may not have known how to meet their child's sensory needs, which may have affected his emotional stability, manifested as poor motor

planning. Deep touch pressure, skin brushing, joint compressions, and hand hugs were introduced to the family in this study as a way to help their son with calming.

Intervention was implemented on a weekly basis, as part of an Individualized Family Service Plan (IFSP) that included play sessions which facilitated positive engagement between siblings, as well as parental discussion in order for the child's mother to let go of her guilt. Following the intervention, the child appeared less stressed with his movement through space, and a "sensory diet" was established to be implemented throughout typical daily activities, to help the family to focus on the joy that their child brought them.

(Weatherston et al 2002) reported that the child felt more secure in his own body, became more independent and began to explore his world more regularly, was sleeping better, was eating a wider variety of foods and textures, and his interactions with his brother had become increasingly positive following the intervention. This conclusion was achieved due to the positive interactions between family members after interventions had taken place; parental discussions were part of the protocol of treatment. Through observation and parent interview, the authors noted how the child's parent(s) were able to explore initial feelings of despair and sadness that were eventually replaced with joy at meeting their child's needs through SI therapy.

A study by Critz, Blake, and Noguera (2015) addressed difficulties that children may face that cannot be seen or understood by looking at them, such as specific difficulties incorporating visual, auditory, tactile, taste, vestibular, and proprioceptive input. These struggles may have altered the way that they interacted with others, as well as their immediate environment. If a child's sensory needs are not met, the child may be understood, not only by his parents, but misdiagnosed by medical professionals. The

authors hypothesized that integrating sensory stimuli (vestibular, visual, auditory, taste, and auditory) in a positive manner into a child's life may lessen motor or academic difficulties for a specific learner. Sensory strategies, in this instance were used as needed in conjunction with specific child and circumstance. The *Sensory Profile 2, Adolescent/Adult Sensory Profile*, and the *Sensory Processing Measure* were used to denote areas of sensory need. Treatment using evidence based practices with a multidisciplinary team, Sensory Integration Therapy (SIT) was used to address the child's specific need, through a "sensory diet" made especially for him to help with his regulation and increase of function. It was determined that children who presented with symptoms including difficulty with self-regulation, sensory and motor irregularities should be further evaluated to note if sensory deficits are a stand-alone diagnosis, or may be embedded in autism spectrum disorder (ASD), attention deficit/ hyperactivity disorder (ADHD), mental health disorders, or behavior or learning disorders.

Schaaf, Benevides, Mailloux, Faller, Hunt, van Hooydonk, and Kelly (2014) examined children's aversions to certain parts of their environments, including textures and touch, sounds, sights, smells, and tastes, their potentially disturbing effects, and how they affected certain children. These disturbances may have gotten in the way of a child's engagement, and may have hindered appropriate responses to stimuli in the environment. There were 32 children involved in this study. 17 were in the treatment group, and 15 were in the control group. All were between the ages of 4.0 and 7.11 when enrolled in the study, with a diagnosis of ASD, a nonverbal cognitive level of 65, with difficulty with processing and integrating sensory information (as noted on the *Sensory Profile* with three or more subscores in the definite difference range) or the

*Sensory Integration and Praxis Test* (SIPT) with a score of 1.0 SD or below on three or more subtests. (Ayres 1989) Parents were to attend three weekly sessions (of one hour each) for the ten-week study while refraining from new medications or trails during the designated timeframe. OTs with Sensory Integration (SI) certification and training for this specific activity delivered the intervention activities to the participants. Families filled out Likert-style rating scales to address each of the sensory domains (Visual Processing, Vestibular Processing, Touch Processing, Multisensory Processing, Oral Sensory processing, five modulation areas, and three domains describing emotional and behavioral responses. Examples of goals were in reference to improved sleep, success in touching food and increasing food intake repertoire by decreasing oral motor sensitivity, success with putting on articles of clothing, (such as a sock independently), and an increase in contact with another person, such as a sibling, for a certain amount of time. Goals were written to be measureable and observable. The *Vineland Adaptive Behavior Scales-II Parent Report* (VABS-II) was used to assess engagement across typical settings such as school, home, and within the community, both before and after assessment.

Intervention included the use of gym equipment, including but not limited to swings, mats, a climbing wall, carpeted barrels, large inner tubes, carpeted scooter boards and foam blocks to facilitate participation to then denote behaviors upon completion, to note if engagement increased due to sensory needs being met, due to increased body awareness and the sensory input provided from these experiences (among others). The evaluators were not privy to the information of who was in which group (those with ASD or in the control group). Results of the study included that undesired sensory behaviors decreased for the treatment group as compared to the control group. Although the

treatment was said to be effective, it was not determined if sensory processing was changed through its process.

The goals were to evaluate parent reports of individual goal accomplishments, as well as the effects of the intervention on sensory, adaptive, and functional behaviors. It was determined that more evidence was needed, especially in relation to the measure of fidelity. The children were primarily assessed through the standardized measure of Goal Attainment Scaling, to provide specific relevant goals for children with ASD. This was achieved based on each child's performance level through measurable observation of frequency and duration (Shaff, R. et al. 2014). Results of the study included that undesired sensory behaviors decreased for the treatment group as compared to the control group.

Sniezyk & Zane (2015) investigated the efficacy of sensory integration therapy (SIT) for children with autism. Stereotypic behaviors included spinning, rocking, hand flapping, constantly moving, touching body parts, getting out of their seat, laying and rolling, and difficulty with attention and focus, along with other repetitive movements that caused challenges behaviorally for those exhibiting symptoms, which were said to limit positive skills including learning skills and engagement with others. In this study, deep pressure, weighted vests and backpacks, along with brushing were procedures attempted to assist with such deficits as described above, in order to prove their efficacy in limiting the unwanted behaviors listed above. There were three children with ASD in this study (one female and two males) who attended a preschool program for children with disabilities. All of the children were initially tested using the *Preschool Language Scale- Fourth Edition* and the *Battelle Developmental Inventory- Second Edition (BDI-2)*. At the time of the study, the children were between two years, nine months and three

years, five months in age. The 5 ½ hour, 5 days per week preschool program implemented Applied Behavioral Analysis (ABA) and discrete trial training, speech therapy, occupational therapy (OT), and physical therapy (PT) on an as needed basis. Treatment plans using sensory integration techniques were arranged for each of the three children in order to implement strategies to help with calming, in the settings most difficult for each. Strategies included swinging, deep pressure by pressing down on shoulders, biceps, etc., pushing a heavy cart (“heavy work”), the use of the therapy ball, and joint compressions. The interventions used in this study were relatively ineffective for the children involved, according to data collection and observation. This study is different from similar studies due to the negative conclusions that were drawn from this example.

Ben-Sasson, Cermak, Orsmond, Tager-Flusberg, Carter, Kadlec, & Dunn, W. (2007) scrutinized the occurrence of extreme sensory modulation behaviors in toddlers with autism spectrum disorders (ASD). The study looked at 101 toddlers with autism spectrum disorders (ASD) (with a mean Chronological Age (CA) of 28 months and a mean Mental Age (MA) of 18 months based on the *Mullen Scale of Early Learning* (MSEL) (Mullen 1995) were compared by chronological age to 100 typically developing toddlers, and the mental age of 99 infants or toddlers to note sensory modulation behaviors by comparison, in order to figure out which sensory areas affected the children with ASD the most in order to help to modulate the resulting behaviors in a positive manner. Phone screenings to determine subject match for the study, along with the *Infant/Toddler Sensory Profile* (ITSP) and the *Infant Toddler Social Emotional Assessment* (ITSEA) were used to compare the groups to determine if there was a correlation between

sensory behaviors described by parents of children with ASD on a cross parent questionnaire, within a parent interview, and during clinical observation, in order to note if these toddlers were dissimilar in the amounts of their sensory modulation behaviors.

This study confirmed the efficacy of the ITSP as it showed that extreme sensory modulation behaviors in toddlers with ASD should be addressed early on, so as to reference issues with low registration and avoiding behaviors that may affect the social reciprocity and daily communication of toddlers with ASD. These behaviors may include an avoidance of eye contact, playing with others, or ignoring behaviors. According to the study, results for the Low Registration and Avoiding scales showed that more than half of the participants had difficulty with social reciprocity, of which challenges with multiple interactions occurring at one time, as well as unknown stimuli hindered back and forth engagement. Children with ASD may have had limited engagement of exposure to sensations that their peers may have experienced, and may in turn be have deprived sensory systems causing insufficiencies. Because of this, toddlers with autism should be evaluated early and treated in order to help with increased engagement and coping skills as they mature. The implications of the results were that if children did not get their sensory needs met, they might struggle with facilitating positive engagement with those in their lives, as is often the case for children with ASD. Sensory struggles may lead to tantruming and a shared negative affect between child and caregiver.

Siaperas, Ring, McAllister, Henderson, Barnett, Watson, & Holland, (2012) used their study to demonstrate if diminished motoric abilities and sensorimotor impairments were related to age. Children were tested in order to determine said abilities one time

each through the use of the *Movement Assessment Battery for Children-2* (MABC-2), and the *Sensory Integration Praxis Test* (SIPT). Fifty 7 to 14 year old boys with Asperger's Syndrome (AS) (as per the DSM-IV), were compared to 50 of their typically developing peers with a mean age of 10.84 years. Each had a ten-minute break. The MABC-2 was administered prior to the SIPT. Movement performance in addition to sensory integration were recorded from both groups of boys. Tasks included copying postures demonstrated by the examiner, copying planned hand or finger movements as demonstrated movements with hands and feet, and balance activities with open and closed eyes, among others. The children with Asperger Syndrome (AS) displayed significant sensorimotor impairment. Difficulty processing proprioceptive input (where their bodies were in space and how they interacted with the world around them), along with exposure to additional sensory information manifested as poor motor planning and difficulties with all of the above activities during testing. Sensory and motoric struggles may have had a detrimental effect on the everyday lives of these youngsters, as they appeared to need additional support for everyday activities, which may have limited future socialization possibilities. The boys with AS showed significant difficulties with movement, along with issues with proprioceptive and vestibular sensory processing.

Roley, et al. (2014) looked at social patterns to see if children's social participation increased if their sensory integration needs were met. *Sensory Integration and Praxis Tests* (SIPT) were given to 89 children with ASD, ages 4.0-11.0 years of age who had received an OT evaluation from 1989 to 2011, and completed at least 11 of the 17 SIPT tests. Visual perception and visual construction were areas of relative strength, whereas struggles were apparent in imitation praxis, vestibular bilateral integration,



somatosensory perception, and sensory reactivity, which was noted to affect their successful participation which hindered their social emotional reciprocity with others. Visual Perception and Visual Construction were the areas of greatest strength for the children in the study with ASD, but imitation praxis was negatively affected. Struggle with accepting sensory stimuli was evident across settings (home and school). Strengths in visuopraxis (Visual Perception and Visual Construction) and struggles in somatopraxis (Somatosensory Perception, Imitation Praxis, Praxis on Verbal Command, and Vestibular Bilateral Integration and Sequencing) were evident in this study. This information may help to provide insight into sensory programs for affected children. Implications of the study were consistent with those who also derived that engagement with others may be hindered by an inability to have sensory needs met.

Schaff, Hunt, J., and Benevides, (2012) implemented a sensory integrated approach similar to the one used for purposes of this study. The participant was a five year, five-month-old child who had diagnoses of ASD and attention deficit hyperactivity disorder (ADHD), as ascertained from the *Autism Diagnostic Observation Schedule* (ADOS). The child was described by his mother as having difficulty with engagement with peers, although “very affectionate and super smart”, he struggled with distractibility, impulsivity, clumsiness, and rigidity that would cause him to get “stuck” in activities with difficulty transitioning or “shifting focus”; difficulty with dressing and sleep were also noted. The *Sensory Integration and Praxis Test* (SIPT; Ayres, 1989) was used to assess sensory integration ability for perception, motor planning, and spatial actions. The *Sensory Profile* (Dunn 1999) and the *Sensory Experiences Questionnaire* (SEQ; Baranek et al., 2006) measured hyporesponsiveness and hyperresponsiveness to sensation. The

Parent Rating Form of the *Vineland Adaptive Behavior Scales, Second Edition* (VABS-II; Sparrow, Cicchetti & Balla, 2005) addressed adaptive behaviors, along with communication, daily living, and motor skills.

Initial results showed that sensory processing deficits and praxis affected the child's ability to engage in everyday settings such as socially, in the home, at play, and during community activities, as exhibited by his hyperresponsivity to auditory, tactile, and oral sensory input, poor auditory filtering, seeking of vestibular input, and hyporesponsivity to painful input, difficulty with tactile and kinesthetic processing, and motor skills. Struggles also included receptive communication, personal daily living skills, play and leisure time skills, and gross and fine motor skills were rated as low, expressive communication, interpersonal relationships, and coping skills were rated as moderately low. Occupational Therapy and Sensory Integration were implemented for this child for 30 sessions over ten weeks, as a model for best practice for treating children with autism and difficulty with sensory integration. The child improved in his regulation to organize responses to auditory, vestibular, tactile, and oral sensory input and movement, although socialization and daily living scores were not noted to have improved in this study. (Scahff, R. C. 2007) Although implications of an increase of positive interactions with others was not apparent, observed success was noted due to increased sensory integration for this child.

## **Conclusion**

Most of the research reviewed above suggested that, when used appropriately, sensory integration therapy may help children with autism with increased success in

social emotional reciprocity, engagement with others in their lives, and decreased frustration with things beyond their control, such as the way their clothing bothers them, loud sounds, regulation within unwanted life circumstances (such as large crowds or other environmental struggles), acceptance of a variety food tastes and textures, touch, and others in their environment, among other struggles. The present study was designed to examine the effects of sensory integration therapy with a young child with autism.

Future research on sensory integration therapy is needed in order to demonstrate to pediatricians the importance of helping young children with sensory integration disorder so that they may discuss sensory integration and link the young families that they encounter in their practices to the appropriate specialists in order to help with increased attention to task, limiting upset and related tantrums, overall increased social engagement, reciprocity with others, body awareness, and ability to engage in tactile, visual, taste, auditory, and other sensory struggles by incorporating the needed sensory strategy or strategies. If they do this, my hope is that these young children will grow and thrive into adulthood as more grounded, sensory integrated, engaged, and productive adults with sensory needs that are met by the appropriate sensory strategies, resulting in increased productivity in future school, and in life.

## **Chapter 3**

### **Methodology**

This study utilized a single subject design to examine the effects of incorporating sensory integration strategies with a child who struggled with tantruming and an inability to express himself. This study took place at the home of a child in southern New Jersey.

### **Subject**

This child who was the subject of this study was twenty-eight months old at the beginning of the study. This child was referred by his physician for early intervention services due to concerns that the child showed early signs of autism. The child was reported to become upset easily, and did not show interest in other children. He had shown regression in both receptive and expressive language. The child was born at 34 weeks gestation, weighed five pounds, six ounces, and remained in the neonatal intensive care unit for two weeks due to complications including a cord wrapped around his neck. He was seen by a cardiologist for a heart murmur, which has since resolved, and had been diagnosed with asthma.

This child was reported to be most successful with routines and predictable activities, and might tantrum when presented with things that were out of his comfort zone. His mother had noticed that he had recently lessened his mouthing of toys, but was typically very “rough”. He had frequent tantrums during which he was reported to bang his head, throw himself back, bite, and had difficulty with sustained attention and engagement. He was also reported to have difficulty with eye gaze shifting, reciprocity, along with playing appropriately with toys. In addition, he was reported to have

difficulty with grading his movements, as evidenced by his struggle to use appropriate force on objects as he often knocked himself into objects and people, and also had difficulty with using the right amount of force on his toys which made them difficult for him to use. He was a very large boy with low muscle tone. He tended to “w” sit on the floor with his legs splayed out on both sides of him. A tremor was noticed when intentionally placing or reaching for objects, although he was able to use both hands in play. Even though he was able to pick up small objects, he struggled to isolate his index finger to point, turn pages of a book, and to use a neat pincer grasp.

This child had begun to display an understanding of tones of voice, as reported by his mother, but often did not respond to commands. He could vocalize non-speech sounds, and engaged in non-speech (tongue click) and marathon speech (fast-paced jargon). He was able to reach for things that he wanted, and used some limited single words. He was just beginning to follow a verbal/ gestural request such as, “Give me.”. He had begun to increase his attention to speech, and follow verbal/ gestural requests. He was able to use gestures (“wave”, “point”, and “up”). He primarily growled or cried to gain attention.

The child’s parents reported that he bit, hit, or kicked, unfamiliar people. He was able to imitate during play, however these interactions were extremely brief. He was reported by his parents to be aggressive with other children, in particular, his younger brother. His mother noted that he tantrumed when overwhelmed by too many people, and was also reported to have difficulty transitioning between activities. Some emerging reciprocity and shared affect was noted, however very brief. Due to difficulty accepting

when things did not go his way, such interactions often resulted in tantruming including throwing himself back, kicking, hitting, and biting.

During observation, this child appeared extremely dysregulated, which was evidenced by his running, screaming, climbing, and his apparent inability to self-calm. He appeared to struggle to make his wishes known, which resulted in hitting, kicking, biting of his mother, throwing objects such as toys, and other similar tantruming behaviors. He went after his 18-month-old brother to take something from him, and the two boys screamed together as they ran back and forth throughout the house while sharing a candy. The child's mother said that she often gave her child food as a way to calm him down, and stop his outbursts. The child was very large in comparison to his same aged peers, and was either eating a snack or drinking his milk throughout the entire initial exchange (approximately one hour).

### **Instruments**

Prior to the start of the study, the child's mother administered the *Sensory Profile* regarding her son (Dunn 2014). The researcher reviewed the instrument with the parent so that she could better understand the specific sensory struggles of this child, broken down into areas of concern, and by age in months for some examples. For each question, parents answered if their child exhibited a certain behavior "Almost Always", "Frequently", "Occasionally", "Seldom", or "Almost Never". The instrument covered General Processing, Auditory Processing, Visual Processing, Tactile Processing, Vestibular Processing, and Oral Sensory Processing. Scores were derived by comparisons of the parent's in each of the listed domains, by using the Likert Scale

described above. Other areas addressed were Low Registration (It may take this child additional sensory input to be in line with his same aged peers), Sensation Seeking (a child may seek movement activities along with other tactile experiences as a way to wake up their nervous systems), Sensory Sensitivity (varying awareness to extraneous sensory experiences: sight, touch, taste, pain, and smell), Sensation Avoiding (avoids certain sensory experiences ) (Dunn 2001), along with Low Threshold which is the combined scores of Sensory Sensitivity and Sensation Avoiding. Scores were derived by categorizing sensory issues that a child may face, and were then marked as “Definite Difference Less (or More) Than Others”, “Probable Difference Less (or More) than Others”, or “Typical Performance”.

For this child, the initial results yielded scores of a Definite Difference More Than Others in Low Registration, Sensory Sensitivity, Sensation Avoiding, Low Threshold, Auditory Processing, Tactile Processing, Vestibular Processing, and Oral Sensory Processing. The child had a Probable Difference More Than Others in Sensation Seeking and Visual Processing. This child did not have a Typical Performance rating for any of his sensory systems on this specific rating scale for his first *Sensory Profile*. The researcher thoroughly went over questions with the child’s mother to make sure that she understood the questions and how to rate them according to her child’s performance. Scores repeated at the conclusion of the study included those of a Definite Difference More than Others in Low Registration, Sensation Seeking, Sensory Sensitivity, Sensation Avoiding, Low Threshold, Auditory Processing, Visual Processing, Tactile Processing, and Oral Sensory Processing. He had a score of a Probable Difference More than Others

in Vestibular Processing, and no area that was found to be within the Typical Performance range on this caregiver questionnaire.

At each biweekly visit, this child's mother filled out a "*Response Scale Parental or Caregiver Questionnaire*" (RSPCQ) to denote her son's progress. This survey was designed as a parent friendly material for the parent to note how well her child was doing functionally, so that progress could be noted over time to see if the sensory strategies did in fact, make a difference in the child's behavior and in the family's interactions with their child. The survey instrument referenced engagement, response when the child's name was called, tantrums, communication/ communicative intent, eye contact/ eye gaze shifting, the child's trying to get the caregiver to notice something, accepting affection, engagement in messy play activities, interest in certain objects, appropriate use of objects, engagement with pretend play activities, commenting back and forth, distractions by noise, engagement in book-looking activities, and following directions.

Due to concerns about autism, the *Early Start Denver Model* (ESDM) was implemented for this child, during early intervention visits. The outcomes established went along with those found on his Individualized Family Service Plan (IFSP), but were more specific in terms of engagement with others. For this child, ESDM outcomes were as follows. For Expressive Language, the child was to be able to hand an object to get help to an outstretched hand in  $\frac{3}{4}$  opportunities, and push away or give back an unwanted item in  $\frac{4}{5}$  opportunities. For Receptive Language, the child was to respond to his name during a Sensory Social Routine (SSR) (eg. Peek-a-boo, bubbles, balloons, or musical instruments) in  $\frac{2}{3}$  opportunities. In the area of Social Skills, the child would engage in a SSR for two or more minutes with a calm body while looking and smiling, use



vocalizations or gestures to initiate or continue a song or bubbles, etc. when stopped in 2/3 opportunities, and participate in eight or more sensory social routines by smiling or watching daily. Play goals included repeating an action five times consecutively when placed in front of him three times in a 15 minute period, and repeating an action eight or more times to play with a pegboard, ring stacker, blocks, or shape sorter, etc. Behavior goals included sharing the play space/ material with his brother (no hitting, kicking, biting, or pushing) for 10 minutes with adult supervision (by parent report), transitioning from a preferred activity(ies) to a less preferred activity(ies) within one minute with visual cues in 3/4 opportunities, and inhibiting actions or using vocalization/ gesture(s) to express frustration to “Stop” or “No” (or other trigger) in 2/3 opportunities presented. Behavior ratings were completed at 15 minute intervals; Sessions typically had three 15 minute sessions, as the fourth in an hour was used to speak to the parent and to go over pertinent paperwork. Each goal was broken up into smaller elements (five to six per goal), to keep track of success. Sensory strategies were implemented to help to gain success with the above goals, which measured the interactions that were then able to better occur afterwards. For the purpose of this study, only behavior goals were noted in reference to success with the ESDM (as in Chapter 4), as the purpose of the study was to note diminished tantruming behaviors, as opposed to other areas of developmental success.

## **Intervention**

Each Early Intervention session was one hour, and was broken down into 15 minute increments; three to implement sensory strategies through the ESDM, and one for parent discussion, paperwork, and reflection. This child was seen by his developmental

interventionist two times per week for one hour, and his occupational therapist one time per week for one hour.

Materials used to implement sensory strategies could have included, but were not limited to: squishing with sofa cushions and pillows, or sitting on them, a chewy tube (possibly frozen) or other appropriate chewing device, a washcloth, towel, or lotion massage, massager, electric toothbrush, cold (spoons dipped in ice water and then down the jawline, lips, in the mouth), brushing on arms, legs, hands and feet with a surgical brush or dry washcloth, joint compressions as advised by the occupational therapist, rocking, wall push-ups, wheel barrow walking, swinging or rolling up in the blanket, possibly with the ball rolled over him, heavy work by putting water bottles in and out of the suitcase, spinning on bottom or belly on a modified “Sit ‘N’ Spin”, rolling a partially deflated ball over the child’s arms, legs, and/ or back, rocking (back & forth, side to side), playing in a basket for movement by parent/ practitioner, squishes with hands on arms, legs, and/or trunk, or messy play with Floam, Play-Doh, or gak (a cornstarch and water mixture), before engaging in play and participating in more concentrated play including blocks, book-reading, bubbles, shape sorter, stacker, puzzles, finger plays and other games. The child’s mother participated during the sessions, in the spirit of the parent-training model that Early Intervention enjoys. Methods were selected based on the interest or sensory struggles of the child during a specific session, as recommended by his developmental interventionist.

The session began with sensory strategies, such as those described above. Each method attempted was written specifically on each *Response Scale Parental or Caregiver Questionnaire* (RSPCQ). The researcher and parent implemented the strategies as chosen

from the list to help with the struggles as denoted by the *Sensory Profile*, and then proceeded to engage in play with age appropriate toys. The child's engagement was noted through the use of the *Early Start Denver Model* (ESDM) checklist for further reference and specificity, as described above. After the Early Intervention visit was completed, the parent filled out the *Response Scale Parental or Caregiver Questionnaire* (RSPCQ) which included qualifiers or codes of "Almost Always" (1), "Frequently" (2), "Occasionally"(3), "Seldom" (4), or "Almost Never"(5) for each area previously discussed. These surveys were to be compared through data analysis at the end of the study to note success and improvement in the child's interactions with his family members, once his sensory needs were met, including but not limited to the significant decrease of tantruming.

## Chapter 4

### Results

In this single subject design study, a variety of sensory integration strategies were utilized to determine whether they were effective in helping a 28 to 32-month-old boy reduce tantrums and develop desired behaviors. This child had not yet been diagnosed at the time of the study, but was suspected of being on the autism spectrum.

Prior to the beginning of the study the child's parents were asked to complete the *Sensory Profile* (Dunn & Daniels 2002). The results indicated that the child had: A Definite Difference More than Others in Low Registration, Sensory Sensitivity, Sensation Avoiding, Low Threshold, Auditory Processing, Tactile Processing, Vestibular Processing, and Oral Sensory Processing, and a Probable Difference More than Others in Sensation Seeking and Visual Processing. There were no areas found within the Typical Performance Range.

Following completion of the study, a second *Sensory Profile* was completed. The results were as follows. A Definite Difference More than Others in Low Registration, Sensation Seeking, Sensory Sensitivity, Sensation Avoiding, Low Threshold, Auditory Processing, Visual Processing, Tactile Processing, and Oral Sensory Processing. The child had a Probable Difference More than Others in Vestibular Processing, with again no areas found within the Typical Performance Range.

In order to address the research question, "Can sensory strategies reduce tantruming to increase positive familial interactions?", the child involved in this study ("E") was observed during 15 home visits. "E" initially presented as extremely dysregulated. Sensory strategies were needed to help him to calm his body in order to

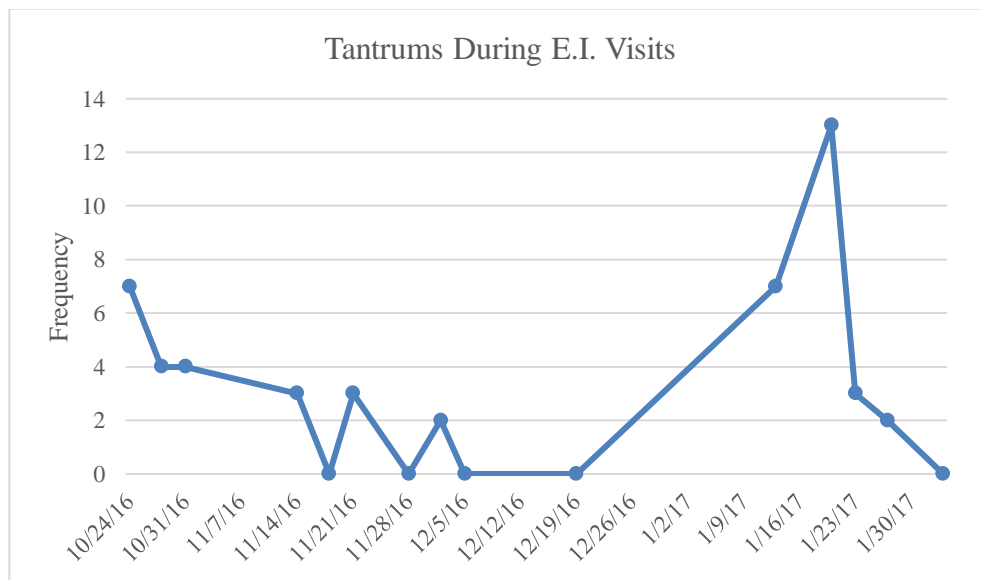
help him to positively participate within everyday familial situations. Sensory strategies used varied by date of intervention, as the child had varying needs and interests on different dates. Strategies included, but were not limited to squishing with pillows/cushions, spinning, the use of a washcloth for deep pressure on his back arms, face, and legs, squishing or rolling up in a blanket, rocking, “heavy work” with water bottles in a suitcase, rolling a (soft) ball over his back, arms, feet, hands, and legs, using “cold”, a “chewy tube”, or vibration from an electric toothbrush for increased awareness on his oral motor muscles, the use of a surgical brush on his arms, legs, arms, legs, hands, and feet, joint compressions on feet, toes, knees, ankles, shoulders, arms, wrists, and fingers, and / or messy play activities (such as “*Play Doh*” or “*Floam*”).

E’s mother completed a *Response Scale Parental or Caregiver Questionnaire* after each of the 15 visits, which was comprised specifically for the basis of this study. The questionnaire included areas of concern. The figures that follow present the results of the interventions. The figures for the *Response Scale Parental or Caregiver Questionnaire* that were represented as data in the following charts, correspond to the following codes: “Almost Always: 1”, “Frequently: 2”, “Occasionally: 3”, “Seldom: 4”, and “Almost Never: 5”.

### **Individual Results**

E initially presented as unable to self-calm; he struggled with regulation, which typically resulted in a tantrum(s) which included his throwing himself backwards on the floor, screaming, and becoming extremely agitated. Figure 1 illustrated the efficacy of the intervention. This child began with having seven tantrums during the initial visit. As

sensory integration techniques were utilized, the child began to exhibit relatively less and less tantruming behaviors, until a spike in tantrums on visits 11 and 12. Those visits occurred after the child had been absent from therapy for several weeks because while his parents were on vacation. When the parents came back after the absence, the child was extremely dysregulated, and suffered from first seven, and then 13 tantrums during visits 11 and 12 respectively. During visits 13 through 15, E had begun to respond to sensory integration strategies again, and as evidenced by Figure 1, had zero tantrums on his 15<sup>th</sup> visit, thus denoting the efficacy of treatment.



*Figure 1. Tantrums Per Early Intervention Visit.*

Figure 2 shows “E’s” parent responses on item 1 of the *Response Scale Parental or Caregiver Questionnaire (RSPCQ)* (Difficulty with engagement (tantrums)). Results for week 11 were not recorded, as the parent had difficulty with filling out the entire form due to her inability to focus due to distractions from her children. This chart denoted varying success with completing activities that the child wanted to do at the time of the EI visit.

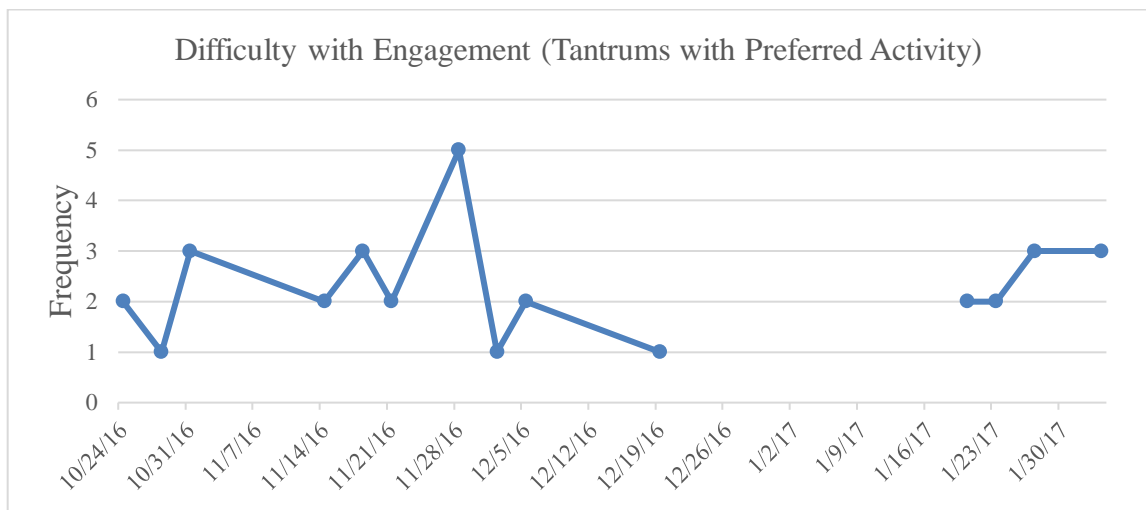


Figure 2. Difficulty with Engagement (Tantruming) During Preferred Activities.

Figure 3 shows the results on item 2 of the RSPCQ (Response to name). The parent reported three occurrences of occasional responses during the first three sessions, followed by a subsequent inability to respond to his name, beginning in session 4 and continuing for the remainder of the study.

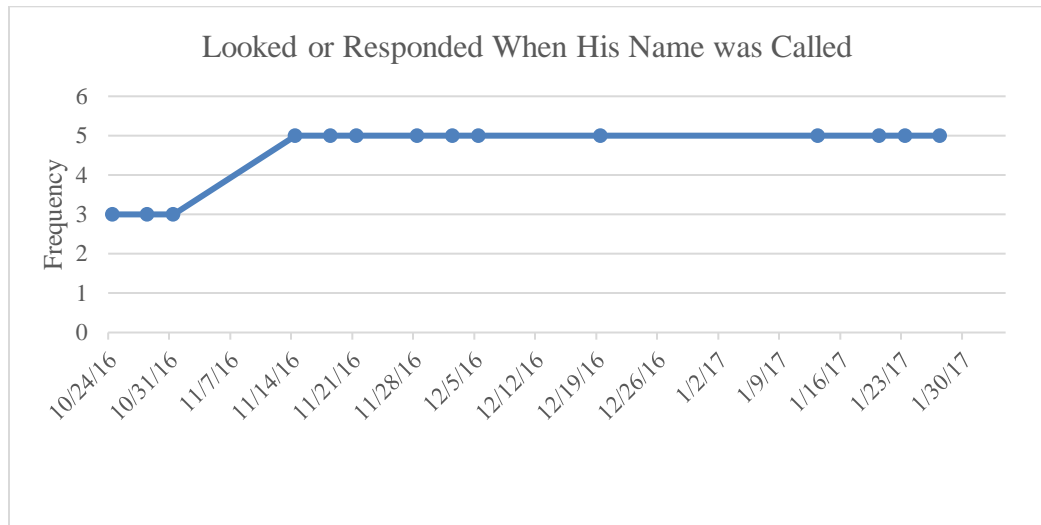


Figure 3. Frequency of the Child Looking or Responding When His Name was Called.



Figure 4 shows the number of tantrums when the child was presented with a non-preferred activity, stimuli, or sensory occurrence. According to the child’s mother, some examples of these were “someone touching his stuff”, “switching games”, “when transitioning to a new activity”, or “when you touch his toys”.

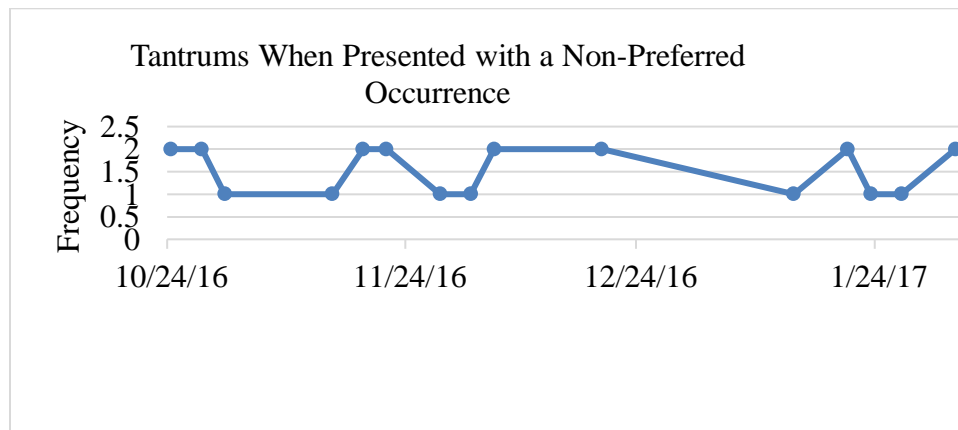
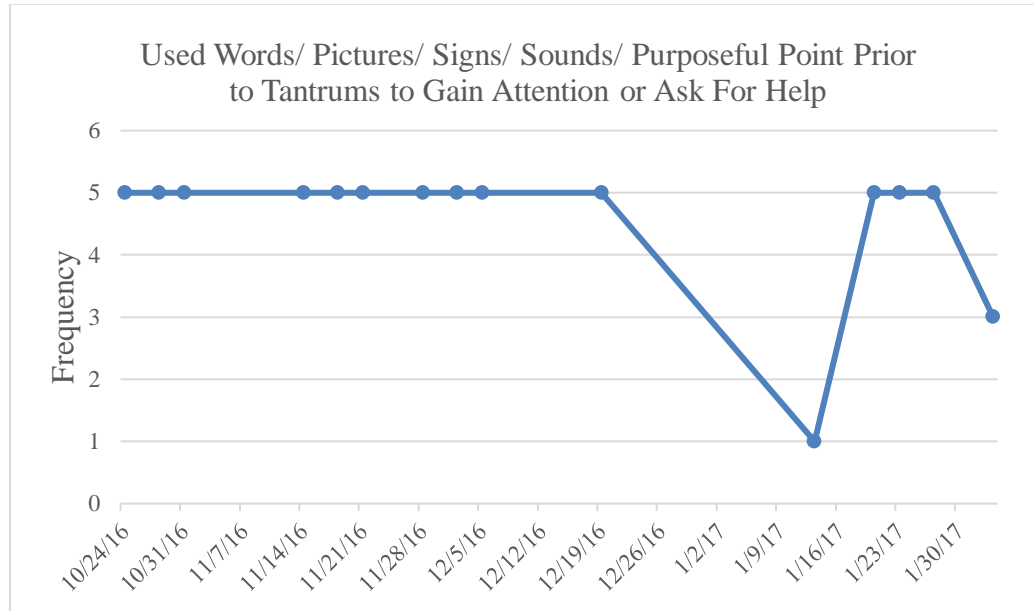


Figure 4. Tantrums When Presented with a Non-Preferred Activity or Occurrence.

Figure 5 shows the results for the child's ability to use words, pictures, signs, sounds, or a purposeful point prior to tantruming to gain attention or ask for help. This was an area of great struggle for the child in this study.



*Figure 5.* Used Words, Pictures, Signs, Sounds, and/ or a Purposeful Point Prior to Tantruming to Gain Attention or to Ask for Help.

Figure 6 shows the results for the child's ability to give appropriate eye contact to engage with a communicative partner  $\frac{3}{4}$  times. The child found varying degrees of success with achieving sustained eye contact to interact, as evidenced by the chart below.

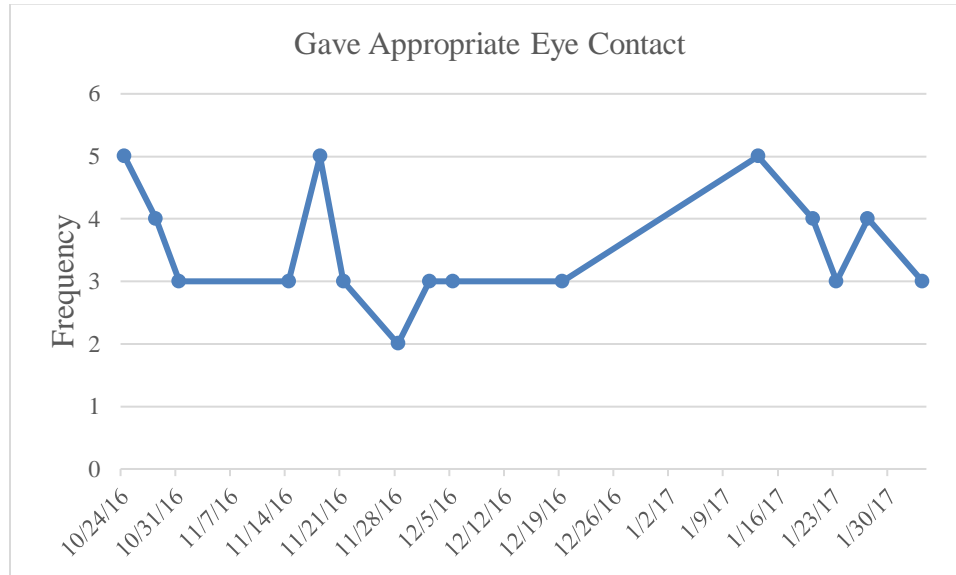


Figure 6. Frequency of Appropriate Eye Contact Given.

Figure 7 shows the child's ability to try to gain his mother's attention to something of interest to him. S. was distracted by her children during week 12, therefore no data was collected that week.

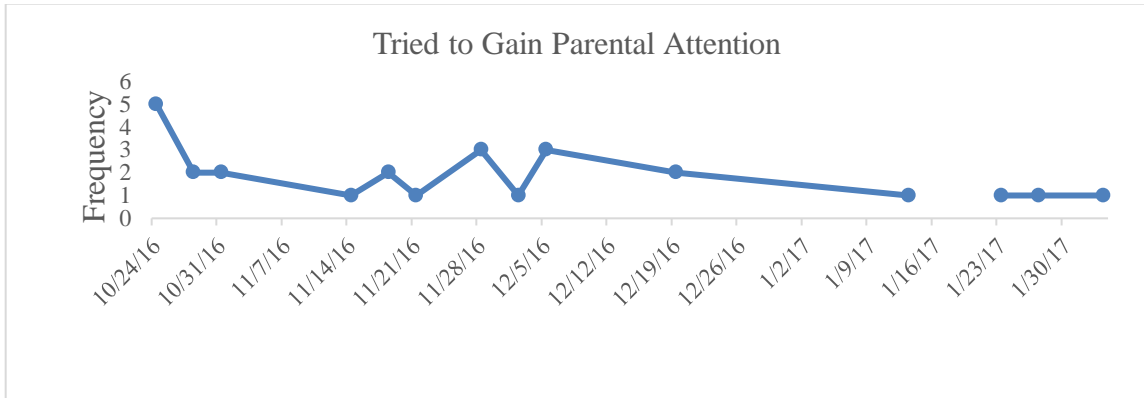


Figure 7. The Child Tried to Gain Parental Attention Toward Something of Interest.

Figure 8 shows the results for the parents' evaluation of the child's enjoyment of hugs, cuddles, or affectionate touch with his parent. This was an area of particular success for E, as he appeared to be very close with his mother.

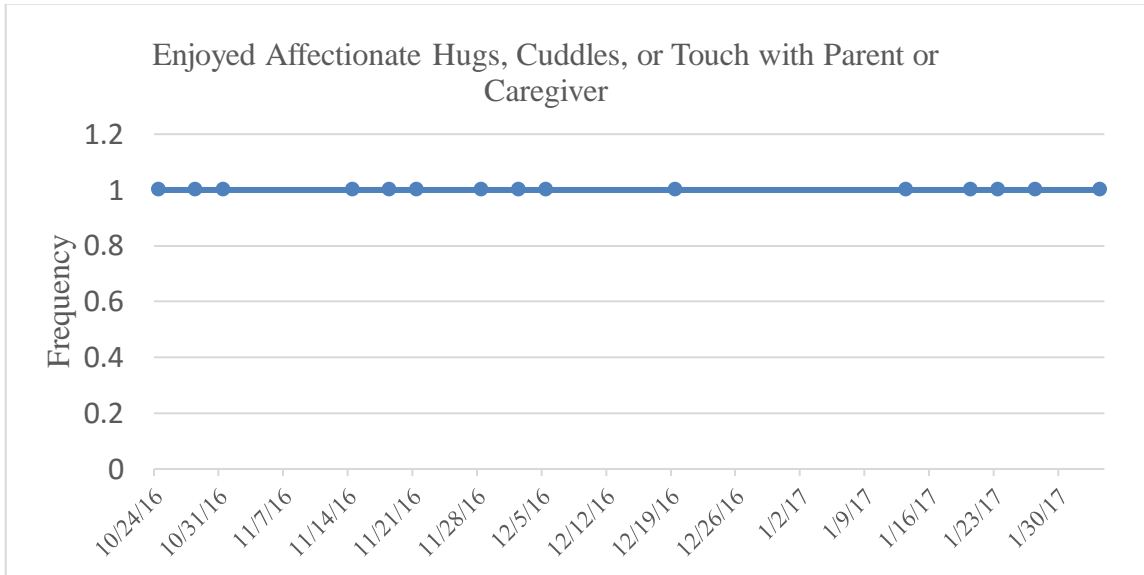


Figure 8. Enjoyed Hugs, Cuddles or Affectionate Touch with Parent or Caregiver.

Figure 9 shows the child’s success with engagement in messy play. As evidenced by his first visit, the child was noted to prefer to engage in messy play with his own defecation (eg. “smearing”). There was no response noted on visit 5 (11/18/16). Other messy play activities described were “water play”, “soap”, “Desitin” cream, “rubbing grapes over his body”, “bubbles”, “play in food and ice cream”, and “*Play Doh*”. The chart below was in reference to question number 8 on the *RSPCQ*.

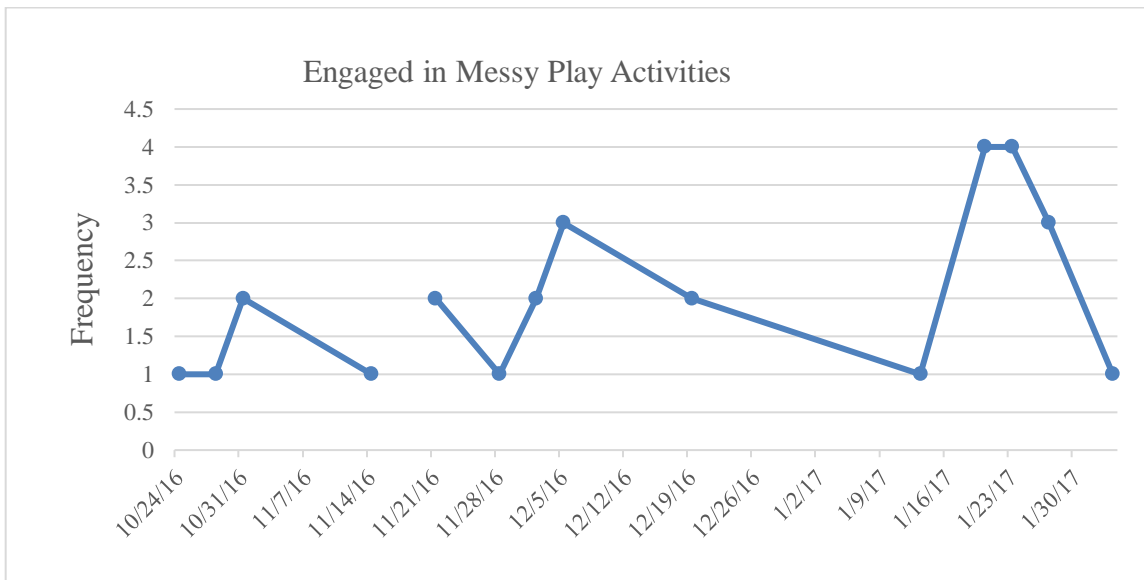


Figure 9. Frequency of the Child’s Engagement in Messy Play During Early Intervention Home Visits.

Question 9 on the *RSPCQ* was used to note the child's interest in a variety of preferred objects (3), to be used appropriately. Some of the items of interest were "cars", "balls", "a light-up toy", "blocks", the "Sit 'n' Spin", a "suitcase", his "cup(s)", "food", "stickers", "puzzle(s)", "pegs", "*Play Doh*", "TV", his "turtle", "bike", and "Legos". During each of the 15 visits, E's mother reported that she almost always felt that he showed interest in (at least some of) the above described activities. Although the activities of interest varied from visit to visit, he was consistent in his interest, by parent report.

Question 10 on the *RSPCQ* was broken down into ten sections (10a-10j). The child's mother reported if he used the following items successfully. The first item (10a) listed was a "cup". He began with difficulty using a cup, but by the end of the time of the fifteen EI visits, E was successfully able to use his sippy "cup", and he did not use a "bottle" (item 10b). Question 10c, described E's use of a "bowl". He notoriously used his bowl "occasionally" with success, but S. noted in two instances that he "almost always" used his bowl. Item 10d, the use of a spoon, was reported to have been used "occasionally", but S reported one instance of his using it "frequently"; two of his success with the spoon were noted during the last two visits recorded. Using a "comb" or "brush" (item 10e) was an area of struggle for E, although it was mostly noted as being used "occasionally", with one instance of using it "frequently", and one "almost always". Item 10f, the use of a "toothbrush" had mixed reviews, as determined by the day, varying between his use "almost always", "frequently", and "occasionally". For item 10g, the results of using a "washcloth" displayed most frequently "occasional" successful uses. E's mother shared one instance each of a "frequently" and "almost always" answer

toward the end of the study. Item 10h, the successful use of a “ball”, showed consistent success with an “almost always” rating, except for the last visit, in which he was reported to use it “occasionally”. Item 10i, the use of a “toy vehicle”, had varied responses, beginning with E’s ability to use the toy vehicle appropriately, “almost always”, followed by varied responses, but ending with “frequently”. Item 10j, the child’s ability to use a “toy phone” appropriately included varied responses, as well, as he worked on consistency with engaging in this type of pretend play.

Question 11 on the *RSPCQ*, further discussed the child’s ability to enjoy successful engagement in pretend play with a doll, action figure, or stuffed animal. This question was broken down into 4 segments; 11a-11d. Question 11a, the child’s ability to put the toy “to bed” was initially met with many responses of “almost never”, but by the end of the study, denoted responses of “occasionally”, “almost always”, and “frequently” on the last visit. Question 11b, if E appropriately engaged in “pretending to feed”, had responses beginning with “almost never”, which later became mixed reviews of “occasionally”, “almost always”, and “frequently”, as the visits progressed. Item 11c, E’s ability to put an item (as described above) item into a toy “vehicle”, displayed results beginning with “almost always”, with repeated results of “almost never”, and ending with mixed results including “almost always”, “occasionally”, and ended with “frequently”. Item 11d, “show a book” to the item began with “almost never”, had a missed charting opportunity, and ended with the mixed results of “frequently”, another missed opportunity, followed by “almost always”, “almost never”, and “occasionally”.

Question 12 on the *RSPQ* asked the parent to write in the amount of interactions that their child had in reference to “commenting back and forth” (a circle of



communication) with words, pictures, signs, or sounds, as appropriate. E’s mother, S did not consistently differentiate the modes of communication (by circling the correct mode used) used by her son, as part of the directions of the *RSPCQ*. On the first visit, E was reported to comment 5 times, followed by 1 time, 5 times, 3 times (eg. “ah” sound), 6-8 times (e.g. “ah”, “bubble”, and “go, go, go”), 3 times, 1 time (“that”, and “thanks” were written by S.), 3 times (eg. “more”), 3 times, 2 times (eg. “see”, “see”), 2 times, 2 times, 1 time (eg. “pointing”), 3 times, and 1 time (eg. “Ipod”).

Question 13 on the *RSPCQ*, determined E’s distraction(s) by a noisy environment(s) which resulted in difficulty with attention and focus, as charted below. E’s mother noted difficulty with exposure to sounds from a “lawn mower” (as described the most frequently in the study), from “too many people”, an “alarm sound”, as well as noise from the “dishwasher” (see figure 10).

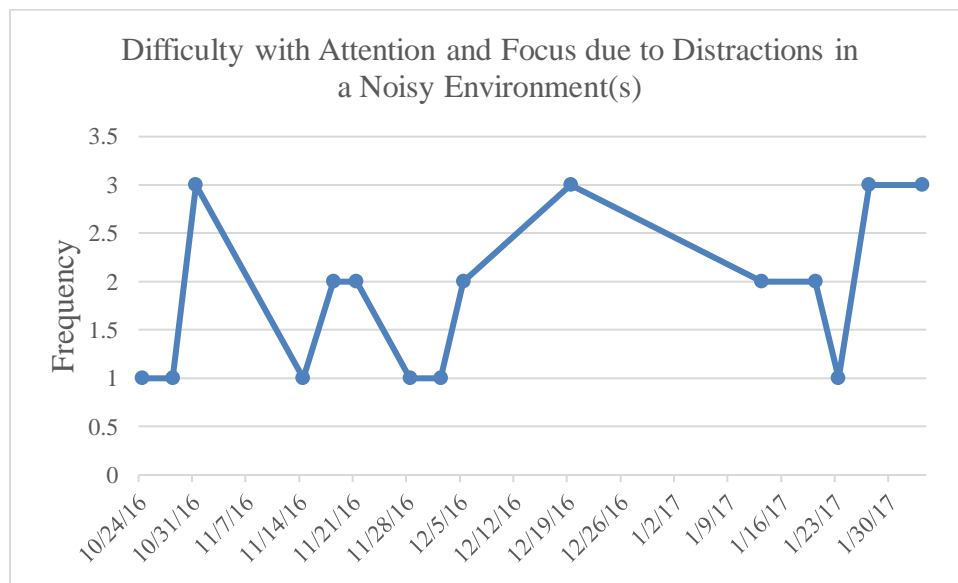


Figure 10. Distractions by Noisy Environments as Reported per Date, Possibly Causing Difficulty with Attention and Focus.

Figure 11 shows response to question 14 on the *RSPCQ* discussed E’s ability to join in to book-looking activities. According to the data below, this was a great area of struggle in the beginning of our study, although toward the middle, E began to see improvement. After his family went on vacation, he appeared to continue with his struggle, as evidenced by reports of his “almost always” struggle to engage with book activities.



Figure 11. The Child’s Ability to Join into Book-Looking Activities Successfully.

Question 15 on the *RSPCQ* expressed the child’s ability to follow simple directions  $\frac{3}{4}$  times. Figure 12 shows that, as time progressed there was improved progress in this area., followed by regression.

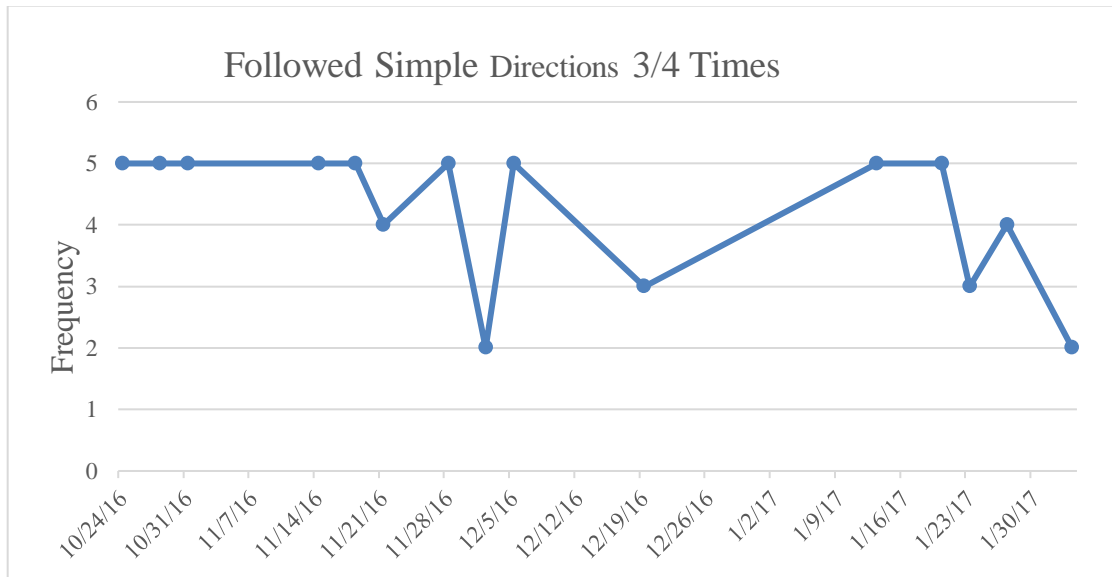


Figure 12. The Child’s Ability to Follow Simple and Familiar Directions  $\frac{3}{4}$  Times Successfully.

Throughout the study, E participated in the *Early Start Denver Model* (ESDM), as part of his Early Intervention protocol. E’s ESDM Data Sheets and Outcomes charted his growth from the first ESDM session recorded on October 28, 2016. E’s ESDM consisted of 11 goals, which he encountered with varying degrees of success. Each outcome centered around his social emotional progression of engagement with others through self-regulation. For the purposes of this study, focus was explicitly spent on E’s behavioral

goals as the direction of this piece was to determine the efficacy of sensory integration strategies to help with the hindrance of tantrums (extreme behaviors).

E had three ESDM behavior goals. The first one, “E will share and play functionally with materials within two feet of his brother without pushing, hitting, kicking, or biting for 10 or more minutes with adult control of materials on  $\frac{3}{4}$  consecutive days with verbal cues”. He began sharing materials for five minutes with minimal adult control, and was inconsistent in his ability to do so. There was an instance toward the beginning of the study, where E needed moderate adult control, but by November 14th, he was able to engage with his brother for 8-10 minute intervals for most of our session, on November 18<sup>th</sup>, he could do so for 10 or more minutes consistently. He was inconsistent with this skill, had a number of backslides, but a number of successes as well. He continued to work on consistency with positive engagement with his brother.

E’s second ESDM behavior goal, “E will transition from a preferred activity to a less preferred activity (eg. diaper change, outside to inside, etc.) within one minute, with visual cues with three different people/ settings over  $\frac{3}{4}$  consecutive days”. E initially began the ESDM with a baseline of an inability to transition to an unwanted activity, even with full physical prompts. As time progressed, E was initially able to successfully transition with full physical prompts on October 31, 2016, to increased success at being able to do so  $\frac{3}{4}$  times with only verbal prompts on November 14, 2016. He was inconsistent with his achievement of this outcome; depending on the day or extraneous stimuli, E achieved unpredictable and varying results.

E's third and final ESDM behavior goal, "E will express frustration vocally or through gestures rather than tantruming or hitting when an adult says "No" or "Stop" (or other triggers), within close-proximity in 2/3 opportunities for three different people/settings over 3 consecutive days". He began inhibiting his actions using a vocalization/gesture occasionally to quickly communicating 2/3 times independently. This success at appropriate engagement was short-lived, and extremely limited throughout the protocol.

## **Chapter 5**

### **Discussion**

#### **Review**

This study examined the success of a young boy seen during early intervention (EI) home visits with his young mother. When the early intervention visits began, the subject (E) and his brother ran around the room, screaming, throwing things, tantruming, and crashing. E was reported to consistently physically hurt his younger, and much smaller brother, K, and this caused their home life to be rather unpredictable and tumultuous. E was thought to be on the autism spectrum, although undiagnosed, and his family struggled to help him to find success with engagement, reciprocity, and self-regulation so that he was able to have his needs met so as to limit his frustration; hoping that he would use words instead of negative physical behaviors and tantrums, which had been a constant thread in his young life.

According to data collected, it was evident that for E, sensory integration strategies were successful in lessening his tantrums. E was unable to self-calm so that he could participate in adult-directed activities during appropriate reciprocal interactions. The sensory strategies that were used varied in response to the child's needs. Consistency in the use of sensory strategies was key. When the family missed multiple EI visits, the child's success appeared to backslide. During that time, his consistency of routines appeared to be diminished as well. This may have also caused an increase in tantrums. The developmental interventionist worked with the child's mother to establish successful

routines within the family home, in order to incorporate the sensory strategies that proved successful as part of the intervention.

As discussed in the study by Weatherston, Ribaud, & Glovak (2002), the importance of a nurturing relationship between parent and child was key to familial success. In the current study, the interventionist repeatedly encouraged the child's mother to implement sensory strategies to help with his engagement, lessening of tantrums, and the limiting of his negative behaviors, especially toward his younger brother, which became a dangerous aspect to his aggressive behavior.

Difficulty meeting a child's sensory needs may lead to a disconnect between parent and child. Before all else, figuring out how to meet the needs of such child, may start with the integration of purposeful positive interactions between them and the others in their lives (Weatherston et al 2002). Unmet sensory needs may have been at the root of the tantruming. Once sensory strategies were implemented, the child showed increased successful engagement. When sensory strategies were not implemented with consistency, the child suffered from extreme melt-downs.

The study by Tomchek and Dunn (2007) found that children with ASD struggled with tactile, taste, smell, and movement sensitivity, were either under responsive or sensation seeking, struggled with auditory filtering (level of distraction), presented with low energy, and had visual/ auditory sensitivity (may have responded unfavorably to loud noises or movement). In almost all areas the children with autism suffered with sensory issues significantly more than their typically developing peers. Struggles were evident

for the child in this study, but as evidenced by the graphs in Chapter 4, this child began to find increased success when his sensory needs were met.

### **Limitations**

A variety of variables may have contributed to spikes in tantruming behavior(s). The results of the *Sensory Profile* (Dunn 1999), examined both before the study began, and after its conclusion, did not show any significant differences in the results, but when sensory strategies were implemented during home visits, as needed, the child found overall success with limiting his tantrum behaviors. Limitations included the fact that only one child was included in the study and visits were not consistent due to cancellations by both practitioner and the child's family. In addition, it is difficult to determine which sensory strategies were most effective since they were varied in response to the child's needs. Success was also affected by family dynamics and mood on a particular day.

### **Implications for Practice**

Possible next steps may include a wider sample size needed to establish more concrete results by comparison of multiple subjects. Comparing each of the different sensory strategies used and their corresponding efficacy for each child, as compared to their specific results and struggles as according to each child's *Sensory Profile* (Dunn 1999), may help to streamline the results.

The results of the study implied that this child was successful with his responsivity to the sensory strategies that were utilized. As this child enjoyed noted success as his sensory system was met with appropriate sensory strategies, he also



struggled when such strategies were not present. Using appropriate sensory strategies in a manner befitting this particular child appeared to help the child to balance his needs, and may be helpful to further subjects struggling in the same area(s).

### **Future Studies**

Although this study was successful with the child in question, future research may be needed in order to determine if sensory strategies may reduce tantruming to increase positive familial interactions. Other studies may incorporate additional or lesser sensory strategies, or attempt to stick to specific strategies, as this study used varied implementation based on the specific needs of the subject. A larger sample size was recommended to prove efficacy. Previous research indicated mixed results, most of which established increased success with a variety of engagement opportunities, reciprocity, body awareness, limited tantruming, and increased abilities to engage in tactile, visual, taste, auditory, and other sensory struggles due to the implementation of sensory strategies. For a child with special needs, incorporating sensory strategies early on may be the difference in later success or struggle within future schooling. Strategies in place may continue, change, lessen, or cease as needed as the child grows. The knowledge taken from this study may be best used to remind parents and educators the importance of truly meeting a child's needs to limit frustration and foster success.

### **Conclusion**

This study examined the question: How can sensory strategies reduce tantruming to increase positive familial interactions? It touched on the areas that may have been detrimental to family life, and other areas of struggle within the family unit, as correlated

to difficulties with sensory processing. As evidenced by the charts of struggle and success in each area noted, this particular child was most successful when his sensory needs were met, as when they weren't, he tantrumed, displayed negative behaviors, and caused familial strife.

## References

- Ayres, A. J. (1989). *The Sensory Integration and Praxis Tests*. Los Angeles, CA: Western Psychological Services.
- Baranek, G. T. (2002). Efficacy of Sensory and Motor Interventions for Children with Autism. *Journal of Autism and Developmental Disorders*, 32(5), 397-422.
- Baranek, G. T., David, F. J., Poe, M. D., Stone, W. L., & Watson, L. R. (2006). Sensory Experiences Questionnaire: Discriminating Sensory Features in Young Children with Autism, Developmental Delays, and Typical Development. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 47, 591-601.
- Ben-Sasson, A., Cermak, S.A., Orsmond, G.I., Tager-Flusberg, H., Carter, A.S., Kadlec, M.B. & Dunn, W. (2007). Extreme Sensory Modulation Behaviors in Toddlers with Autism Spectrum Disorders. *American Journal of Occupational Therapy*, 61, 584-592.
- Bolanos, C., Gomez, M., Ramos, G. & Rios del Rio, J. (2016). Developmental Risk Signals as a Screening Tool for Early Identification of Sensory Processing Disorders. *Occupational Therapy International*, 23(2), 154-164.
- Bundy, A.C. & Murray E.A. (2002) Sensory Integration: A Jean Ayres Theory Revisited, in Bundy, A.C., Lane, S.J. & Murray, E.A. (Eds). *Sensory Integratio: Theory and Practice (second edition)*. Phildelphia: FA Davis Co, 3-29.
- Critz, C., PhD, CPNP, Blake, K., BS, OTL/R, & Nogueira, E., RN, MSN (2015). Sensory Processing Challenges in Children. *The Journal for Nurse Practitioners*, 11(7), 710-716.
- Dunn, W., PhD., OTR, FAOTA & Daniels, D., M.A. CCC-SLP (2002). *Infant/ Toddler Sensory Profile*. USA: Pearson.
- Dunn, W., PhD., OTR, FAOTA, & Daniels D.B., M.A., CCC-SLP. (2002). *The Infant/ Toddler Sensory Profile* [Testing Tool]. USA.
- Dunn, W. (2002). *Infant/ Toddler Sensory Profile manual*. New York: Psychological Corporation.
- Dunn, W. (1997). The impact of sensory processing abilities on the daily lives of young children and their families: a conceptual model. *Infants and Young Children*, 9(4), 23-35.
- Dunn, W. (1999). *The Sensory Profile*. San Antonio, TX: Psychological Corporation.

- Graven, S. N., & Browne, J.V. (2008). Sensory Development in the fetus, neonate, and infant: Introduction and Overview. *Neonate and Infant Nursing Reviews*, 8, 169-172. <http://dx.doi.org/10.1053/j.nain.2008.10.007>
- Mitchell, A. W., Moore, E. M., Roberts, E. J., Hachtel, K. W., & Brown, M. S. (2015). Sensory Processing Disorder in Children Ages Birth -3 Years Born Prematurely: A Systematic Review. *American Journal of Occupational Therapy*, 69(1), 1-11. doi:10.5014/ajot.2015.013755
- Mullen, E. M. (1995). *Mullen Scales of Early Learning manual*. Circle Pines, MN: American Guidance Service.
- Parham, L. D., Cohn, E.S., Spitzer, S., Koomar, J.A.; et al. (2007). Fidelity in Sensory Integration Intervention Research. *The American Journal of Occupational Therapy*, 61.2, 216-227.
- Perez-Robles, R., Doval, E., Ma Claustre, J., da Silva, P., Papoila, A.L., & Virella, D. (2012). The Role of Sensory Modulation Deficits and Behavioral Symptoms in a Diagnosis for Early Childhood. *Child Psychiatry Human Development*, 44, 400-411. doi 10.1007/s10578-012-0334-x
- Pfeiffer, B. A., Koenig, K. Kinnealey, M., Sheppard, M., Henderson, L. (2011). Effectiveness of Sensory Integration Interventions in Children with Autism Spectrum Disorders: A Pilot Study. *The American Journal of Occupational Therapy*, 65(1), 76-85.
- Reynolds, C. & Reynolds, K.S. (2010). A Study of the Effectiveness of Sensory Integration Therapy on Neuro-Physiological Development. *The British Institute for Learning Development*, 1-19.
- Rogers, S.J., & Dawson, G. (2010). *ESDM [Curriculum]*. New York, New York.
- Roley, Smith, S., Mailloux, Z., Parham, L.D., Schaff, R. C., Lane, C. J., et al. (2014). Sensory Integration and Praxis Patterns in Children With Autism. *The American Journal of Occupational Therapy*, 69(1), 1-8.
- Siaperas, P., Ring, H., McAllister, C., Henderson, S., Barnett, A., Watson, P., & Holland, A. (2011). Atypical Movement Performance and Sensory Integration in Asperger's Syndrome. *J Autism Dev Disord* 42(5), 718-725.
- Sniezyk, Carolyn J., MS, BCBA, & Zane, Thomas L., PHD, BCBA (2015). Investigating the Effects of sensory Integration Therapy in Decreasing Stereotypy. *Hammel Institute of Disabilities*. SAGE. 30 (1) 13-22. doi: 10.1177/1088357614525663

- Schaaf, R.C., Benevides, T., Mailloux, Z., Faller, P., & Hunt, J.(2014) Intervention for Sensory Difficulties in Children With Autism: A Randomized Trial. *Journal of Autism and Developmental Disorders* 44(7) (1493-1506).
- Schaaf, R. C., Benevides, T., Mailloux, Z., Faller, P., Hunt, J., van Hooydonk, E., Kelly, D. (2013). An Intervention for Sensory Difficulties in Children with Autism: A Randomized Trial. *Journal of Autism and Developmental Disorders*. 44, 1493-1506.
- Schaff, R. C., Hunt, J., Benevides, T. (2012). Occupational Therapy Using Sensory Integration to Improve Participation of a Child with Autism: A Case Report. *American Journal of Occupational Therapy*, 66, 547-555.
- Sparrow, S. S., Cicchetti, D. V., & Balla, D. A. (2005). *The Vineland Adaptive Behavioral Scales II: Survey Forms Manual, 2<sup>nd</sup> edition*. Circle Pines, MN: American Guidance Service.
- Weatherston, D. J., Ribardo, & Glovak, S. (2002). Becoming Whole: Combining Infant Mental Health and Occupational Therapy on Behalf of a Toddler with Sensory Integration Difficulties and His Family. *ZERO TO THREE: National Center for Infants, Toddlers, and Families*. 15(1), 19-28.
- Tomchek, S. D. & Dunn, W. (2007) Sensory Processing in children with and without autism: A comparative study using the Short Sensory Profile. *American Journal of Occupational Therapy*. 61. 190-200.