Strange Sensations: Dealing Effectively with Sensory Issues in the Early Childhood Classroom

Elizabeth English
Otterbein College
Westerville, Ohio

Keywords
Sensory Integration Disorder, Autism, Occupational Therapy, Sensory Integration Therapy

Abstract
This article focuses on Joel, a three-year-old preschool child with autism. Joel's sensory defensiveness kept him from appropriately engaging with peers and in classroom activities. To help Joel function more effectively in the classroom, I completed a functional behavior analysis based on careful observation over three weeks. I implemented an intervention plan that included sensory integration therapy and charted Joel's engagement before and during the intervention. After sensory integration therapy, Joel exhibited less stereotyped behaviors and stayed appropriately engaged with peers and in classroom activities for longer periods of time.

Table of Contents

Introduction

Imagine that there is a child in your classroom who appears to be hyperactive, is constantly on the go, and bumping into furniture and his peers. He could be described as "an accident, waiting to happen." Then you look at another student; she is quiet and withdrawn. It seems strange that the slightest bump sends her into an intense tantrum, screaming "ouch" and retreating from her peers. No one hits her so why is she so sensitive? Look again. There is a third student who was diagnosed with AD/HD. He is easily distracted and becomes frustrated with the simplest of instructions. He's on medication, but it just doesn't seem to be help.

What do these three students have in common? They all have difficulty processing, regulating, modulating, and organizing sensory input in their central nervous system. The term applied to children like these three is Sensory Integration Disorder (SID), a handicapping condition that affects every aspect of their lives, at school and at home (Ayres & Tickle, 1980; Cross & Coster, 1997; Freidlander, 2008; Kranowitz, 1998; Kranowitz, 2003; Viola & Noddings, 2006).

Almost every student in my special needs preschool class experiences some level of difficulty with sensory integration problems. These young children are experiencing a much different sensory world than that of their "typically developing peers." For these children, the world can be a very overwhelming, frustrating, and fearful place in which to live.

Literature Review

> "Our children are more confident, relaxed, less fearful, better at interpreting their environment today than when we first started therapy"
>
> (Arnwine, 2005, p. 5)

SID is not an imaginary problem to explain misbehaviors in young children. It is a real neuro-biological disorder that affects how sensory messages are received, interpreted, organized, and answered in the brain. Think about how it would feel if even the slightest touch caused excruciating pain. Imagine trying to explain this to caregivers and parents and their reactions to such a seemingly absurd and unheard of diagnosis! There is a growing body of research that examines SID and recommends appropriate interventions for school-age children, such as Sensory Integration Therapy. However, there is not much information available for addressing the needs of preschool children diagnosed with SID. So, how can a teacher more effectively deal with sensory integration issues in the early childhood classroom and increase appropriate classroom engagement?

There is a need for more information on how to help these young students and their educators with coping skills, therapies, teaching strategies, and causal factors. This research is not groundbreaking but it is vitally important to the participant and others who struggle with the various and strange experiences caused by this problem. This research will help the families of exceptional young people to better deal with the daily challenges associated with the disorder.

What is Sensory Integration Disorder?

SID, a perplexing condition, is also referred to as Sensory Integration Dysfunction, Sensory Processing Disorder or Sensory Processing Dysfunction (SPD). While everyone suffers from occasional glitches in their sensory systems, as a result of illness or over-excitement, those diagnosed with SID have significant, frequent problems that interfere with their daily routines (Kranowitz, 1998). While there is some inconsistency among experts regarding the percentage of the population currently dealing with some degree of sensory processing issues, most agree that at least 5% of the general population and up to 30% of children have some level of SID (Ben-Sasson, 2007; Kranowitz, 1998; Schneider, 2008).

SID affects the brain and central nervous system, although it is not classified as “brain damage” (Kranowitz, 1998). In a properly functioning nervous system, the five senses in the human body send signals via neurotransmitters in the nervous system to the brain and the brain sends messages back to either encourage or inhibit a reaction (Arnwine, 2003; Kranowitz, 1998; Kranowitz, 2003). These are the reactions that cause a person to pull their hand away from a hot stove or to jump out of the way of a nearby car when it blares its horn or comes too close. These are the same reactions that help one to discriminate between a soft, fuzzy blanket and a rough, wool one; to smile at the comforting odor of freshly baked cookies or to run to the kitchen when the smell of smoke starts issuing from the oven. However, these are not the only messages our central nervous system needs to process, organize and counter.

The human body has three lesser known senses that can become disorganized. The three systems are referred to as the “near” senses since the stimulus comes from inside the body, not the environment. The near senses are the tactile system, the vestibular system, and the proprioceptive system. The tactile system includes whole body touch sensations, such as pressure, pain and temperature, through the skin. It helps one to discriminate who, what, and where we are touching or are being touched. The second is the vestibular system which signals balance, movement and gravity sensations to the brain, through the inner ear. If one becomes disoriented and dizzy, this system signals the brain to respond appropriately. The final near sense is the proprioceptive system which monitors movement and body position through the muscular and skeletal systems. This system helps one to know how hard to grasp or kick an object, when to let go and allows one to move smoothly and efficiently (Arnwine, 2007; Bogdashina, 2003; Kranowitz, 1998: Kranowitz, 2003).

What is Sensory Integration Therapy?

The key feature of an appropriate intervention plan for students like these is the use of SID therapy techniques. This is a process of feeding a child's sensory appetite with appropriate sensory experiences. The rationale for this approach comes from the work of Dr. A Jean Ayres who first described sensory integration/processing disorders (Kranowitz, 1998). Efficient sensory integration is the basic foundation for all learning - motor, academic and adaptive behaviors. Learning and socialization are difficult for those who are not having their basic sensory needs met. Kranowitz discusses success stories of children who have learned to deal with their over-loaded, over-worked, disorganized sensory processing systems and have been able to greatly decrease their "symptoms." Another author/researcher and parent of a "sensory kid" states that she and several friends began SI therapy at the same time and now "Our children are more confident, relaxed, less fearful, better at interpreting their environment today than when we first started therapy" (Arnwine, 2005, p. 5). Proper development and functioning of the sensory systems is important because "By the time a child is ready for preschool, the blocks for complex skills should be in place" (Kranowitz, 1998, p. 68). What if these blocks are misplaced or missing entirely? Without treatment, sensory processing and integration issues will interfere with a child's coping skills and interactions. Sensory issues are not a phase or something they will outgrow. Many researchers' suggestions to parents, caregivers and teachers are to "provide the child with a well-balanced sensory diet" (Kranowitz, 1998, p. 50).

There are many different activities that are included in SI therapy to help activate the vestibular, tactile, and proprioceptive systems and send "good" sensations through the nerves to help children organize their disorganized sensory systems (Kranowitz, 2003; Arnwine, 2005). One is "Animal Walk" where the student is asked to pretend to be a certain animal and s/he moves about the room in a similar way to the animal. Another activity is to help the student pretend to be a "Hamburger" that needs put together with the student acting as the hamburger patty. Gym mats simulate the bun, while a series of pats and rubbing simulate the addition of condiments and toppings for the hamburger. Messy play activities – flour, cornstarch gak, playdoughs - are key to good SID therapy. The ultimate goal of SI therapy is to help the child move from a disorganized, fearful state of sensory processing to a more efficiently functioning state by guiding the child in exploring his/her senses in a safe, non-threatening manner. Therapy activities incorporate fun, comfortable, pleasurable experiences with other activities that can be unnerving or disconcerting for the child. By combining the known with the unknown or misunderstood activities, the child is more motivated to experiment with and learn about the new, unfamiliar sensations. Through therapeutic activities, the child learns how to help organize his/her sensory systems and how to safely explore new situations, without excessive stress.

Method

This study focuses on three-year old Joel, who attends a suburban Columbus, Ohio, special-needs, early childhood program. He was diagnosed with autism at the age of two by the autism clinic at The Ohio State University. Joel attends several therapy and play sessions throughout the week to help him develop his social, motor, and language skills. Joel was evaluated by the local education authority (LEA) and has an individualized education plan (IEP) in place. Joel is an only child who resides with both parents.

At the beginning of the study, Joel had been attending the early childhood preschool program for three months. He is one of eight students in his class who attend for 2 ½ hours a day, Monday through Thursday afternoons. This program is sponsored by the local Board of MR/DD, which serves up to 64 total students, aged 12 months through 3 years, who have a wide array of confirmed or suspected developmental delays and disabilities. Joel was selected as the subject for this study because of his autism diagnosis and the sensory characteristics that result. His mother's verbal permission was obtained in a face-to-face conversation of the study at the school.

Joel was observed by his teacher, the sole investigator, over one week, with the Infant-Preschool Play Assessment Scale (1996) within the first thirty days of enrollment. Results indicated that Joel had difficulty with social interactions and engagement in classroom activities. Joel exhibited stereotyped behaviors and tended to flap his hands, suck his thumb or said "no, no, no" when asked to make a choice or help clean up. He was not easily redirected to appropriate activities and required almost exclusive attention from the teacher, aide, or therapist in the classroom. Instead of appropriately expressing approval or disapproval of activities or snack, he pushed away or dumped objects or food to the floor. Joel refused to make eye contact with anyone and ran from peers and adults who attempted to interact with him. Joel's attention span was very short and he had trouble sitting in a chair for most activities. However, he selected very specific toys that he preferred to the exclusion of most of the others in the classroom, especially cars with noises. He was very hesitant to engage in everyday classroom routines and activities. These behaviors made it very difficult to complete Joel's initial evaluation.

Functional Behavior Assessment

A functional behavior assessment (FBA) was used to identify the function of Joel's behavior. A FBA is a behavior management tool that is based on the assumption that all challenging behaviors are not random or unpredictable, but have a specific function (Barbetta, Long, & Bicard, 2005; Kaiser & Rasminsky, 2003; Neilsen & McEvoy, 2004). It was developed by behavioral psychologists to help those people dealing with challenging behavior in children to design more effective interventions (Kaiser & Rasminsky, 2003). It is now required by the

Individuals with Disabilities Education Act that IEP teams utilize an FBA when considering where to place students with disabilities who exhibit behavior challenges (Neilsen & McEvoy, 2004).

When conducting an FBA, one must look at the child's environment and behaviors closely to determine the A-B-Cs of the challenging behavior (see Table 1):

Table 1

The ABCs of an FBA

A	B	C
ANTECEDENTS Antecedents are the events that lead up to or trigger the challenging behaviors. What occurs just prior to the challenging behavior? Researchers suggest that antecedents can incorporate task demands, transition demands, increasing or avoiding sensory input, avoiding or to acquire attention, preferred activities, a desired object or candy (Barbetta, et al., 2005; Kaiser & Rasminsky, 2003; Neilsen & McEvoy, 2004).	BEHAVIORS This refers to the behavior that is triggered by the antecedent. What challenging behavior is displayed in response? The descriptions of the behaviors should be clear and concise when taking notes. Describe the behavior so that others could observe, identify and measure the same behavior (Barbetta, et al., 2005; Kaiser & Rasminsky, 2003; Neilsen & McEvoy, 2004).	CONSEQUENCES Finally, C refers to the consequences that occur and help to reinforce the function of the challenging behavior (Barbetta, et al., 2005; Kaiser & Rasminsky, 2003; Neilsen & McEvoy, 2004). Consequences can be external, such as receiving attention from a familiar adult, or internal, such as increasing or decreasing sensory stimulation. What does the child get from acting this way?

Over a two-week period, Joel was observed by this teacher investigator throughout the school day in various settings, such as circle time, free choice play, art, and gross motor time, to analyze Joel's challenging behaviors. In examining his FBA, it was determined that several of the antecedents were related to his sensory needs. When the classroom environment became overly stimulating, such as too loud or a play area too crowded, he would leave and seek out a calming, familiar activity. When task demands, such as coming to sit at the table, were too much for Joel, he would leave the area, refuse to participate in the activity or ran away from adults and peers alike. Joel's sensory "defensiveness" kept him from engaging with peers and in classroom activities. At other times, Joel was distracted by items and activities that provided sensory sensations and was unwilling to interact with others. In short, when Joel became overwhelmed by the activities, materials and peers in the classroom, he tried to avoid the overwhelming

stimuli. The challenging behaviors – sensory seeking, seeking out and engaging in preferred activities and refusal to engage in classroom activities – functioned as a "security blanket" that soothed his disorganized sensory system and over-stimulated body.

Interventions

Using the new insight gleaned from the FBA, a new intervention plan was designed to help Joel meet his sensory needs more effectively so he could become more successful in the classroom. The objective of the intervention plan was to increase Joel's engagement in child- and adult-structured activities that help develop social, cognitive, fine motor, gross motor, and communication skills. These behaviors include: (1) Joel allowing others to play with and near him during child-structured play; (2) Joel sitting with his peers during Circle Time and mimicking or approximating the motions of the songs, poems, finger plays, and dances; (3) Joel listening quietly and respond appropriately to stories read aloud for short periods of time; (4) Joel sitting at the table and making yes/no decisions to offerings of snack and choice of activities; and (5) Joel using cooperative play skills, turn taking and sharing with adult support, if needed. This is the behavior that would be measured and used to determine the success of the intervention plan.

The intervention plan included several features that are already used by occupational and sensory integration therapists in treating children like Joel. This type of therapy focuses on feeding the sensory hungry child a nutritionally balanced "sensory diet." The sensory behaviors will reduce and allow the student to concentrate on more academic and social related activities. Daily sensory activities were included and were presented in ways that supported Joel's needs and allowed him to expand his sensory knowledge. Joel's favorite toys, a handful of plastic cars, were used to entice Joel to try new, unfamiliar textures and activities. For example, Joel would explore new textures by driving his toy cars across playdoh, through shaving cream, or make tracks with paint. Inevitably, some would get on his hands and, over time, he became less reactive to the stimuli. If a less appropriate behavior was exhibited, Joel was reminded to attempt an activity "one more time" or redirected to a more appropriate activity. Joel was also encouraged to ask, verbally or with gestures, for appropriate sensory activities. Once Joel's sensory appetite was satisfied, he was able to focus on learning more appropriate social and cognitive skills to help him increase his engagement in classroom life.

The sensory activities were also used in combination with both redirection and positive reinforcement to explore the effectiveness of the sensory activities. For example, instead of simply redirecting Joel to make a more appropriate choice, he was asked to Animal Walk back to his activity of choice. Thus he received the verbal redirection with a sensory activity. High-fives, big hugs and quick pats on the back were the only sensory input activities combined with verbal positive reinforcement. It is important to note that sensory activities should not be used

solely as positive reinforcement as the sensory input becomes a basic need for students with SID (Kranowitz, 1998).

Data Collection & Procedures

I, the sole researcher and observer, employed the A-B single-subject research design, where data are collected at "baseline" or before any interventions are implemented. Behavior is not modified, only observed and recorded in a quantitative manner. The intervention is determined and implemented, and then more data are collected in the same method and graphed to allow for comparisons (Fraenkel & Wallen, 2009). The data collected will show whether or not a certain intervention is effective. In order to measure the change in appropriate engagement behaviors, an interval recording method was implemented for both the baseline and intervention measures. Joel was observed in one 15 minute session using one minute intervals at least two days per week. The 15 minute session started at 2:30PM, continuing through 2:45PM and included Free Choice Play Time. During Free Choice Play Time, students are given the choice to engage in two or three different activities designed to improve fine motor, language or sensory skills.

Observable "target" behaviors were defined for this time period. Specifically, Joel was considered to be appropriately engaged and on-task if the following criteria were met: First, Joel must be using the toys, materials, or activity in a functional and appropriate manner. Second, Joel must be practicing cooperative play skills, taking turns and sharing materials or toys. Third, Joel must allow his peers to play near him and interact in an appropriate manner without hitting or snatching toys from peers. Fourth, Joel must make appropriate choices from the toys made available that day by the teacher; toys that remain on the shelves are not available.

Throughout the 15 minute observations, a timer called a Motivaider was used to provide a cue every minute to observe Joel's behavior. If he was exhibiting appropriate engagement per the established definition, then credit was given for that one minute-interval and indicated by a check mark on the recording sheet. If appropriate engagement behaviors were not observed, no credit, or an "X" was given. At then end of the observations, the percentage of intervals that Joel engaged in appropriate activities was calculated, based on the number of intervals where the behaviors were observed, divided by the total number of intervals (15) and then converted to a percentage (multiply by 100). Additional observational notes were recorded throughout the 15 minute sessions. Which activities Joel chose, possible antecedents to off-task behaviors, and whether Joel was interacting with or playing near peers were noted.

Results

Data on Joel's engagement level were collected over six weeks, with two to three sessions per week, for a total of 18 sessions. Joel's engagement was observed using interval recording and converted to percentages; therefore the possible range was 0-100%. During the baseline, data on Joel's classroom engagement were collected during five sessions, over a two-week period. The baseline data is a record of Joel's behavior free of interventions or redirection from adults in the classroom. He was given the opportunity to make his own choices. The intervention plan was implemented and Joel's classroom engagement was recorded for twelve more sessions during the last four weeks of the study. During the intervention sessions, Joel was given a combination of sensory experiences to calm his body and mind, redirection, and positive reinforcement and was required to make a choice from the available activities. If Joel chose to engage in appropriate activities, he was given verbal positive reinforcement or verbal positive reinforcement with a sensory element (high-fives, hugs, pat on the back). If he chose to engage in inappropriate activities, redirection or redirection plus a sensory experience were provided to help Joel get on-task. Pure sensory activities were supplied daily to help him develop his sensory skills and expand his sensory environment. The data collected are shown in Figure 1.

Figure 1

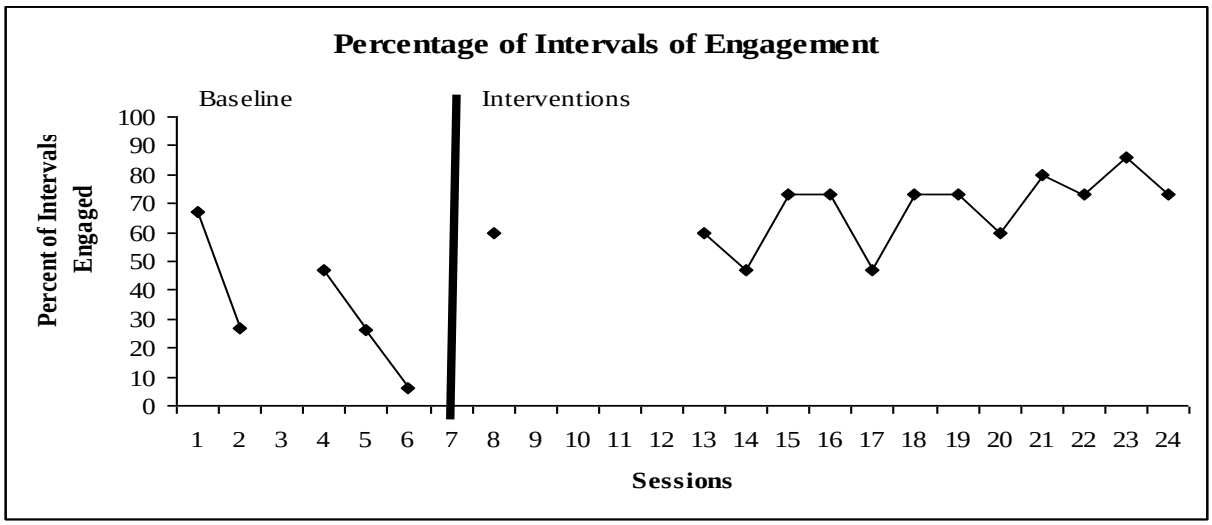

Figure 1 illustrates Joel's engagement in classroom activities. During baseline, the mean percentage of intervals of engagement was 34.6% with a range from 6% through 67%. The level of engagement seemed to vary depending on his mood and the toys or activities available. During the first session, Joel had just returned from a 10-day family trip to Florida for a funeral. The activities available that day included the large trucks and cars in our electronic toy section.

Joel spent the majority of the Free Choice Play Time driving trucks around the room. He disengaged from the activity when a peer took a car that Joel had put aside, running and flapping his hands. Other days, Joel avoided all activities, such as Session 6. Joel ran from choice to choice, dumping the available toys on the floor, then finding and engaging with preferred toys, the trucks. He also decided to explore this researcher's insulated mug that was sitting beside her and attempted to dump it.

Once the interventions were utilized, the mean percentage of intervals Joel spent engaged increased to 68.2%. The percentage of engagement ranged from 47% through 86%. Overall, he was able to function better, even when his preferred toys were not available. During 8 of the 12 intervention sessions, Joel maintained appropriate engagement for at least 5 minutes. The most effective and efficient intervention to help Joel return to appropriate activities involved sensory therapy experiences or a combination of teacher redirection or positive reinforcement and sensory experiences. 61.9% of the interventions included some form of sensory integration therapy, with Animal Walk and Big Moves as Joel's preferred sensory refocusing activity. Joel also maintained positive appropriate engagement for longer periods of time when positive reinforcement with sensory elements were provided. Joel also participated in an increasing number of messy play activities which also contributed to his increased classroom engagement.

Even with the intervention plan in place, Joel had some lower engagement days, as illustrated in the 14th and 17th sessions. Joel spent most of these sessions dumping toys from shelves, running from peers and adults and refusing to clean up. When adults approached, Joel would simply drop or throw himself to the floor. Often on these days, he would not tolerate any of the regular sensory routines and seemed to need more auditory stimulation as he continued to dump hard plastic and wooden toys from their baskets. The family reported that Joel had not slept well the night before or had not napped the day of these sessions.

Limitations

There are several days of missing data. Sessions 9 – 11 are missing since Joel did not attend due to illness, therefore no data are available. No data are available for session 12 as well because the preschool was on a field trip to the local zoo.

Some researchers would question the "missing" data that show Joel returning to baseline behaviors, as in the A-B-A single-subject research design. This would strengthen the design of the study and further show the effectiveness of the intervention by controlling for extraneous factors, such as natural maturation (Fraenkel & Wallen, 2009). The A-B design was appropriate for this study due to the subject's age and disability. The data were collected over a relatively short period of time, so any risk that maturation

was more of a factor than the intervention is low. It was also thought that allowing Joel to return to his baseline behaviors for even a short amount of time may be detrimental to his overall development and success in school. The goal was to help him expand his senses and as a teacher, I did not want to give him the idea that inappropriate behavior would be tolerated.

Conclusions

By the end of the study, Joel was reassessed with the Infant-Preschool Play Assessment Scale (1996) and was found to be more responsive in the classroom. After SI therapy, Joel exhibited less stereotyped behaviors. He began using words and gestures to express appropriately approval and disapproval and rarely dumped or pushed away toys. Joel now allows peers to play near him and has attempted to make eye contact with peers. He now maintains eye contact for at least 2 seconds or more with adults. He participates in art projects, shares toys, and is occasionally observed to work cooperatively on tasks with specific peers. Joel has also learned to sit at circle and table activities and has expanded his attention span. With SI therapy, Joel's classroom engagement with both activities and peers has increased and he has become a functioning member of the class, almost indiscernible from his less disabled peers.

These results further illustrate the importance of providing a rich sensory diet to students with sensory integration problems. Whether they are exhibiting sensory seeking or sensory avoiding behaviors, these students need to learn to balance out their sensory systems in order to be successful in other areas of learning. An organized and efficient sensory processing system serves as the building blocks for all other learning (Kranowitz, 1998). With appropriate sensory interventions, Joel and other children with the same disorder are able to stay focused on a wider array of activities for longer periods of time and grow to be more relaxed, more confident, and less fearful. Most importantly, these children develop the skills to interpret more effectively their environments and function better in society (Arnwine, 2005; Kranowitz, 1998).

Although this case study is not widely generalizable, the results imply that early childhood educators, child care providers, and therapists should consider including SI therapy in special education and individualized education programs to increase the overall effectiveness of other interventions. Assuming that sensory integration does support all other learning, helping children with these issues is of the utmost importance in that early intervention will increase their chances of educational success. The earlier a student with special needs receives specialized support, the better.

This study will need to be replicated with a variety of students, with a variety of disabilities, in several different types of classrooms before the results can be reliably generalized to all students

with disabilities stemming from sensory issues. Most current research focuses on older students, those in elementary school or higher. Additional research is needed to determine the most effective techniques for younger students, from birth through four years of age. Imperative to the research is the need to provide parents, educators, and others with the most up-to-date, effective, and specialized therapies and treatments to help these children develop and reach their own potentials. All children have the right to the best educational practices available.

Works Cited

Arnwine, B. (2005). *Starting sensory integration therapy: Fun activities that won't destroy your home or classroom.* Arlington, TX: Future Horizons, Incorporated.

Ayres, A. J. & Tickle, L. S. (1980). Hyper-responsivity touch and vestibular stimuli as a predictor of positive response to sensory integration procedures by autistic children. *The American Journal of Occupational Therapy, 34*(6), *375-381.*

Barbetta, P. M., Leong Norona, K., and Bicard, D. F. (2005). Classroom behavior management: A dozen common mistakes and what to do instead. *Preventing School Failure, 49*(3), *11-19*

Bishop, S., Gahagan, S., & Lord, C. (2007). Re-examining the core features of autism: A comparison of autism spectrum disorder and fetal alcohol spectrum disorder. *Journal of Child Psychology and Psychiatry. 48*(11), *1111-1121.*

Bogdashina, O. (2003). *Sensory perceptual issues in autism and Asperger Syndrome: Different sensory experiences-different perceptual worlds*. London: Jessica Kingsley Publishers.

Cross, L. A., & Coster, W. J. (1997). Symbolic play language during sensory integration treatment. *The American Journal of Occupational Therapy, 51*(10), *808-814.*

Flagler, S. L. (1996). Infant-Preschool Play Assessment Scale. Chapel Hill, NC: Outreach Project, Inc.

Fraenkel, J. R. & Wallen, N.E. (2009). *How to design and evaluate research in education.* New York: McGraw-Hill Higher Education.

Friedlander, D. (2008). Sam comes to school: Including students with autism in your classroom. *The Clearinghouse, 82*(3), *141-144.*

Greenspan, S. I. (2004). Working with the child who has sensory integration disorder: Helping the child who has difficulty processing sensations, including sound and touch. *Scholastic Early Childhood Today, 18*(7)*, 20-21*.

Kaiser, B. & Rasminsky, J. S. (2003). *Challenging behavior in young children: Understanding, preventing and responding effectively*. New York: Pearson.

Kranowitz, C. S. & Miller, L. J. (1998). *The out of sync child: Recognizing and coping with sensory processing dysfunction*. New York: Perigee.

Kranowitz, C. S. (2003). *The out-of-sync child has fun: Activities for kids with sensory integration dysfunction.* New York: Perigee.

Miller, D. (2007). A "rich diet" for learning: A multi-sensory approach that nourishes all children. *Exchange, September/October, 48-54.*

Neilsen, S. & McEvoy, M. (2004). Functional behavioral assessment in early education settings. *Journal of Early Intervention, 26, 115-131.*

Schneider, M. L., Moore, C. F., Gajewski, L. L., Larson, J. A., Roberts, A. D., Converse, A. K., & DeJesus, O. T. (2008). Sensory processing disorder in a primate model: Evidence from a longitudinal study of prenatal alcohol and prenatal stress effects. *Child development, 79*(1)*, 100-113.*

Tawney, J., W., & Gast, D. L. (1984). *Single subject research in special education*. Columbus Ohio: Charles E. Merrill Publishing Company

Viola, S., & Noddings, A. (2006). Making sense of every child. *Montessori Life, 4, 40-47.*