

SUPPORTING THE LITERACY NEEDS OF A CHILD WITH AUTISM AT HOME: A
PARENT'S PERSPECTIVE

A Doctoral Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

by

Stephanie J. Jenkins

May 2017

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Approved by Doctoral Dissertation Committee:

Dr. Laveria Hutchison, Chairperson

Dr. Wayne Emerson, Committee Member

Dr. Lee Mountain, Committee Member

Dr. Cameron White, Committee Member

Dr. Robert McPherson, Dean

College of Education

May 2017

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Abstract

Children with Autism Spectrum Disorders have deficits in communication and language skills that cause many to struggle with reading comprehension skills. Research-based interventions and strategies effective for improving comprehension skills are needed not only for educators but also for parents to use in a variety of home-based situations. This study utilized an autobiographical qualitative investigative case study design and posed the following research questions: 1) What research-based teaching strategies are effective for students with Autism Spectrum Disorders? and, 2) What at-home interventions increased reading achievement? The autobiographical qualitative case study was conducted to provide a detailed description of the identification process used to diagnose and to identify a 9-year old fourth-grade male student as having Autism Spectrum Disorder. The researcher, the mother of the case subject and a reading specialist, collaborated with teachers and community providers for one academic school year, collecting formal and informal evaluation artifacts and school records such as student work samples. This study also reviewed the history of autism identification, a brief history of special education legislation, and intervention practices for students with autism. The study revealed that the combination of self-selected reading materials by the 9-year old subject, fluency exercises, and directed reading and thinking activities at home, in addition to interventions provided at school, helped to increase the student's overall reading achievement. Children with Autism Spectrum Disorders vary markedly in ability. Consequently, interventions aimed at supporting unique strengths and weaknesses will vary. School, family and community supports are essential for providing an appropriate education for students with disabilities. Through understanding the

characteristics of a child with autism, parents and educators can make informed decisions about school structures that make a positive and meaningful impact on the functioning of children with Autism Spectrum Disorders.

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Chapter 1

Introduction

Across the nation, there has been a sharp increase in the number of children identified with Autism Spectrum Disorder (ASD). Currently, The Center for Disease Control (CDC) estimates that around 1 in 68 children have an Autism Spectrum Disorder. This spectrum of disorders can range from mild social, cognitive, and behavioral deficits to more significant intellectual and language disabilities; some children diagnosed with ASD are nonverbal (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014). Autism Spectrum Disorders have been reported in all racial, ethnic, and socioeconomic groups, and is approximately 4.5 times more common in boys (1 in 42) than in girls (1 in 89). The reason for the rise in the number of children diagnosed with the neurodevelopmental disorder is unknown. Research suggests that ASDs may have multiple causes due to the range of disorders included. Both biological and environmental causes have been explored. In the biological/genetic perspective, researchers have observed structural and chemical differences in the brains of diagnosed children (Boyles, 2011). Researchers using magnetic resonance imaging (MRI) at Stanford University have found differences in the gray matter of children with and without autism. The social communication and self-regulation networks in the brains of children with autism have a different organizational pattern than typically developing children (Boyles, 2011). MRI technology has enabled researchers to identify children with autism with 92% accuracy (Boyles, 2011).

Nevertheless, increased awareness and better detection may also play a significant role in the early identification, which could explain the increase in incidences. It is also

possible, however, that there has genuinely been a rise in the number of children on the autism spectrum (Mayo Clinic Staff, 2014).

The difficulties children with ASDs face socially, emotionally, and academically vary from child to child. Their unique abilities (and disabilities) impact their performance both inside and outside of our schools and classrooms. Together, both parents and educators must support the needs of our children. While special educators, psychologists, and specialists are professionally trained to work with children with disabilities, many parents and general education teachers are not prepared to support their children's academic needs. With the rise in numbers, and more and more children receiving support services in the general education classroom, many teachers and parents struggle to meet the needs of their children/students and would benefit from training in working with children with autism.

The subject of this case study is one such example. As a toddler, he struggled with language skills and began receiving speech therapy services by the age of 3. His parents also noticed sensory problems as well as repetitious behaviors. The speech therapist at the time recommended an autism evaluation, but the parents declined. His problems with communication and inability to socialize with others continued and became more noticeable through his early elementary years. By third grade, it was evident that there was more than a speech/language impairment causing his struggles with social interaction, communication, reasoning, and comprehension skills.

Problem Statement

Autism Spectrum Disorders impact how children socialize and perceive others due to significant deficits in language skills. Significantly delayed language skills not

only affect socialization and social interaction, communication, and behavior but they also negatively impact academic skills (Mayo Clinic Staff, 2014). Language skills are critical to reading achievement, especially reading comprehension. Deficits in receptive and expressive language skills are characteristic of children with Autism Spectrum Disorders (Ricketts, Jones, Happe, & Charman, 2013). Difficulties with language, understanding word meanings, acquiring basic reading and reading comprehension skills, as well as written language skills also affect a student's level of motivation and participation in class, their ability to make inferences, and their ability to take on other points of view (NCTE Executive Committee, 2014).

Also, frequently found in children with developmental disorders is hyperlexia. Hyperlexia is the ability to decode on grade level, but not understand what they read. (Randi, Newman, & Grigorenko, 2010). These children have well-developed to above average word recognition skills, yet their comprehension skills are well below the expected level; these skills did not develop simultaneously. Researchers suggest that this is due to a lack of the abstract reading skills needed for reading comprehension, which is also common in children with autism (Randi, Newman, & Grigorenko, 2010).

Since word recognition and oral language comprehension both contribute to skilled reading and are necessary, it is important to intervene and support students struggling to construct meaning from text early (Ricketts, Jones, Happe, & Charman, 2013). As students progress through school, reading requirements become more complicated, and the texts are much longer. Unfortunately, without intervention, struggling readers get farther behind, and skills become harder to remediate.

Research. Little research includes participants diagnosed autism in their studies to improve reading achievement. A search of the What Works Clearing House (WWC) using the filters “literacy” and “children and youth with disabilities” produced eleven results. Of those, nine showed positive or potentially positive evidence of effectiveness levels. Of the nine, Phonological Awareness Training and Dialogic Reading only assessed communication/language skills as the result of the intervention. Read Naturally measured reading fluency and writing achievement only for students with learning disabilities, and Spelling Mastery only assessed writing performance. Fast Track Elementary School and First Step to Success were intended for children identified with or at-risk for an emotional disturbance. The first had significant positive effects, while the later had indeterminate effects in reading achievement.

Of the remaining programs, Ladders to Literacy had three studies that met the WWC standard; one of the three studies focused on comprehension and had statistically positive effects. Peer-Assisted Learning Strategies (PALS) had two studies that met the WWC standard, and the studies had substantively important positive effects. Lindamood Phoneme Sequencing (LiPS®) had one study that met the WWC standard but was not rated because the study sample was not aligned with the protocol. Repeated Reading had two studies: the first had substantively important positive effects for grades 5-7. The second study had indeterminate effects.

For parents and educators looking to support their children/students at home, the search for an intervention with evidence of positive results is a challenging task. With the increase in the number of children identified, more research on specific methods for improving reading achievement for both parents/families and educators is needed.

Purpose of the Study

The purpose of this study was to analyze the process of assessing reading skills and providing effective intervention strategies for a struggling, unmotivated reader with Autism Spectrum Disorder. The researcher conducted a search of effective reading strategies for children with disabilities. The selected supports were used for one nine-week grading period. This self-study, conducted by the parent/researcher, analyzed strategies and methods used at home.

Significance of Study

This study provides a parent/researcher perspective on the home supports of a child with Autism Spectrum Disorder. The parent has a master's in special education, works as an educational diagnostician, and is a graduate student in the field of reading and literacy education. Parent-family perspectives regarding supports needed, used, and found effective, would benefit other families of students with learning difficulties.

Research Questions

1. What research-based teaching methods or strategies are effective for students with Autism Spectrum Disorder?
2. What at-home interventions increased reading achievement?

Overview of Methodology

A qualitative research method was used, specifically an autobiographical case study. Descriptive information (observations, notes, documents and reports, and parent-teacher conferences) provided through a qualitative design aided in the understanding of the participant at the heart of the study as well as his family. Other families in a similar scenario could benefit from the findings. The parental/researcher self-study design allows

the researcher to explore, document, and relay a personal perspective and data regarding at-home reading interventions to support a child with Autism Spectrum Disorder. Other documents including, but not limited to, the child's full and individual evaluation, school records, and informal assessment information were analyzed as well as observations and discussions from home remediation sessions. Finally, an analysis of empirical studies which include students with autism was reviewed.

Definition of Terms

The following terms were used throughout this study.

Hyperlexia. The term hyperlexia refers to the ability to decode on grade level, but not understand the text read; it is frequently used to describe children with developmental disorders (Randi, Newman, & Grigorenko, 2010).

Individualized Education Plan (IEP). The individuals with disabilities education improvement act define an IEP as a written statement of the child's present levels of academic achievement, their measurable annual goals, a description of how the child's progress toward mastering his annual goals will be measured, and when progress reports will be provided. The IEP also includes a statement describing which specific special education and related services the child needs to benefit from education, and the extent to which the child will participate with his nondisabled peers. The IEP also includes a statement of individual accommodations necessary for academic achievement, and the projected date for services to begin (Public Law 94-142).

Diagnostic and Statistical Manual of Mental Disorders (DSM-V). A classification and diagnostic manual published by the American Psychiatric Association.

Autism/Autism Spectrum Disorder (ASD). *The DSM-V* uses the term Autism Spectrum Disorder to describe a range of neurodevelopmental disorders. The term encompasses autism (previously referred to as infantile autism, childhood autism, Kanner's autism, high-functioning autism, or atypical autism), Asperger's Disorder/Asperger's Syndrome, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), and childhood disintegrative disorder.

Social-Emotional Reciprocity. *The DSM-V* describes social-emotional reciprocity as the normal back and forth conversation, sharing of emotions, or affect, the initiation and response to social interactions.

Neurodevelopmental disorder. A neurodevelopmental disorder is a genetic or acquired brain disorder or condition that is responsible for childhood-onset brain dysfunction.

Applied Behavior Analysis Therapy. Applied Behavior Analysis (ABA) is modeled after behavioral research by B.F. Skinner. ABA is the process of studying observable behavior and modifying behaviors through manipulation of the environment in which it occurs.

What Works Clearing House (WWC). The What Works Clearing House is a department of education database that reviews existing research on programs, practices, products, and policies in education.

Summary

Among the variety of unique characteristics that impact the way children with developmental disorders learn, behave, and socialize, their deficits in language skills cause many to also struggle with comprehension skills. As the number of cases increases, parents as well as educators, need more guidance in supporting struggling autistic readers in general education classrooms and at home. Through a self-study and analysis of empirical studies, methodologies and interventions for increasing reading achievement will be determined.

Chapter 2

Review of the Literature

A body of literature on special education services, Autism Spectrum Disorders, and reading achievement provides the basis for this study. This section will review the history of special education and related services, the history of Autism Spectrum Disorder identification and diagnosis, the impact of Autism Spectrum Disorders on reading achievement, and effective practices in reading comprehension instruction. This review will examine both theoretical and empirical studies in the field.

The following review was developed through a systematic search of several databases and organizations. Legal information was obtained from the Texas Education Code and Texas Administrative Code. Also included were journal articles published by The Council for Exceptional Children's (Exceptional Children and Teaching Exceptional Children), and those issued by the International Literacy Association (The Reading Teacher). More information was retrieved from articles in the Journal of Autism and Developmental Disorders, and the Education Research and Information Center (ERIC) using the filters: Autism or Autism Spectrum Disorders or Autistic Disorder and reading comprehension.

History of Special Education

Children with disabilities have not always received the support and services that are available to them now. For years children with developmental, psychiatric, or physical disabilities were not educated in the same classroom setting as their typically developing peers. Prior to the passage of the Education for All Handicapped Children

Act of 1975 (EAHCA), children with disabilities were excluded from public schools and sent to state schools, or schools for the deaf (Yell, Rogers, & Rogers, 1998).

As states began passing compulsory attendance legislation in the mid to late 1800s, court rulings such as *Watson v. City of Cambridge* (1893) and *Beattie v. Board of Education* (1919) prevented children who were “weak in mind” or those who were not able to “take ordinary, decent, physical care of themselves” could, by law, be removed from school. By 1934 the Cuyahoga County Court of Appeals (Ohio) had ruled that compulsory attendance laws could exclude children with certain disabilities, those who would not benefit from education or those who may be disruptive to other students in the classroom. Similarly, the Illinois Supreme Court ruled (1958) in the *Department of Public Welfare v. Haas*, that a free appropriate education was not required for feeble-minded or mentally deficient children (Yell, Rogers, & Rogers, 1998). To make matters worse, states such as North Carolina criminalized efforts by parents to insist that their children participate in public school education (Yell, Rogers, & Rogers, 1998). As time went on, some states began to allow students with disabilities to enroll in school but were unable to educate them adequately. Unfortunately, by the late 1960s, as many as 200,000 individuals with severe disabilities were housed in state institutions in very restrictive settings (Office of Special Education Programs, 2007). The Civil Rights Movement was a catalyst for many of the changes in the education opportunities for children with disabilities (Yell, Rogers, & Rogers, 1998).

Advocacy Groups

Parents of children with disabilities became fed up with unfair treatment in the education system. As more and more children were being excluded from school or

receiving a poor, inadequate education, parents began to work together to try to make changes for the needs of their children. One of the first parent organizations began in 1933 with the mothers of five children with mental retardation, The Cuyahoga County Ohio Council for the Retarded Child. Their protests led to the establishment of a special class for the children, sponsored by the parents. More and more of these groups began to organize throughout the next few years including The National Association for Retarded Citizens (NARC, now ARC) in 1950, The Council for Exceptional Children in 1922, The Association for Persons with Severe Handicaps (TASH) in 1974 as well as a variety of other organizations. Together, these advocates and parents worked for equal opportunities in education. Much of the success of the current special education programs is due to the diligence of advocacy groups (Yell, Rogers, & Rogers, 1998).

Special Education Legislation

The 1954 case, *Brown V. Board of Education of Topeka*, was a significant U.S. Supreme Court ruling that determined segregation of schools was unlawful, and that separate was not equal. The fourteenth amendment guaranteed its citizens equal protection under the law, and education was determined to be a right that should be available to all children equally; equal protection under the law is a relevant section of the law for disability rights advocates. The ruling not only benefitted black children in poor schools, but this legislation was also used by parents and advocates of children with disabilities to request and receive equal educational opportunities. The Brown case was only a stepping stone for advocates. It would be another 20 years before special education legislation was complete (*Brown v. Board of Education (1954)*) (Project IDEAL, 2013). The following cases and laws helped to shape the special education

policies, and procedures children with disabilities (and their families) are entitled to at present.

Pennsylvania Association for Retarded Children v. Commonwealth of Pennsylvania. The Pennsylvania Association for Retarded Children (PARC) relied on the Brown ruling in its case against the Commonwealth of Pennsylvania. The case, filed on behalf of 14 children with developmental disabilities, were denied access to public education. At the time, Pennsylvania law still allowed schools to exclude children below the mental age of 5. In this case, Pennsylvania law violated the rights of the children under the equal protection portion of the fourteenth amendment. The district court ruled in favor of the children in 1972. The state agreed to provide access to free public education to children with mental retardation until the age of 21 (Disability Justice, 2017) (Martin, Martin, & Terman, 1996).

Mills v. Board of Education. In the same year as the PARC ruling, the Mills v. Board of Education class action lawsuit filed on behalf of seven children with mental or behavioral disabilities were denied access to public education. The court ruled that children could not be denied a public education because of handicaps or deficiencies; the District of Columbia had a duty to provide a free public education to each resident in the district due to equal protection clause of the fourteenth amendment. The lack of funds was not a legitimate excuse (Disability Justice, 2017) (Martin, Martin, & Terman, 1996).

The Rehabilitation Act of 1973. Section 504 of The Rehabilitation Act of 1973 (PL 93-112) provides civil rights protection against discrimination for individuals with disabilities. It states that any entity receiving federal financial assistance must offer reasonable accommodation to persons with disabilities. In 1990 Congress expanded the

rights of individuals with disabilities in the American with Disabilities Act (ADA) (Martin, Martin, & Terman, 1996).

Education for All Handicapped Children Act. Public Law 94-142 or the Education for All Handicapped Children Act, was signed and approved on November 29, 1975. It was enacted to amend the Education of the Handicapped Act and required state and local education agencies to provide special education and related services, as defined in the law, to meet the needs of children with disabilities. The federal government would assist the states and local agencies with funding and programs to assure equal protection of the law. This free, appropriate education (FAPE) that all children were entitled to would emphasize special education and related services designed to meet the needs of each student at no cost to the parents. The Education for All Handicapped Children Act also required an individualized education program (IEP), or written statements of the child's present levels of performance, annual goals, and the specific educational services to be provided to the child. A statement regarding the extent to which the child would participate in regular education programs, a date for the initiation of services, and the evaluation criteria that would be used to measure progress toward those goals was also required (Public Law 94-142). An amendment to the Education for All Handicapped Children Act occurred in 1986 which added services for infants and toddlers (birth to age 2). Additional changes took place in 1990, and the act was renamed the Individuals with Disabilities Act.

Individuals with Disabilities Act (IDEA). The new Individuals with Disabilities Act was amended to include person first language and expanded the eligibility categories to include autism and traumatic brain injury (Yell, Rogers, & Rogers, 1998). Other

significant changes to the act occurred in 1997 and 2004, which added transition planning to the IEP process. Transition planning, planning for life after high school, must begin by age 14. IEPs must include goals for employment, postsecondary education options, independent living goals, and must identify community-based agencies or resources that would provide services to the adult student (Office of Special Education Programs, 2007) (The Legal Framework, n.d.). The 2004 amendment aligned the law with No Child Left Behind (NCLB) requirements (Office of Special Education Programs, 2007). The No Child Left Behind Act of 2001 had several provisions that affected students with disabilities. First, all teachers must be highly qualified, meaning they had to be certified by the state, have a bachelor's degree, and have passed a state test of content and knowledge. NCLB also increased accountability and called for annual testing of all students starting in grade 3. Last, it gave children in low-performing schools more options; children in schools that failed to meet state standards must be given the opportunity to attend a better school within the school district (United States Department of Education, 2002).

Special Education Legislation Timeline

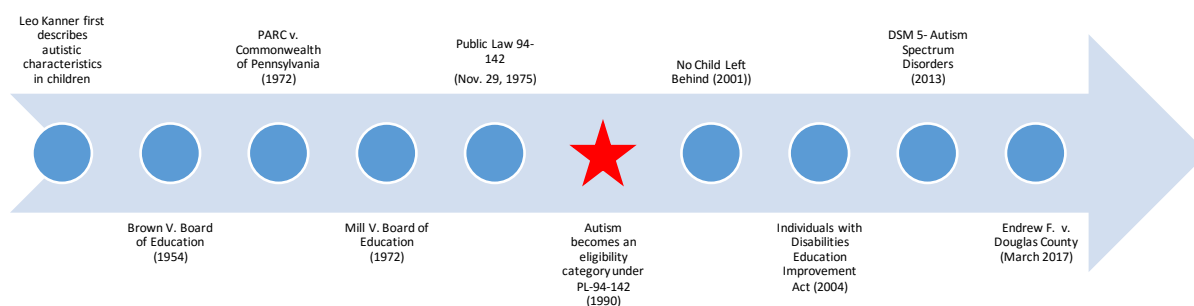


Figure 1. Timeline. Key events in special education legislation.

Summary

The history of special education includes events that helped to create the law and services children have today. Parent advocacy groups made complaints and saw their concerns all the way to court, which led to changes in legislation and services. The civil rights movement, another catalyst, aided parents and advocates in their battle for equal educational opportunities. While the laws, along with its amendments, have revolutionized the special education and related services available to students, the process is never perfect, and schools still seek guidance in providing a free appropriate education to students.

To better understand the significance of special education legislations for parents and educators, a description of Autism Spectrum Disorders and its impact on a child's education follows.

Autism Spectrum Disorders

Currently, the Center for Disease Control (2016) defines autism as a neurodevelopmental disorder that impairs a child's ability to communicate and interact with others. It is characterized by "restricted, repetitive behaviors, interests, and activities which cause impairments in social, occupational, and other areas of functioning," (Centers for Disease Control and Prevention, 2016). Further, a lack of social-emotional reciprocity, the ability to interact in response to others, is apparent. Many children with the disorder do not initiate social interaction or contact with others or share emotions. Typically, conversations are one sided and lack reciprocity (American Psychiatric Association, 2013).

Signs and Symptoms. Depending on the level of severity, some children show signs of Autism Spectrum Disorders in infancy while other children may develop normally for the first few years, and then suddenly lose language skills or display changes in behaviors (Mayo Clinic Staff, 2014). Autism Speaks, an organization devoted to supporting and advocating for children with Autism/Autism Spectrum Disorders and their families, provides developmental milestones for parents and caregivers, organized by age, that could be indicative of the disorder. The milestones serve as a guide to indicate delays in development in children which may need a follow-up. per Autism Speaks:

- By seven months, children should respond to other people's emotions, enjoy face-to-face play, and use their voice to express joy, displeasure, and to babble.
- By twelve months most children enjoy imitating others and sounds, enjoy social games, babble with changes in tone, and turn toward the speaker when their name is spoken.
- By twenty-four months most children imitate the behaviors of others and are excited to play with other children, they understand words spoken to them and can use two or more words to communicate to others. At this age, most children begin imaginative play.
- By thirty-six months, most children are openly affectionate and display a broad range of emotions. They continue imaginative play, follow two to three part commands and use simple phrases to communicate with others. At this point most children can correctly use the pronouns I, you, and me as well as some plurals.
- By age four most children cooperatively play with other children, have increased the amount of imaginative play, speak in sentences of five to six words and can tell stories, can name colors, understands the basics of counting and time, can follow three-part commands, and understand the concepts same and different.
- By kindergarten, most children are more social and more independent. They want to be like their friends. They like to sing, act, and dance and can distinguish fantasy from reality. Academically they can count ten or more objects, name four or more colors, speak in sentences of more than five words, and tell longer, more detailed stories.

(Autism Speaks, n.d.)

Children with developmental delays including Autism Spectrum Disorders typically do not hit any of the social or language milestones. Signs of a delay are typically apparent by age 2 or 3. A formal diagnosis can be made as early as 16 to 18 months of age; however, depending on the level of severity, some children may be school-aged before being identified. A few key signs for parents and caregivers are:

- Delays in developmental milestones or loss of milestones already achieved,
- Not using or understanding language as a same aged child typically would. No babbling or back and forth sharing of sounds (talking) by nine to twelve months,
- Child does not speak any words by sixteen months,
- A loss of speech or babbling skills that were previously present at any age,
- Difficulty interacting or relating to others,
- Little or brief eye contact with others,
- Does not display smiles or facial expressions by six to nine months of age,
- Does not point at objects to call attention to them. No reaching or waving by twelve months,
- Repetitive movements such as hand flapping, spinning, or tapping, or
- Playing with toys/objects in an odd or repetitive manner (Kid's Health, 2016) (Autism Speaks, n.d.).

Comorbidity. Approximately 44% of children with Autism Spectrum Disorders have average to above average intelligence. Nonetheless, Autism Spectrum Disorders are often associated with intellectual impairment and structural language disorder (an inability to comprehend and construct sentences with proper grammar) (American

Psychiatric Association, 2013) (Centers for Disease Control and Prevention, 2016).

Autism Spectrum Disorders frequently co-occur with other developmental, psychiatric, neurologic, chromosomal, and genetic disorders; it is more prevalent in children with disorders such as fragile X syndrome, deletions of chromosome 15q, and tuberous sclerosis (Centers for Disease Control and Prevention, 2016). Children who are nonverbal or have language deficits often struggle with specific learning difficulties in literacy and numeracy. They also have problems with coordination known as developmental coordination disorder and may suffer from anxiety or depression (American Psychiatric Association, 2013). Attentional issues, overly focused or easily distracted are common. Hyperactivity is common in children with Autism Spectrum Disorders (American Psychiatric Association, 2013). Any one of these comorbid disabilities can lead to a misdiagnosis when they are observed independently.

Another very common characteristic found in children with Autism Spectrum Disorders is avoidant/restrictive food intake disorder, characterized by a limited range of food preferences (American Psychiatric Association, 2013). Children may avoid certain foods due to their texture or color, or may only eat small portions of food.

Treatments. There are no cures for any of the disorders included in the Autism Spectrum Disorder category. Children may be prescribed medication to treat some of the difficulties they encounter, including medications to help with: irritability, aggression, repetitive behaviors, hyperactivity, attention problems, anxiety, and depression (National Institute of Mental Health, 2015). In conjunction, there are several research-based interventions used to support children with developmental delays, specifically the spectrum disorders. Both the National Standards Project (NSP) and the National

Professional Development Center on Autism Spectrum Disorders (NPDC) have conducted comprehensive reviews of literature that included experimental studies involving children and young adults with autism. The National Standards Project identified eleven established treatments and twenty-two emerging treatments. The National Professional Development Center, whose review covered ten years of publications, identified twenty-four focused interventions. The findings from both reports were similar. There were twenty-one evidence-based interventions both the National Standards Project and The National Professional Development Center on Autism Spectrum Disorders found most effective for children with autism:

- Antecedent-Based Intervention
- Differential Reinforcement
- Discrete Trial Training
- Extinction
- Modeling
- Prompting
- Reinforcement
- Response Interruption/Redirection
- Scripting
- Task Analysis
- Video Modeling
- Time Delay
- Cognitive Behavioral Intervention

- Naturalistic Intervention
- **Parent-Implemented Interventions**
- Peer-Mediated Instruction & Intervention
- Pivotal Response Training
- Self-Management
- Social Narratives
- Social Skills Training
- Visual Supports

(The National Professional Development Center on Autism Spectrum Disorders, 2017).

Most of these interventions are behavioral interventions and are frequently used with children on the spectrum, e.g. extinction, modeling, prompting, reinforcement, and task analysis. One common and rigorously researched method is Discrete Trial Training.

Discrete Trial Training. Discrete trial training (DTT), a form of applied behavior analysis, is a common treatment for children with ASD. In discrete trial training, a specific task or skill is repeatedly taught in isolation until it is mastered. The effectiveness of ABA methods is supported by research conducted by psychologist Ivar Lovaas in his 1987 publication, “Behavioral treatment and normal educational and intellectual functioning in young autistic children” (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014). Lovaas’ methods increased cognitive skills, language skills, adaptive skills, and compliance skills. His methods are recommended as an early intervention for children with developmental disabilities (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014) (The Lovaas Institute, 2017).

Developmental, Individual Difference. Another method, the Developmental, Individual Difference, Relationship-Based Model (DIR) is an emotional-developmental model described by Serena Wieder and Stanley Greenspan. It is known as the floor-time approach. This method offers playtime interactions for children and adults to foster a social-emotional bond between parents and caregivers. At the same time, caregivers can learn more about the child's individual needs: communication skills, attention span, motor skills, and their learning processes (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014). This approach allows parents/families/caregivers and educators to better assess and plan interventions and techniques for the child (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014).

Picture Exchange System. The Picture Exchange Communication System (PECS) is a visual support recommended for children who are nonverbal or have limited language skills. This method is a multi-tiered intervention used to build communication skills by using symbols and objects. The teacher teaches the student to make requests using symbols (either objects or images), and the child receives positive reinforcement when they use the correct symbols (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014).

Social Stories/Social Narratives. Social stories are used to help children learn to manage social interactions. Each story describes a social situation, social skill, social cue, or perspective and provides the reader with socially appropriate responses. The goal is to help children understand various social situations, and better prepare them for what to expect (Ryan, Hughes, Katsiannis, McDaniel, & Sprinkle, 2014).

Social Skills Training. Social skills training is a method used to teach children how to interact with others. Typically, the focus is on making eye contact, hand shaking, and maintaining socially appropriate personal space. Training programs include modeling appropriate behaviors and role playing (Kearney, 2015).

Over the years these methods have repeatedly been researched and have been found effective in many children with autism. The key components for each method include modeling, consistency, and using repetition to reinforce skills.

Background and History of Autism

The term autism was first used in 1911 by Eugen Bleuler to describe self-centered thinking and withdrawal from reality into fantasy as seen in schizophrenia (Scahill, Turin, & Evans, 2014). The characteristics of autism were described through a series of case studies by Leo Kanner, an Austrian-American psychiatrist in 1943. Kanner, a faculty member at Johns Hopkins University at the time, was known for his publication, “Autistic Disturbances of Affective Contact.” This series of case studies described eleven children (eight boys and three girls) with shared characteristics and behaviors similar to what we would currently identify as autistic.

Kanner’s Case Studies. The first, Donald, was first seen at the age of 5. While he was adept at memorizing faces, names, poems, pictures, and scriptures developed at an early age (2) his parents worried that he was not learning to ask or answer questions outside of single words responses. Donald was happy when he was left alone. He did not display any affection or interact with same age peers. As Donald grew older, he developed an interest in spinning blocks, pans, and other round objects. His evaluation noted stereotypic movements with his fingers, moving his head from side-to-side, and

repetitively humming and whispering the same tune; most of his actions were repetitions that were performed in the same manner each time.

Frederick also preferred playing alone and did not interact with others. He enjoyed toys with wheels as well as rolling balls back and forth. He was bothered by spinning tops, the vacuum, elevators, and the egg beater.

Richard was referred to Johns Hopkins at age three due to deafness. He did not talk or respond to questions, and his mother noted a regression in language skills in her letter submitted to the doctor. During his examination, researchers noticed that Richard, like the others, also enjoyed playing alone, and he was not deaf and was able to comply with spoken and gestural commands. Richard was placed in a foster home and at age four spoke his first words—good night.

Paul, referred at age five, was significantly intellectually impaired. He sang and repeated the same phrases, and he did not connect with others socially; he often acted as though they were not there. Paul had a good vocabulary and could properly construct sentences. He often misused pronouns, did not use first person point of view, and did not refer to himself as Paul. He also displayed some compulsive behaviors.

Barbara, age 8 when referred, also had difficulties with verbal expression, displayed repetitive behaviors, and misused pronouns. She held a preoccupation with the phrases “motor transports” and “piggy-back” which were often inappropriately used in conversation.

Virginia, ten at the time, lived at a state school for the feeble-minded from the time she was six but was later “paroled” to a school for the deaf. There it was determined that

she was neither feeble-minded nor deaf. She was described as “in a world of her own” and was not friendly or interested in others.

Herbert was thought to be “severely retarded in intellectual development” and was referred to Johns Hopkins at age three. An evaluation determined that he was of average intelligence. Like the others described, Herbert chose to play alone and without interference from others. His older sister Dorothy, by eighteen months, began dancing in circles, elected to be left alone, and made strange noises with her mouth. She had limited language skills and difficulties with pronouns. Initially thought to be feeble-minded (later determined to be of average intelligence), then schizophrenic, she later made a complete turnaround once her parents separated.

Alfred was age three when referred. He was slow to develop language and confused pronouns. Once he began talking he repeated the same words and phrases. Alfred was a worrier and preferred to play alone without interference. Similarly, Kanner’s provided a description of Alfred’s obsessive father, who did not get along well with others and “excitable” mother. He also described his severely obsessive maternal grandfather who had numerous tics, an obsession with hand-washing, one track thinking, and a fear of being alone to support the conclusion that there may be a genetic component to the disorder and/or learned behavior. Alfred scored 140 on the Binet.

Charles, age three, was described by his mother as inactive and unemotional. Early on he displayed an enjoyment for music and began to spin toys, bottles, and jars around the same time. He enjoyed playing alone with no interference from others and lacked appropriate language skills. Charles often repeated statements made to him in

conversation, never initiated conversations, misused pronouns, and did not make eye contact with others.

John, age four, as described by his father, developed slowly. Initially, he did not respond to commands. Over the years of his evaluation his language skills, while still underdeveloped, improved and he also began to make some affective contact. He misused pronouns although he was capable of forming sentences correctly. The bit of language he had was simply a repetition of what he had heard. Changes in routines were hard for John to the point that slight changes caused him to panic.

Elaine, evaluated at age seven due to “unusual development.” She had limited language skills and had only acquired four words by her first birthday and made no progress in the four years after that. By age five she began to speak in simple sentences described as “mechanical phrases,” that were not related to the discussion. She also had an excellent vocabulary and used plurals and correctly. However, she misused pronouns. Noises frightened her; she enjoyed playing alone and without disruption. She did not express emotion or change facial expressions, and she did not look anyone in the face.

Kanner’s case studies provided the first real description of children with autism: a preference for being alone, a preference for sameness, a fascination with objects, restricted interests, and language impairments (Scahill, Turin, & Evans, 2014). Common to all children in the study was the inability to relate to people and their situations/environment in a typical way. These characteristics led to an initial diagnosis of feeble-mindedness or schizophrenic, but Kanner attributed these idiosyncrasies to a rare and “unique syndrome,” that was not schizophrenia. The children were happiest when they were left alone and were oblivious to their surroundings which he described as

“extreme autistic aloneness.” The children completely shut out stimuli from their environment (Kanner, 1943). Kanner also noted though it is not a characteristic of Autism Spectrum Disorders in the current DSM, the tendency of the children in his case studies to overreact to loud noises. He assumed that the social interaction induced anxiety which caused the reaction (Scahill, Turin, & Evans, 2014) (Kanner, 1943).

Asperger’s Syndrome. Austrian-born Hans Asperger, pediatrician, later noted that some children with autistic characteristics had high verbal ability and levels of intelligence. They had specific talents that would allow them to thrive in adulthood. In his honor, the terms high-functioning autism (HFA) or Asperger’s Syndrome describes children with these characteristics (Orfano, 2010).

Identification and Diagnosis

The descriptions and characteristics of the children described in Kanner’s case studies would have likely led to a diagnosis of autism. Today, the diagnosis criteria are clearer to physicians and psychologists. However, we know that historically children autistic tendencies were not identified and served appropriately. Temple Grandin, professor of animal science at Colorado State University, discussed in her book, *The Autistic Brain*, the difficulty parents of children with autistic tendencies had with correct identification and diagnosis of the disorder and receiving appropriate treatments (Grandin & Panek, 2013). Dr. Grandin was born in 1947. A neurologist made her first medical diagnosis; he said she had brain damage, and he referred her mother to a speech therapist. During this time, the term and diagnosis of autism were still new to doctors. There was a question of whether the disorder was biological or psychological. Although Dr. Grandin had “autistic tendencies,” she does not recall being labeled “autistic” until she was around

twelve or thirteen. In her early 30s, while enrolled in a doctoral program at the University of Illinois at Urbana-Champaign that she took part in a psychoeducational assessment to further study her abilities (Grandin & Panek, 2013). For many children during this era, a diagnosis of autism was uncommon. With the publication and release of the diagnostic manual of mental disorders, diagnosis and identification measures began to change.

The DSM. The first publication of *The Diagnostic and Statistics Manual of Mental Disorders (DSM)* was in 1952. In both the first and second editions (published in 1968), autism-related behaviors fell under the diagnosis, “childhood schizophrenic reaction, childhood type” (American Psychiatric Disorder, 1968) (American Psychiatric Association, 1952). In 1980, the third edition (DSM-III), the term “autistic disorder” replaced “infantile autism” and was listed as a separate disorder with six symptoms:

- onset before 30 months of age,
- the pervasive lack of responsiveness to other people,
- gross deficits in language development,
- if speech is present, peculiar speech patterns such as immediate and delayed echolalia, metaphorical language, and pronominal reversal,
- bizarre responses to various aspects of the environment, e.g. resistance to change, peculiar interests or attachments to animate or inanimate objects,
- the absence of delusions, hallucinations, losing of associations, and incoherence as in schizophrenia (Scahill, Turin, & Evans, 2014).

Revised in 1987 (DSM-III-R), infantile autism was changed to autistic disorder, and the diagnostic criteria increased from six to sixteen. There were three categories (A, B, and C).

By 1994, *the DSM-IV* grouped autistic disorder with Asperger's Syndrome, Rett's Disease, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). These disabilities were all under the umbrella of Pervasive Developmental Disorders (Orfano, 2010).

In the current edition, *the DSM-V* identifies Autism Spectrum Disorder as a single disorder that includes individuals previously identified with autistic disorder, Asperger's Syndrome, childhood disintegrative disorder, or Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) (American Psychiatric Association, 2013). The diagnostic criteria for an Autism Spectrum Disorder as described in *the DSM-V* include five areas:

- A. Persistent deficits in social communication and social interaction across multiple contexts manifested by:
 - a. Deficits in social-emotional reciprocity
 - b. Deficits in nonverbal communication behaviors used for social interaction,
 - c. Deficits in developing, maintaining, and understanding relationships.
- B. Restricted, repetitive patterns of behavior, interests, or activities, as manifested by at least two of the following:
 - a. stereotyped or repetitive movements,
 - b. insistence on sameness,
 - c. inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behavior,
 - d. highly restricted, fixated interests that are abnormal in intensity or focus,

or

- e. hypo-or hyperactivity to sensory input or unusual interest in sensory aspects of the environment.
- C. Symptoms must be present in the early developmental period
- D. Symptoms cause clinically significant impairment in social, occupational, or other key areas of current functioning.
- E. Disturbances are not better explained by intellectual disability or global developmental delay. (American Psychiatric Association, 2013).

The diagnostic manual goes further to describe Autism Spectrum Disorders based on three levels of severity:

- Level 1 Requiring Support
- Level 2 Requiring Substantial Support (marked deficits)
- Level 3 Requiring Very Substantial Support (severe deficits)

A combination of the child's level of social communication and the severity of restricted, repetitive behaviors determines the required level of support (American Psychiatric Association, 2013).

Special Education Services

The diagnosis of Autism Spectrum Disorder is determined through evaluations conducted by a multi-disciplinary team: physicians, psychologists or psychiatrists, speech and language pathologists, or occupational therapists. Aside from DSM-V criteria, children can meet autism eligibility under the Individuals with Disabilities Education Act (IDEA) guidelines. IDEA defines autism as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance” (34 Code of

Federal Regulations 300.8 (c)(1)). Students that meet the Autism Spectrum Disorder criteria under IDEA vary significantly; intellect, communication skills, social skills, and behavior can range from above to below average (Randi, Newman, & Grigorenko, 2010). Many children with autism require supports at home and school. School districts are required by law to provide a free and appropriate education (FAPE) to all students with disabilities, individualized to meet each child's specific needs. Classroom accommodations or modifications along with specially designed instruction supports students in the learning process. Just as their same aged peers, they must participate in district and state assessments and are expected to make yearly progress. However, many students continue to struggle academically and fall behind their peers. A recent case, *Endrew v. Douglas County*, is an example. The debate on adequate progress and receiving "some educational benefit" versus making "meaningful benefit" was central to this lawsuit (*Endrew F. v. Douglas County School District*, 2015) (Wright, 2017).

The student named in the suit was a child diagnosed with Autism and Attention Deficit Hyperactivity Disorder who attended school in the Douglas County School District. He was later withdrawn from the district by his parents due to inadequate educational progress; they felt he was not making meaningful progress under his current IEP and his IEP did not address his escalating behaviors. He was enrolled in a private school that specialized in educating children with disabilities. The parents later sought reimbursement of tuition and related expenses stating that the school district failed to provide a free appropriate education. After a due process hearing, which is a legal process that is similar to going to court, the administrative law judge (ALJ) sided with the school district. The parents filed another suit with the United States District Court for the

District Court of Colorado, but the decision of the Administrative Law Judge was upheld. The United States Court of Appeals Tenth Circuit also affirmed the decision. Essentially, the lower courts that receiving some educational benefit satisfied the law's mandate to provide children with disabilities a free and appropriate education (Wright, 2017) (Endrew F. v. Douglas County School District, 2015). The Supreme Court did not agree. Chief Justice Roberts delivered the opinion. He found that Endrew's goals were fundamentally the same from year to year, which, in the eyes of the court, indicated that he was not making progress toward his goals. That lack of progress is the reason he was withdrawn from the district by his parents. At his new school, a newly created behavior intervention plan helped improve his behaviors, and he was able to make academic progress. Chief Justice went on to say:

When all is said and done, a student offered an educational program providing “merely more than *de minimis*” progress from year to year can hardly be said to have been offered an education at all. For children with disabilities, receiving instruction that aims so low would be tantamount to “sitting idly...awaiting the time when they were old enough to ‘drop out.’ The IDEA demands more.

(Endrew F. v. Douglas County School District, 2017).

This ruling is significant for all students with disabilities. This decision reinforces the importance of an appropriate education designed to meet the needs of children with disabilities. These students are entitled to special education and related services that provide meaningful academic benefit, not just the bare minimum. The concerns expressed in this case, and other misunderstandings concerning FAPE are not uncommon. As a result, guidance letters from the US Department of Education and the

Office of Special Education Programs (OSEP) regarding services to individuals with disabilities are not rare. In a July 6, 2015 guidance letter from the U.S. Department of Education regarding reports from the Office of Special Education Programs, districts are reminded to identify children with disabilities early and provide appropriate services, including children with Autism Spectrum Disorders. Reports from the OSEP state that many children with the disorder were not receiving speech and language services, and worse, the evaluation and eligibility process did not include speech and language pathologists. As a result, these specialists did not play a part in the development the child's individualized education plans or individualized family service plans, nor were they involved in the meetings. The guidance letter reminds state and local programs that they must ensure that decisions regarding services for children with disabilities take into account each child's specific needs (Office of Special Education and Rehabilitative Services, 2015).

Recent guidance letters have also expanded services for children with disabilities. August 5, 2016, letter clarified that online or virtual schools (including charter schools) must provide special education services to students who need them. Other letters reminded state, and local schools that children receiving special education services have the right to behavioral supports, not just academic supports. In another, clarification that IEP goals must correlate to grade level standards- standards-based IEPs.

Lawsuits, including the many others not discussed here, along with formal complaints, and guidance letters are an indicator that the process of providing appropriate special education services to children with disabilities is still unclear to educators,

parents, and advocates. While it is true that many children with spectrum disorders and other disabilities do well in school, there are many, as we have seen, who are not.

Autism Spectrum Disorders and Reading Achievement

Reading is the ability to decode words and obtain meaning, or comprehend, those words. The reader, the text, and other contextual factors (the purpose for reading, distractors, location, etc.) have an impact on effect reading comprehension (Carnahan, Williamson, & Christman, 2011). Reading comprehension is, “the act of understanding and interpreting the information within a text” (Shanahan, 2005, p. 28). It is the ability to construct meaning from what is read, and it requires active thinking and engagement by the reader. Reading for understanding, though, can be challenging for students with Autism Spectrum Disorders and is often a concern for parents and teachers. Outside of deficits in communication and social interaction, students also display cognitive processing deficits (Randi, Newman, & Grigorenko, 2010). Many children with Autism Spectrum Disorders have well-developed word recognition skills but have significant impairments in reading comprehension. Researchers have shown that as many as 65% of readers with Autism Spectrum Disorders have difficulties in comprehension despite adequate word reading skills (Carnahan, Williamson, & Christman, 2011) (Randi, Newman, & Grigorenko, 2010). This ability is referred to as hyperlexia. Children with hyperlexia have average to above average word recognition skills with below average comprehension skills. In a study conducted by Nation, Clarke, Wright, and Williams and published in 2006, forty-one children with Autism Spectrum Disorders between the ages of 6-15 were assessed in single word recognition, pseudoword recognition, text reading accuracy, and text comprehension. While most had good word reading ability, they

displayed poor reading comprehension skills. Results also indicated that their vocabulary and oral language comprehension scores were highly correlated with their comprehension score (Whalon, Otaiba, & Delano, 2009). Unfortunately, when word reading skills are average to advanced, below average comprehension skills are often not apparent to parents and educators. It is often assumed that both skills are developing at the same rate. In a longitudinal case study conducted by Holly Craig with the University Center for the Development of Language and Literacy at the University of Michigan, Jason, a child with Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), received intensive interventions to increase his language ability. He displayed delayed language and social development around age 3, unusual behaviors, and preferred to play alone. It was at that time that he was diagnosed with the spectrum disorder. His parents enrolled him in a preschool for children with disabilities, and they developed an at-home intervention based on applied behavior analysis for 15-20 hours per week. The Applied Behavioral Analysis (ABA) methods focused on eliciting speech and paying attention to the speaker. Additionally, he received 3-5 hours a week of speech therapy and one hour of music therapy. These therapies helped to improve how often Jason spoke when spoken to and the amount of attention he paid to the speaker. His speech, however, was stereotypic and flat. He continued to receive support at the University Center for the Development of Language and Literacy (UCLL) at the University of Michigan when he was 5. Further assessment led to the diagnosis of hyperlexia. Jason had advanced word recognition skills and what was described as “superior” decoding skills at the 95th percentile. His reading rate was high average at the 84th percentile; however, his comprehension score was low average at the 16th percentile. His treatment team

strategically used his hyperlexia to improve his pragmatics skills; his decoding and writing abilities were used as a temporary foundational support for developing language. The instruction was also structured around his strong visual skills and his preference for lines and shapes. As a result of the language supports, his ability to respond to WH-questions dramatically improved when he was able to answer questions during the reading of a text rather than when he was asked about the text through conversation. When working in small groups, he used cue cards to facilitate responses to questions. These written supports also enhanced his ability to respond to questions. Therefore, all new language concepts were presented visually as printed words or symbols, and orally with spoken models. Over time, as Jason improved, the visual prompts were faded. By age 12 Jason was still participating in the program and receiving therapeutic and educational support. Despite years of intervention, Jason continued to struggle with abstract thinking as well as metaphorical and multiple meaning words, common characteristics of children with developmental disorders. The importance of this case is the emphasis on taking a child's individual strengths, in this case, word recognition skills, decoding skills, and his visual learning ability to address his weaknesses. Another important aspect of this case study is the need to assess and address all possible areas for weaknesses. Early on Jason's teachers did not suspect deficits in comprehension skills because of his advanced word reading and decoding skills. It was assumed that his comprehension skills were developing at the same rate when in fact they were not (Craig, 2005). Jason's difficulties with language also point to another concern for children with autism spectrum disorders. In some cases, it is assumed that they do not comprehend information read when, in actuality, the problem is that they struggle to communicate

what they have learned (Kluth, 2010). It is important to allow children to use a variety of methods to convey their level on comprehension.

Oral language development plays a significant role in learning to read and write (Keene & Zimmermann, 2007). Educators and parents must also work to build language and communication skills.

Language skills are divided into two types: receptive language and expressive language. Receptive language is the ability to understand incoming information through listening, reading, and observing hand signs or body language. Expressive language is the ability to understand information through speaking, writing, and making hand signals or body language (Pohlman, 2008). Children develop syntax, sentence formation, comprehension, and vocabulary skills through frequent and consistent interactions with print and talking with peers, teachers, and family members (Pohlman, 2008) (Keene & Zimmermann, 2007). Likewise, an inadequate vocabulary, as previously stated, impedes comprehension skills. For example, multiple meaning words can be problematic as the ability to understand how a word is used requires advanced levels of language and communication skills that many children with disabilities lack (Carnahan, Williamson, & Christman, 2011). Correctly using pronouns and difficulties with words that look similar can also cause problems with readers.

Developing advanced skills such as text integration, metacognitive monitoring, inferencing, and a developed working memory has been shown positively impact reading comprehension ability (Randi, Newman, & Grigorenko, 2010). Two studies on children with Asperger's Syndrome determined that those who could decode grade level words could also comprehend material containing factual information, but could not make

inferences, especially at the abstract level (Randi, Newman, & Grigorenko, 2010) (Whalon, Otaiba, & Delano, 2009). Moreover, students with Autism Spectrum Disorders have been found to have concrete, literal thinking abilities, and have difficulty empathizing with others. They also find it difficult to organize information meaningfully, and they tend to focus on tiny details rather than the bigger picture. These cognitive differences and underdeveloped abstract reasoning skills negatively influence reading comprehension skills as well (Randi, Newman, & Grigorenko, 2010) (Finnegan & Mazin, 2016). An absence of Theory of Mind, impaired executive functioning, and a Weak Central Coherence have all been used to explain differences and struggles in children with Autism Spectrum Disorder. A Weak Central Coherence (WCC) is an inability to bring details together into one central idea. Students with a Weak Central Coherence have trouble moving from details to the big picture or not even recognizing the big picture. They have trouble determining the main idea and summarizing information, which can limit the ability to comprehend information (Finnegan & Mazin, 2016) (Carnahan, Williamson, & Christman, 2011) (Nguyen, Leytham, Whitby, & Gelfer, 2015).

Theory of Mind (ToM) is the ability to imagine what others are thinking or feeling. In reading, it affects the student's ability to understand a character's perspective and may hinder their ability to make predictions about a text or infer information from what was read (Finnegan & Mazin, 2016). This skill is difficult for children with ASD due to their deficits in social communication and social interaction. They struggle to be able to understand what motivates the characters in the stories, their feelings, and their behaviors (Finnegan & Mazin, 2016) (Carnahan, Williamson, & Christman, 2011). In one group of children with high-functioning autism, data determined that their difficulties

with the pragmatic aspects of language (the use of language in social contexts) impaired their ability to recall events in a narrative story in a meaningful and coherent way (Randi, Newman, & Grigorenko, 2010). Best practice suggests that children receive cues to aid their understanding of relationships and that they read narrative texts often to improve their social and pragmatic skills. Narrative texts often stem from real life experiences to which children are usually able to relate (Randi, Newman, & Grigorenko, 2010).

Executive functioning is described as a group of skills that include planning, organizing, and sequencing information, and the abilities to self-monitor and self-correct (Carnahan, Williamson, & Christman, 2011) (Finnegan & Mazin, 2016). Weak executive function impacts a child's ability shift their attention between the distinctive features in a text, their ability to set a purpose for reading, monitor their understanding, and make connections across texts (Finnegan & Mazin, 2016).

Several factors can impact a child's ability to comprehend texts. It is important to know what methods have been tried, researched, and supported to aid instructional planning and classroom instruction. In a study of six elementary schools in Montreal, Quebec, Canada, researchers examined the efficacy of instruction that explicitly and systematically targeted vocabulary and identifying the main idea. The school served both typically developing students and students with spectrum disorders. Forty-three students participated in the study. The intervention group received small group instruction in addition to class instruction. Both the control and intervention groups followed an approved socio-constructivist program designed to emphasize the independent reading of texts and word recognition rather than decoding. Explicit and systematic reading instruction was discouraged in the control group. The study compared the abilities of

students receiving explicit reading comprehension instruction with students that did not. Intervention sessions were three times per week for 30-minutes over a sixteen-week period. Forty-two of the sessions consisted of vocabulary and text reading sessions while the other six focused on the identification of anaphoric relations. Vocabulary sessions were broken up into four activities: the introduction of new vocabulary, story reading of a narrative text of approximately 350 words, main idea identification, then identification of the text structure. The intervention was found highly effective in improving the student's vocabulary knowledge and their ability to identify main ideas. Inconsistently, some students improved their ability to identify anaphoric relations and understand texts. Their conclusions: explicit instruction of reading comprehension is relevant for students with high functioning autism, and adaptations to the instructional approach are necessary (Roux, Dion, Barrette, Dupere, & Fuchs, 2015).

Supporting Reading Comprehension

As one of the most important academic skills we learn in school, reading comprehension is a critical skill for all students across all academic areas. Comprehension skills not only impact school performance but our ability to function in society as well. There has been much research over the years on improving reading comprehension skills by explicitly teaching phonemic awareness, phonics, oral reading, fluency, and vocabulary (Shanahan, 2005). Building these skills positively impacts a reader's ability to construct meaning from texts they encounter (Shanahan, 2005). The goal for all students is to become an active and proficient reader, a skilled reader. Studies of children regarded as "skilled readers" show that they take several proactive steps prior and during reading to aid in their understanding. First, they preview the text before

reading. They set goals and determine their purpose for reading, and make predictions and ask questions as they read. When needed, they revise their predictions and question the things that they have read. Skilled readers often make connections between what they already know and any new information they gain. They also create mental images to facilitate comprehension (Keene & Zimmermann, 2007) (Duke & Pearson, 2002). Additionally, proficient readers monitor their comprehension and adjust when necessary, can read a book from different points of view, can think aloud about their reading, can identify themes and ideas, and can use text management strategies such as rereading, skimming, scanning, and so forth (Keene & Zimmermann, 2007). Many students with Autism Spectrum Disorders have difficulties with these tasks.

Comprehension is an internal thinking process unique to each student (Morris, 2014). Currently, there is a large body of research that supports explicit comprehension strategy instruction to help students become metacognitive, or better able to reflect on their thinking as they read. This process helps promote understanding (Keene & Zimmermann, 2007). Strategy instruction helps ensure that children are not simply excellent decoders and word callers, but that they think critically and make judgments about the things they read (Keene & Zimmermann, 2007).

The National Reading Panel recommends seven comprehension strategies to support and improve readers: question asking, monitoring, summarization, question answering, story mapping, graphic organizers, and cooperative grouping. Also, noted as successful was building prior knowledge, encouraging mental imagery, and reading a variety of genres (Shanahan, 2005). Moreover, students should be encouraged to make connections and synthesize text, identify important ideas, and participate in discussions to

improve understanding (Keene & Zimmermann, 2007) (Nguyen, Leytham, Whitby, & Gelfer, 2015). As a matter of fact, best practice recommends that children have the opportunity to discuss literature in both small and large groups as frequently as possible. Not only does this aid comprehension, but it helps with oral language development (Keene & Zimmermann, 2007).

Children's reading experiences should encourage reading for pleasure, not primarily to teach strategies and methods that may take away from their enjoyment of reading. We want children to enjoy reading, so that are motivated to continue reading. Accordingly, with each reading lesson children should also be allowed to read independently for pleasure and enjoy listening as teachers read and think aloud texts during shared reading (Keene & Zimmermann, 2007). One method that encompasses several strategies is the Directed Reading and Thinking Activity.

Directed Reading and Thinking Activity. Directed Reading and Thinking Activity (DRTA) is a comprehension strategy that encourages readers to ask questions about a text, make predictions, then read to confirm or reject their predictions. The process encourages students to be active, thoughtful readers which will help improve their comprehension by activating prior knowledge, monitoring their understanding as they read, and help increase thinking skills (Directed Reading and Thinking Activity, n.d.). Directed Reading and Thinking Activity methods also help children concentrate on their reading, learn to make inferences, and interpret the story through their understanding (Morris, 2014). These methods can be used individually, in small groups, or with the whole class.

The Directed Reading and Thinking procedure require teachers to begin by activating the student's prior knowledge of the passage through previewing the text (title, headings, subheadings, pictures, and such). The teacher then guides students to make predictions about what they are going to read. The next step is to read up to a pre-selected stopping point; then the teacher asks questions about the sections they have read. Students are invited to consider/reconsider their predictions. At each stopping point in the text, students are directed to go back through the story, think about their predictions, and refine them as necessary. This process of reading to a stopping point, asking questioning, adjusting predictions, and then continuing is repeated until the story is complete. The steps included in the Directed Reading and Thinking Activity help students learn to make appropriate predictions, reflect on their reading, and to monitor their understanding which are strategies determined to be effective at improving reading comprehension.

Engaging readers. Another aspect of reading instruction is engagement. Engagement is one of the most important conditions for learning (Miller, 2009). Engaged reading is motivated and intentional. It is positively correlated with achievement. Engaged readers often read for enjoyment, interest, and to learn; they are dedicated to comprehension (Guthrie & Wigfield, 2000) (Baker, Dreher, & Guthrie, 2000). When students are actively engaged in reading, their level of comprehension improves consequently (Guthrie & Wigfield, 2000).

RECALL. One method for engaging children is through a shared reading routine. Reading to Engage Children with Autism in Language and Learning (RECALL) is a form of shared reading geared toward younger children with Autism Spectrum Disorders (Whalon, Martinez, Shannon, Butcher, & Hanline, 2015). It incorporates aspects of

shared reading such as modeling, corrective feedback, and praise, but also includes dialogic reading techniques. Dialogic reading (DR) is also a shared reading intervention that enhances oral language development in children. It includes prompts, Completion, Recall, Open-Ended questions, Wh-Questions, and Distancing or CROWD, and instructional procedures, prompt, evaluate, expand, and repeat or PEER. This combination of supports has been proven effective in young children with Autism Spectrum Disorders (Whalon, Martinez, Shannon, Butcher, & Hanline, 2015). A study conducted to determine RECALL's effectiveness with preschool children in a public elementary exceptional student education class included four children diagnosed with autism at an early age. The intervention used the RECALL method. However, the PEER procedures were modified to prompt, evaluate, expand, and praise (PEEP) rather than repeat. For three days a week, the interventionist shared age appropriate trade books of similar length with the students; all the books contained pictures. As part of the intervention, interventionist asked scripted questions before turning each page. Different questions were asked each day but used the same question prompts (CROWD). The first question, a completion, is a fill in the blank question with the blank at the end of the sentence, e.g. One fish, two fish, red fish, blue _____. The next is recall which consists of questions about the events in the story or the main idea, e.g. what is happening on this page? An open-ended question used in this technique may require the student to identify an object in the picture, e.g. what is this? Wh-questions are next, and the last is distancing. Distancing is where the interventionist asks the children to relate certain events or situations to their experiences.

When students give incorrect responses, the interventionist uses the PEEP method (prompt, evaluate, expand, and praise) to reach a correct response. At the end of the study, the frequency of incorrect or no responses to questions decreased, and the spontaneous correct responses increased gradually for three of the four participants. The visual supports were helpful for all participants initially, however, when those visual supports were removed, two of the participants continued to make gains while the other two decreased in the number of correct responses. This study determined that systematic instruction, paired with visual supports in a shared reading routine allow students with Autism Spectrum Disorders and variable language skills to participate meaningfully and benefit from instruction.

Summary

History indicates that children with disabilities, specifically those with developmental disabilities such as autism, have not been afforded the same education as their typically developing peers. Over the years special education legislation and research have changed the educational opportunities for children with disabilities. The law requires that districts provide a free and appropriate education for students receiving special education services. As such, educators must be able to determine which research supported methods and best practices are effective for children with various disabilities. Many studies have determined that comprehension strategy instruction improves reading comprehension skills in struggling readers. Additionally, rather than using a single strategy, it is recommended that readers learn to use multiple strategies simultaneously. When students are explicitly taught and practiced comprehension strategies, they begin to use the skills effortlessly and improve their comprehension of texts as a result. Shared

reading methods also support comprehension skills. Directed-Reading and Thinking Activity (DRTA) is a method that has been used to foster reading achievement.

Recommended strategies such as monitoring comprehension, predicting, and reflecting on reading, along with guidance from the teacher, helps students construct meaning from the texts they read. Reading to Engage Children with Autism in Language and Learning (RECALL) is another form of shared reading method which supports the needs of young children with the disability. For this study, a directed reading-thinking activity approach was selected.

Chapter 3

Methodology

This study is an autobiographical case study, which explored interventions, and strategies used at home to improve reading achievement in a fourth-grade student with Autism Spectrum Disorder.

Setting

This study analyzed strategies used at home to improve reading achievement in a child with autism. Therefore, all strategies and methods used occurred in the family home. The family “reading room” was used to limit distractions and offer access to books, magazines, and other visual aids and manipulatives. The office had two bookshelves and four crates of various genres of books for self-selected, independent reading. The area also held learning resources for supplementing reading, math, and writing skills as needed.

Participant

The subject of this study is a 4th-grade student diagnosed with autism in May 2016 and re-evaluated for speech services at the same time. He currently receives speech therapy services to a language disability, special education counseling by a licensed specialist in school psychology intern, and social skills training weekly as well as inclusion support twice daily.

Background. The subject was evaluated for speech services at age three due to limited language skills. As a toddler, he only used a few words to communicate and often responded as though he did not understand verbal directions without gestures. He

was found eligible for receives and received speech therapy services due to a language disorder.

By pre-k and kindergarten, the subject had increased his vocabulary, but was displaying behavioral concerns: stomping his feet in frustration, excessive crying and meltdowns, easily agitated by errors, and a throat-clearing tic. Nevertheless, he met all the academic benchmarks.

At home, the subject enjoyed spending time alone playing with his toy dinosaurs or mini people. He had lines (straight lines) of neatly arranged toys in his room. He was always careful to keep orderly and replaced them to their exact location daily. Because the subject elected to spend the majority of his free time inside and alone, his parents encouraged after-school extracurricular activities to encourage socialization. Over the years he was involved in various activities, including flag football and baseball to encourage socialization with kids his age.

In first grade, the subject continued to display throat-clearing tics that became more and more pronounced, and this concern was brought to the attention of the family physician. He recommended that the family continue to monitor the tics and inform the doctor if more occurred. The parents also expressed their continued concerns regarding language skills as well as his difficulties with self-help skills such as dressing himself and putting on and tying shoes. Regarding language development, the doctor jokingly stated, “When you have a girl first, you think your son is MR until he graduates high school!” The subject was enrolled in Cub Scouts to continue to encourage socialization skills and independence.

By second grade, the subject began to fall his classmates academically. While he was able to read words in isolation and spell on grade level fluently, his reading comprehension and fluency skills were weak. Further, there were difficulties in mathematics and handwriting skills, and his teachers pointed out that he was easily distracted at school. He did not seem to understand directions and often relied on his nearby peers for assistance.

Sensory over responsiveness as described by Temple Grandin and Richard Panek became evident. Sensory over responsiveness described individuals who are overly sensitive to input. Smells, sounds, and touch/the feel of objects bother them (Grandin & Panek, 2013). The subject's parents were aware that he was bothered by certain noises such as the sound of a vacuum or an airplane overhead. He was also bothered by the feel of tags in clothing which must be removed. However, a visit to the Rainforest Café with all of its animal sounds, and two visits to a local college basketball game that helped the parents realize that some significant sensory issues that interrupted his day to day activity; the subject frequently sat with his hands over his ears to dull the sounds he was hearing. Also apparent was his selective food preferences. There were only a limited number of foods the subject would eat. As time went on, foods that the subject previously enjoyed, he no longer wanted. Suddenly it was too slimy, smelled funny, or did not look appetizing. He still has a very selective list of foods that he will eat.

Outside of school the subject struggled with recreational activities (no improvement in baseball although he'd played since the age of three) and became less inclined to participate. His parents also noticed that the subject played alongside his peers rather than interact with them in play. He had difficulty initiating conversations with

others and often waited until he was approached or spoken to before he joined in with others. All parental concerns were again discussed with the family physician. The subject was referred to Texas Children's Hospital for an evaluation, however, after following up on the referral, the costs were more than the family could afford at the time. The family was later referred to a local outpatient therapeutic center where he was again evaluated for speech and physical therapy services; an occupational therapy evaluation was recommended but was not conducted. As suspected, he was found eligible for speech therapy services which he was already receiving through his school district, but not physical therapy. By the end of the school year, the subject was still lagging behind his classmates and appeared very immature for his age in comparison to his classmates. Grade retention was considered, but ultimately, he promoted to third grade.

By the end of September of his third-grade year, the subject's struggles in school were significant. His teachers stated that he did not self-start or complete assignments, would not raise his hand for assistance, and were concerned with his lack of social interaction although he did have friends that he played with daily. The subject continued to participate in parallel play. His reading teacher noted that he had good word recognition skills, but was unable to think abstractly about the things he read. Therefore, his reading achievement as assessed by district benchmarks was stagnant. At home, the student had no interest in reading or completing incomplete school assignments. Each night was a struggle to the point of frustration by all parties. Another visit to the family physician led to an Attention Deficit Hyperactivity Disorder (ADHD) evaluation. Input from both teachers and parents along with a 15 -minute computer assessment supported

the determination. The results indicated problems with attention. The subject began taking a 20mg dose of a stimulate medication daily.

By January the student still was not progressing adequately, and the parents requested a full and individual evaluation through the school district. A conference with the teachers also indicated no changes in the student since starting Vyvanse, so the parents stopped the medication. By April evaluation results were complete and are as follows:

WJ-IV Tests of Oral Language		
Oral Expression	92-Average	
• Picture Vocabulary	90 Average	
• Sentence Repetition 89-	95- Average	
Listening Comprehension	89- Low Average	
• Understanding Directions	92- Average	
• Oral Comprehension	88- Low Average	
Oral Language	89- Low Average	
Oral and Written Language Scales II		
Listening Comprehension	85- Low average	The majority of errors were in the syntactic area which measures the correct use of pronouns, possessives, plurals, verb tense, noun-verb agreement, and sentence structure items such as word order, and sentence complexity.
Oral Expression	72- Below Average	The majority of errors were within the syntactic area and the lexical/semantic areas which include vocabulary related to

		nouns, verbs, idioms, prefixes, and suffixes.
Oral Language	77- impaired	
CASL- Comprehensive Assessment of Spoken Language		
Pragmatic Judgment	76-impaired	The score indicates that the student has not experienced the use of socially appropriate language or has not been able to generalize the information needed to develop appropriate social language skills.
WJ-IV Tests of Cognitive Ability		
Fluid Reasoning	93	
Short-Term Working Memory	100- Average	
WJ-IV Cognitive and Achievement		
Long Term Retrieval	91- Average	
Meaningful Memory	69	
Associative Memory (visual-auditory learning)	97- Average	
Meaningful Memory (reading recall)	87- below average	
Auditory Processing	99-Average	
Visual Processing		
Visual Spatial	103	
Processing Speed		
• Processing Speed (letter-pattern matching)	94	
• Perceptual Speed (pair cancellation)	93	

Table 1. Formal Assessment Data. WJ-IV Scores for the subject.

Teacher comments included in the report:

Homeroom/Reading/Writing teacher

[The subject's] strengths are that he is cooperative and respectful. He enjoys working independently and reading to himself. He does not seem to be able to grasp higher level concepts or generate ideas on his own. At times, he becomes inconsolable when frustrated. He has trouble knowing when and how to ask for assistance. He seems unable to participate in higher level comprehension or application.

Science/Mathematics/Social Studies Teacher

[The subject] is getting better with copying notes from the board. I offer a hard copy, and he accepts them but doesn't use them. He tries hard to participate and do what he thinks I want him to do. He struggles with creating a plan to solve a 2-step word problem and explain how it works and why the answer is what it is. He also struggles with participating in table discussions. [The subject] has a hard time moving on to the next activity or class when he has not finished what he is currently working on. I teach three subjects, and this is a problem much of the time. [The subject] has great difficulty doing 3rd-grade mathematics. He has trouble processing what the word problem is asking and how to solve. If told how to solve a problem, he can use very basic skills, but nothing higher level. For example, if he is asked to solve a 2-step word problem, he will solve the first part but not take it further and answer the question given. He has difficulty answering higher level questions in discussions also. He often says he does not know. When

I break down the problem, he guesses, but cannot explain to me why he gave that guess...

He does not interact much with other students or adults. If I ask him a question, he may or may not answer. If he knows the answer, he gets excited about sharing it. If he does not know, he occasionally gets upset that he was called on (or that his name stick was pulled from the cup), but normally just sits there and looks at you with a blank stare. He has a friend in class he interacts with, but it is more of a copy each other than thinking up something original to do or say. In Social Studies, he recently worked with this student on a futuristic community, and they shared ideas. However, they are ideas from the Minecraft game, so they were not original ideas at all, but copied someone else.

Behavior problems include total shut down, refusal to work, pouting, anger (stomp his foot or crosses his arms against his chest and refuses to work), and loud wailing (when asked to show his work or get started working).

The subject did not pass the third-grade STARR reading or mathematics tests.

Home Supports

Various interventions were tried with the subject at home. Parents sought after school tutoring (private tutor as well as a learning center), an evaluation with a local brain training center which amounted to tens of thousands of dollars for six months of services, advice from other educators and professionals, extensive internet searches, blog recommendations, and books. Various iPad apps and web-based learning sites were used to support learning at home.

Interventions. At the end of the subject's first nine weeks reading the report (fourth grade) provided by the student's district indicated the following:

- Fluency and Accuracy: Student reads aloud one grade level or more below grade level appropriate text with fluency.
- Comprehension: Student does not comprehend grade-level appropriate texts
- Independent Reading: not assessed
- Summarizing/Retelling: Student is unable to summarize or paraphrase text. The student has several errors that affect the meaning and logical order of the text.

	4	3	2	1		
Fluency and Accuracy	Student reads aloud <i>above</i> grade level appropriate text with fluency (rate, accuracy, expression, appropriate pacing)	Student reads aloud <i>on</i> grade level appropriate text with fluency (rate, accuracy, expression, appropriate pacing)	Student reads aloud 2-3 <i>nine weeks below</i> grade level appropriate text with fluency (rate, accuracy, expression, appropriate pacing)	Student reads aloud <i>one grade level or more below</i> grade level appropriate text with fluency (rate, accuracy, expression, appropriate pacing)		
Comprehension	Student <i>consistently</i> monitors and adjusts comprehends <i>above</i> grade level texts. (using background knowledge, creating sensory images, rereading a portion aloud, generating questions).	Student <i>consistently</i> monitors and adjusts comprehends <i>on</i> grade level texts. (using background knowledge, creating sensory images, rereading a portion aloud, generating questions).	Student <i>inconsistently</i> comprehends grade level appropriate texts. Mainly knowledge level questions but has difficulty with higher level questions.	Student does not comprehend grade level appropriate texts.		
Independent Reading	Student <i>consistently</i> reads independently <i>above</i> grade level texts for a sustained period of time and can paraphrase what the reading was about, maintaining meaning and logical order.	Student reads independently <i>on</i> grade level texts. for a sustained period of time and can paraphrase what the reading was about, maintaining meaning and logical order.	Student <i>inconsistently</i> reads independently for a sustained period of time and has difficulty paraphrasing what the reading was about, or struggles to maintaining meaning and logical order.	Student is unable to read independently for a sustained period of time and lacks the ability to paraphrase what the reading was about, or maintain meaning and logical order.		
Summarizing/Retelling	Students can summarize or paraphrase above grade level text, maintaining meaning and logical order.	Student can summarize or paraphrase on grade level text maintaining meaning and logical order	Student inconsistently summarizes or paraphrases grade level text. The student has errors that affect the meaning and logical order of the text.	Student is unable summarize or paraphrase text. The student has several errors that affect the meaning and logical order of the text.		
100	92	85	78	70	65	60
16 points	13-15 points	12 points	9-11 points	8points	5-7 points	4 points

Figure 2. Nine Week's Reading Rubric

As a result, the parent/researcher decided to try new methods to intervene with reading at home. The subject did not elect to read voluntarily and was not able to choose books that he could read successfully on his own. He did not read from a variety of genres; his interests were limited to nonfiction texts about animals. Reading outside of school was limited to parent selected books that fell within his reading teacher's predetermined reading range. There was a shift from parent selected to student selected books with guidance on choosing a just right book.

According to Donalyn Miller, like many other experts in the field, in her book, *The Book Whisperer*, giving students the opportunity to choose their books to read encourages and empowers them by strengthening their self-confidence and promoting a positive attitude toward reading (Miller, 2009). With advice from *The Book Whisperer*, bi-weekly visits to the local library for reading material focused on self-selection of just right books. Without guidance, the subject selected dinosaur and animal books that were much too complicated (and lengthy) to read. Therefore he viewed the pictures only and returned the books weekly. A reading interest survey provided through *The Reading Strategies Book* by Jennifer Serravallo was given to the student to determine reading and other interests. Along with the reading survey, her strategies, "Keep Your Eyes and Mind in the Book" and "Retell and Jump Back In" were selected to be used in conjunction with other interventions.

Additionally, an informal reading inventory from *Assessing Reading: Multiple Measures* was used to evaluate abilities in: phonics, high-frequency word survey, *San Diego Quick Assessment of Reading Ability*, Oral Reading Fluency, Vocabulary screening, and Reading Maze Comprehension test.

Assessing Multiple Measures

Core Reading Maze	8 correct	4 th Grade 50 th %ile- 112
Comprehension	0 errors	
MASI-R Oral Reading Fluency Measures	54 correct 4 errors	
CORE Vocabulary Screening	14 correct 0 errors 16 no response	
San Diego Quick Assessment	Pre-Primer- 0 errors Primer- 0 errors Grade 1- 0 errors Grade 2- 0 errors Grade 3-1 error Grade 4- 0 errors Grade 5- 4 errors (frustrational level)	
CORE High-Frequency Word Survey	100%	
CORE Phonics Survey	Short Vowels 14/15 Consonant Blends with short vowels 15/15 Short Vowels, digraphs, and -tch trigraphs 15/15 R-Controlled vowels 15/15 Long Vowel Spellings 15/15	

	Variant Vowels 15/15
	Low Frequency Vowel and Consonant Spellings 14/15
	Multisyllabic words 19/24

Table 2. Informal Assessment Data. Scores from the Informal Reading Inventory.

Methods

Interventions used at home addressed fluency and comprehension skills such as paired/shared readings along with Directed Reading and Thinking Activities (DRTA). The student read self-select materials for independent reading with guidance on how to select a just right book. Timed fluency passages (nonfiction) were used Monday-Friday to assess and improve oral reading fluency.

Additionally, parents received training by a graduate student in psychology during the spring semester. The goals of the training were to develop language and communication skills. The parents and other family members were taught to engage and extend conversations and to model correct responses. These sessions were either video or audio recorded and reviewed by the trainer. The parent/researcher provided corrective feedback.

Summary

The parent/researcher worked individually with the subject at home for the first semester (and much of the second semester) of his fourth-grade school year. Shared readings along with weekly fluency passages (repeated readings) purchased through Teachers Pay Teachers. The third-grade level passages were selected based on his current reading level as reported by his reading teacher. Audiobooks were used to encourage reading and to allow the student to enjoy a book that he would not ordinarily read on his

own due to its length. Additionally, the subject guided to select a “just right” book from the library, and he selected his books for night time reading. Information from the subject’s teachers, psychologist, work samples, and the accelerated reading report was reviewed. Parents also received support through organizations, books, and other community resources and professionals.

Chapter 4

Conclusions

Children with developmental disorders require specialized instruction based on their individual needs. Case law and research have recognized that this is a necessity. Services and supports will look different for each student as they all have their unique set of strengths and weaknesses. In this study, the difficulty children with Autism Spectrum Disorders have with oral language, and reading comprehension was analyzed. Many children, not only children with Autism Spectrum Disorder, struggle with comprehension skills and require remedial instruction to improve their reading skills when they have significant deficits in language skills. Over the years, a variety of methods have been used for struggling readers, yet research has supported only a few. For children, parents, and educators of children with Autism Spectrum Disorder, there is a limited amount of research to support any one method.

The research questions in this study were:

1. What research-based teaching methods or strategies are effective for students with Autism Spectrum Disorder?
2. What at-home interventions increased reading achievement?

The first question, what research-based teaching methods or strategies are effective for students with Autism Spectrum Disorder, cannot be fully answered. Much of the specific methods used in each study included only a handful of students with autism. However, it was apparent from numerous studies that consistency, modeling, repetition, and explicit and systematic instruction were an important aspect of instruction. Comprehension strategy instruction was shown to benefit students in many studies.

Nevertheless, it is evident from the many studies and research that children with developmental disorders are unique and vary in ability and needs greatly. There is no one method or strategy that will work for all children, which was an error in my thinking. I was looking for one intervention to specifically improve my son's comprehension skills. The problem is that I was not looking at the whole picture and addressing all his needs. His deficits in comprehension skills come secondary to his high levels of anxiety and lack of self-confidence. Initially, I did not realize how significant his anxiety and shyness impacted his day to day functioning. Conferences with his coaches, cub scout leader, and teachers very clearly point to the need to improve his self-confidence and lower his levels of anxiety. In counseling, the psychologist intern works with him on coping skills as well as social skills, but the practice is in isolation. His teachers work with him to use those coping skills in the classroom when he is frustrated.

The second question, what at-home supports helped to increase reading achievement has several answers. In the Directed Reading and Thinking Activity used with the student, children learn to be active readers by activating their prior knowledge, learning to make predictions, and think critically about their reading while receiving support and guidance. Discussion of the books read, relating family experiences to events in the texts, as well as listening to and discussing audiobooks listened to appear to have helped the student build his vocabulary and has helped him to initiate conversations (as well as continue conversations) without prompting. The practice of shared reading, making predictions, and answering questions in the Directed Reading and Thinking model at home has helped the subject to spontaneously make predictions about the stories read outside of the sessions.

During the duration of this study, subject listened to and responded to the following books: Brian's Saga (Hatchet, The River, and Brian's Winter) and Pax. These stories were of high interest to the subject. As he listened to the stories, he could make predictions about what would happen next, in most cases without prompting. He could answer questions such as, what would you do if you were Brian and how do you think Brian feels there by himself, but his answers did not represent an actual understanding of the situation, e.g., I would call someone to come pick me up.

The fluency practice passages appear to have made a positive impact on the student's oral language fluency. The parent/researcher noted that once the subject realized he was timed for fluency, there were less (at sometimes zero) incidences where he stopped to clear his throat. The throat clearing tics appear to be a sign of anxiety.

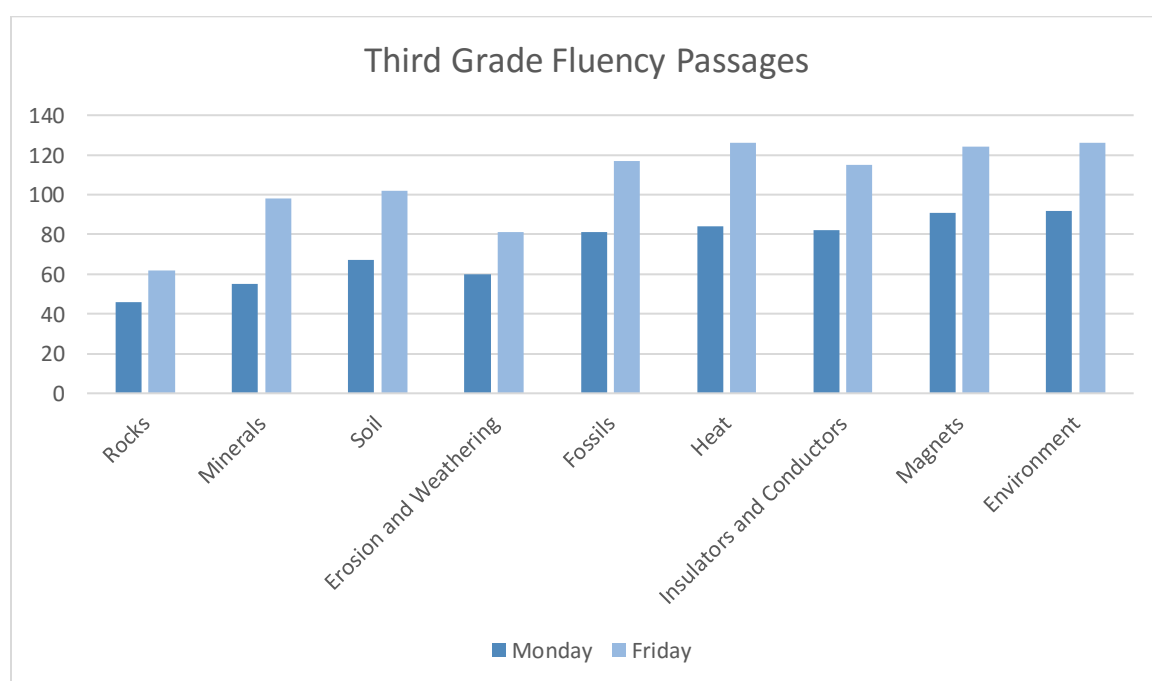


Figure 3. Fluency Passages

Fluency passages were read three times per day for five days. Monday and Friday number of words read correctly were graphed. The first passage, Rocks had a lower than expected score. The student was irritable and did not want to read at all. His reading was slow, and he stopped frequently asking, “Why do I have to read this?” The fourth week’s passage, Erosion, and Weathering contained vocabulary unfamiliar to the student. His reading rate was lower than expected. An important note, when reading independently the student read more fluently with fewer incidents of throat clearing as well.

Reflection

As parents, we always want what is best for our children. We push them to do their best at everything they do. For the oldest child, a girl, this was not a challenging task. She has always been a good and studious student. She completes assignments as required without being told or reminded. She effortlessly makes As in her classes, makes friends easily, and has an outgoing personality. Our son is the exact opposite, and we were not prepared for it.

Initial ARD meeting. My son’s initial Admission, Review, and Dismissal (ARD) meeting was stress inducing for both parents. In addition to both parents, the school principal, his math teacher, a special education teacher, a psychologist, an autism specialist, and the speech therapist were in attendance. As his full and individual evaluation (FIE) was reviewed, I remember feeling thankful that he was of average IQ. However, I also remember feeling agitated, well angry with the entire process. His evaluation and ultimately eligibility to receive special education services were the direct results of a parent request. With the deficits and concerns stated by his teachers over the

years, to my knowledge, he did not receive response to intervention (RTI) monitoring or any tiered interventions. I know with certainty that he was not recommended for an evaluation by school personnel. That was disappointing. As a matter of fact, one teacher stated during a parent-teacher conference that she had previously worked with children with disabilities and that the subject did not seem to fit the special education criteria. I cannot help but wonder how long he would have struggled before one of his teachers decided there was a problem. What would have happened if he had not had a parent familiar with learning disabilities and the special education process?

Another frustration that came during his initial ARD meeting was the creation of his annual goals and schedule of services. My biggest fear prior to the request for an evaluation, after identification, and going forward was that a special education label would lead to a substandard education and low academic expectations. His annual goals for the remainder of that school year and into his fourth-grade school year were to:

- (1) initiate age-appropriate conversations,
- (2) self-initiate help by raising his hand and asking for assistance,
- (3) sequence and summarize the plot's main events and explain their influence on future events,
- (4) write responses to literary or expository texts that demonstrate an understanding of the text,
- (5) given charts and formulas, use a problem-solving model to determine and justify the solution to a problem,
- (6) using verbal and visual prompts increase language skills in a structured setting,

(7) correctly identify the social cues of others as well as appropriate responses to the cues, and

(8) accurately identify feelings and appropriate coping strategies in anxiety-provoking scenarios.

These goals accurately reflect my son's needs, however, the problem, in my eyes, was the low level of mastery. Some mastery levels were set at 1 of 3 (33%), 3 of 5 (60%), and up to 4 of 5 (80%) on the counseling goals. The accommodations and services that would be provided to meet those goals seemed appropriate as well.

ALTER ASSIGNMENTS BY PROVIDING:	GOAL & OBJECTIVE/SUBJECT								All Areas
	LAE	M	SSH	SCI	PEA	FA	CT	R	
Reduced assignments <u>Reduce assignments by 25%</u>									X
Legend: LAE=LanguageArts/English M=Math SSH=Social Studies/History SCI=Science PEA=PE/Athl FA=Fine Arts CT=Career/Technology R=Reading OTH=All Areas									

ADAPT INSTRUCTION BY PROVIDING:	GOAL & OBJECTIVE/SUBJECT								All Areas
	LAE	M	SSH	SCI	PEA	FA	CT	R	
Short instructions (1or 2 steps)									X
Extra time for oral response									X
Extra time for written response									X
Peer tutoring/paired working arrangement									X
Directions given in a variety of ways/simplified vocabulary									X
Close proximity to teacher & instructional focus									X
Math charts		X							
Legend: LAE=LanguageArts/English M=Math SSH=Social Studies/History SCI=Science PEA=PE/Athl FA=Fine Arts CT=Career/Technology R=Reading OTH=All Areas									

MANAGE BEHAVIOR BY PROVIDING:	GOAL & OBJECTIVE/SUBJECT								All Areas
	LAE	M	SSH	SCI	PEA	FA	CT	R	
Positive reinforcement									X
Frequent eye contact/proximity control									X
Legend: LAE=LanguageArts/English M=Math SSH=Social Studies/History SCI=Science PEA=PE/Athl FA=Fine Arts CT=Career/Technology R=Reading OTH=All Areas									

Figure 4. Third Grade Class Accommodations

In addition to classroom accommodations, he would receive counseling services, continue to receive speech therapy services, and inclusion support. Social skills training, typical for children with autism, would be provided twice per week.

Related/Other Services	Duration/Frequency	Location of Services	PEIMS	Start Date	End Date
Counseling Services	20 Minutes, 1 time per week	Special Education Resource Room - Individual	X	05/04/2016	05/03/2017

IEP Services /Supports necessary to implement IEP	Duration/Frequency	Location of Services	Start Date	End Date
Speech and Language Therapy	30 Minutes, 1 time per week	appropriate speech therapy setting - Group	05/04/2016	05/03/2017
Inclusion Support - Math	30 Minutes, daily	General Education Classroom - Group	05/04/2016	05/03/2017
Inclusion Support - Reading	30 Minutes, daily	General Education Classroom - Group	05/04/2016	05/03/2017
Social Skills	15 Minutes, 2 times per week	General Education Classroom - Individual	05/04/2016	05/03/2017

Figure 5. Third Grade Schedule of Services

My son ended his third-grade school year receiving these services. While he was promoted to fourth grade, his grades and performance hovered just above passing.

Course	Teacher	9Wk-1	9Wk-2	9Wk-3	9Wk-4
3RD WRITING		82	75	71	74
3RD READING		71	71	70	70
3RD MUSIC- [REDACTED]		S	S	S	E
3RD PE [REDACTED]		S	E	E	E
3RD ART [REDACTED]		S	E	E	E
3RD MATHEMATICS		62	70	86	74
3RD SCIENCE		70	75	85	91
3RD SOCIAL STUDIES		71	78	94	70

Daily Attendance	
Description	# Days Absent
Absences	1

Grade Scale Legend	
A	90 - 100
B	80 - 89
C	75 - 79
D	70 - 74
F	0 - 69
E	Exceeds Expectations
S	Satisfactory
N	Needs Improvement
U	Unsatisfactory

Further, He did not pass the third-grade math or reading STARR tests.

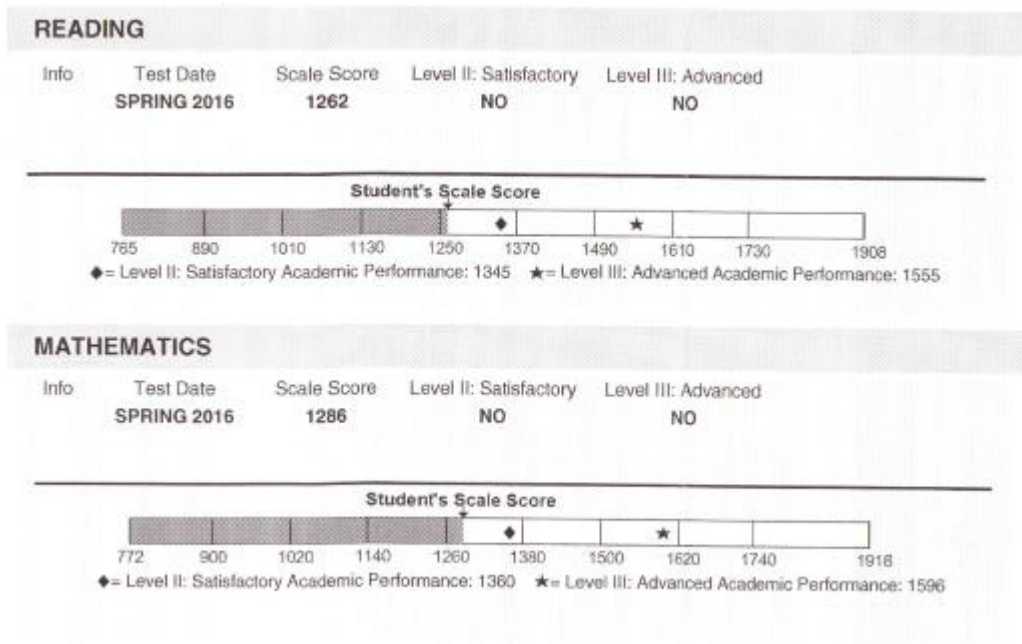


Figure 6. Spring 2016 STARR Results

There were three reporting categories in reading: (1) understanding across genres, (2) understanding/analysis of literary texts, and (3) understanding/analysis of informational texts. In this first category, he correctly answered 3 of 6 questions. In the second, he only answered 6 of 18 questions correctly which is around 33%. The last category he answered 5 of 16 questions correctly which is around 31%. For a total reading score, he answered 14 of 40 questions correctly which is around 35%. His math scores were similar with a total score around 36%.

Because of his performance in third grade, several reading and math apps were used to reinforce math and reading skills. He was also given access to a summer reading

eBook program as well as a subscription to an interactive book app online. His parents continued to share books at home, and he was also encouraged to participate in summer camps and activities with the Cub Scouts to encourage and support his developing socialization skills.

During the summer, I visited a local private religious school as a possible placement for the upcoming school year. This school is known to have a much smaller teacher to pupil ratio. However, they tend to assign generous amounts of homework daily. My visit with the third-grade Dean was informative. As a private school, they do not provide the special education services required under the IDEA. They use placement tests to assign students to grade levels; he would not automatically be enrolled in a fourth-grade class even though it was his last placement. Also, as a fourth grader, he would be introduced to Latin. The curriculum fees and tuition were substantial new expenses. After much thought, we decided it would be best that he return to his elementary school where he had already made friends, and the staff is familiar with his needs.

Fourth grade. The subject was fortunate enough to have a fourth-grade teacher with several years of experience and was rarely absent. With his supports in place, he continued to struggle with grade level material, but he seemed to be performing much better than in the previous year. At home, it is hard to get the student to read independently for the required 20 minutes per night. Completing math homework was challenging. Both my son and I would get frustrated with the entire process. He was frustrated because he could not understand the material. I was frustrated because I could not figure out why he was having such a tough time. There were many nights of tears,

yelling, and unfinished homework. Conferences with teachers indicated the same issues as the previous year. He does not ask for help, does not immediately start tasks without prompting, does not complete tasks, and still gets frustrated to the point of tears in class. By working with his counselor, these issues got better over the length of the school year but did not completely end.

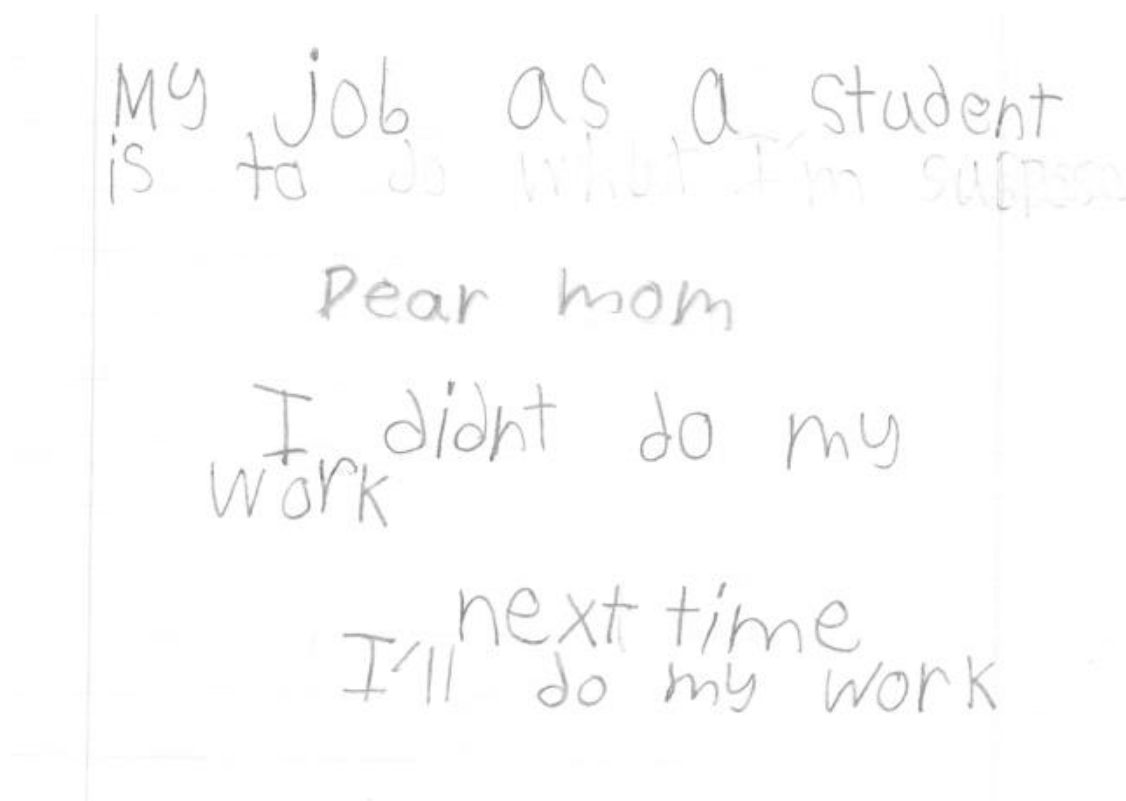


Figure 7. Letter home

Second Annual ARD. The second annual ARD meeting was much less stressful than the first. In addition to both parents, the assistant principal, speech therapy supervisor (the intern who works with him is not allowed to attend ARD meetings), a psychologist trainee, the psychologist intern who provides counseling services, the inclusion teacher, and his classroom teacher. As is common, the meeting began with a

review of his present levels of academic performance. He scored 35% (7/20) on the district reading benchmark. It also struggled to compare and contrast the actions of characters, summarizing information in text, sequencing and summarizing the plot's main events and supporting details, making inferences and drawing conclusions. He had a few strengths:

1. Able to use the context to determine the meanings of unfamiliar words,
2. Able to describe the interactions of characters and their relationships and the changed they go through,
3. Able to use multiple text features to gain and overview of the content of texts and locate information, and
4. Able to summarize the lesson or message of a work of fiction as its theme.

As the special education teacher moved on to math and writing performance, I became aware of two new issues that I had not previously considered. Three of the professionals that work with him daily consistently mentioned his high levels of anxiety. I was aware that certain situations made him anxious, but I was not, until that point, aware of how much of an impact it was making on his performance at school. Likewise, his classroom teacher made the statement, "He just doesn't like tests, they make him nervous." She also mentioned that many times he would simply guess at multiple choice items rather take the time to determine the correct answer.

As the meeting continued, and the committee set goals and services for the remainder of the school year into his fifth-grade year, which will be at another campus, I pondered the impact of his anxiety and what could be done to help him. Presently, he has two teachers whose classrooms are in the same hallway of a school he has attended five

years. Next year though, he will have seven teachers spread out over one floor of the intermediate school. The concerns for next year are real. As parents, we now realize that the concerns are not and cannot be just academic, we must also consider his social and emotional well-being. Our fears, in addition to the academic struggle, are of bullying due to his quirky behaviors and that he will be isolated from his peers. I am afraid that he will be that child sitting in the cafeteria eating lunch alone. I also know that he is easily led and easily angered, which could lead to behavior problems. This summer will be spent reviewing and expanding on the coping skills he has been taught in counseling this year.

In addition to making sure he participates in summer camp, he will attend tutoring sessions through Sylvan Learning Center three days a week for 2 two hours a session. In the initial interview and assessment, I was reassured that the teachers and staff had been trained to work with students with disabilities, including autism. Their brochures state that kids at Sylvan typically see up to two times more growth in their math scores than other students. Technology is used to enhance the way the children learn. Discussions with other parents in the waiting room gave the impression that this may be a step in the right direction. While the tutoring sessions are not one-to-one, the three-to-one setup still provides plenty of support for the students. We are looking forward to a positive outcome.

Summary

The combination of Directed Reading and Thinking Activity, high-interest audiobooks, and repeated readings of fluency passages seem to have helped the student's reading achievement. However, because the student received a variety of supports both

during and after the school day, it is possible that combination of all interventions was the major influence.

According to his teachers during his March 2017 parent teacher conference, he has made progress in reading; his reading teacher stated that he was reading on grade level (4.2), but continues to struggle with higher level reading skills, namely inferencing. Summarization skills have improved as well as his ability to identify the main idea. A review of his IEP progress report indicates that he has not made sufficient progress on the first or second goals. He has mastered the third goal, and it was discontinued. His progress report also indicated that he has some progress on the remaining goals (from 40-60% mastery).

Also, teachers stated that they focus on building his self-confidence and help him identify anxiety provoking situations and use the coping skills learned during counseling. Anxiety concerns came to the forefront as a concern to address.

The Future. This research experience was enlightening. Going forward, I realize that we must step back and look at the bigger picture. We were focused on the details and not paying attention to the big idea. We must support our son at home not only academically, but socially and emotional as well. We must help him deal with his anxieties and work more at helping him become confident with himself.

Chapter 5

Discussion

The importance of reading at home and family literacy documented in the research. There is, however, a lack of research concerning ways parents of children with Autism Spectrum Disorders can remediate reading skills at home (Ariculi, et al., 2013). Home-based strategies such as shared book reading and oral reading practice are common; however, excessive error correction may negatively affect struggling readers. Print-based shared readings where parents focus on sound-letter correspondences (phonics approach) is most common and is also the method shown to advance children's literacy more effectively (Ariculi, et al., 2013). From a parent/research perspective, it appears that interactive and shared reading which model comprehension strategies such as questioning, making predictions, and monitoring comprehension are most effective for children with Autism Spectrum Disorders. It is likely that these methods would benefit any struggling reader. While some children may require more or fewer supports, it is important to note the individual needs of the children so that they can be accommodated. Visual supports, cueing cards/cueing systems, behavior supports, and scaffolded language supports may be necessary, but they all appear to support and improve the reading skills of struggling children. As we research information regarding literacy supports for children with Autism Spectrum Disorder, there are many other therapies and needs for this population of children. Parents tend to turn to community-based resources.

Federal and State Requirements for Children with Autism

Federal and state requirements for children with autism guide the need for resources and services provided in the community. The Texas Administrative Code

(TAC) requires that the ARD committee for children found eligible for special education services as a student with autism consider the following peer-reviewed, research-based educational practices:

- Extended educational programming which could be an extended school day or extended school year services (ESY) based on an assessment of their behaviors, social skills, communication, academics, and self-helps skills,
- Daily schedules that allow for little unstructured time, actively engaging learning activities,
- In-home and community-based training as appropriate and if needed.
- Positive behavior support strategies which may include a behavior intervention plan,
- Futures planning for living, work, community, and educational environments,
- Parent training and support provided qualified personnel with experience in autism spectrum disorders,
- A suitable staff to student ratio appropriate for social and behavioral progress based on the student's developmental and learning level,
- Communication interventions as needed,
- Social skills support
- Professional training and support for staff who work with the student, and provide
- Teaching strategies based on research-based practice for children with autism spectrum disorder (Texas Administrative Code).

These practices are addressed in the Autism Supplement that is completed annually at the student's annual review meeting.

State and Local Resources

Along with the IEP requirements, as the diagnosis of Autism Spectrum Disorder continues to increase, more and more websites, blogs, books, and journals are publishing information to help support students and families impacted by a child with autism. At the conclusion of my son's initial admission, review, and dismissal (ARD) meeting, I was given two booklets. The first was an Autism Spectrum Disorder Resource guide created by the local school district. The other, a "First 100 Days Kit" created by Autism Speaks. The district resource guide contained contact information for several state and local resources:

Texas Department of Disability Assistance and Rehabilitative Services (DARS).

The Texas Department of Disability Assistance and Rehabilitative services started an autism program in 2008 for children ages 3-8. The program was initiated to help parents find services for their children with autism. The services included applied behavior analysis (ABA) and positive behavior support strategies. The services are provided through grant based contracts with local and community organizations. The program was later extended to children and families ages 3-15 (Texas Department of Health and Human Services, n.d.). All programs provided under DARS as of September 2016, are now provided through the Texas Workforce Commission (TWC) and the Texas Department of Health and Human Services

Texas Department of Family and Protective Services. The Texas Department of Family and Protective Services provides information regarding Autism Spectrum

Disorder through the Texas Adoption Resource Exchange (TARE). It also offers information for parents such as nearby child care facilities including those for children with special needs as well as resource links to other programs and centers for children with disabilities (Texas Department of Family and Protective Services, n.d.).

Education Service Center. Education Service Centers (ESCs) serve as a link between local districts and the Texas Education Agency. Their purpose is to help school districts work to improve student performance, help districts operate efficiently, and to help implement any initiatives by the legislature (Texas Education Code). Each service center has a special education department which provides training and support services to educators and families of children with autism.

Partner Resources Network, Inc. (PRN). The Partner's Resource Network is a nonprofit Texas agency affiliated with the parent training and information center. The goal of the PRN is to help parents and families understand their child's disability, assist them to understand their rights under IDEA, obtain information regarding services, and to participate with other professionals in planning services for their child (Partner's Resource Network, Inc.)

Social Security Office. Parents can apply for social security benefits for their child. Supplemental Security Disability Income is provided for people with disabilities and is based on financial need (Social Security Administration, 2017).

Tri-County Services. Tri-County Behavioral Healthcare provides mental health services to children and adults including counseling and rehabilitative services (training). Their mission is to deliver services for people with mental illness, substance abuse

disorders, and intellectual/developmental disabilities (Tri-County Behavioral Healthcare, n.d.).

Other resources in the packet included a list of local areas counselors, contact information for community-based, outreach programs that teach those with disabilities to live, work, and learn in their communities. Family organizations such as the Texas Autism Research and Resource Center, the Texas Council on Autism and Pervasive Developmental Disabilities, Texas Parent to Parent, Texas Project First, and The Arc were described. Many of the programs offer online training videos for families as well as annual conferences for families, educators, and other professionals. One such website is the Texas Statewide Leadership for Autism Training. This site provides online training for parents and educators of children with autism. Online training video include:

- Basic courses,
- Strategies for working with students with autism in the general education setting,
- School-based applied behavior analysis programs for students with Autism Spectrum Disorders,
- Evidenced based practices,
- Child-centered collaboration,
- Additional learning opportunities, and
- Courses in Spanish (Texas Statewide Leadership for Autism Training, n.d.).

Similarly, Autism Internet Modules (AIM) also provides online training for parents, educators, and caregivers. The courses are in webinar format; however, the modules also include video case studies. The videos included provide

examples and non-examples of the signs and characteristics of children later identified as a child with an autism spectrum disorder and those who are typically developing. Both training systems provide a wealth of information for those new and those who are familiar with autism.

The First 100 Days is a toolkit compiled to provide families with information for the first hundred days after diagnosis. The toolkit educates families on autism (diagnosis, a definition symptoms, abilities, and other possible physical/medical issues), tips for dealing with autism from the perspective of experienced parents, how to get services for your child, treatments, and finding support personnel. For families, new to the diagnosis of autism, this toolkit provides a wealth of information to support families.

Autism Speaks. Autism Speaks is a national organization that supports individuals and families with autism. Their mission is to increase the understanding and acceptance of Autism Spectrum Disorder while working to advance research in autism. Following this organization keeps parents up to date on new legislation, therapies, research, and treatments for children with autism. It is not the only organization of this kind; however, it is very well known.

Reflection

As the parent of a child diagnosed with autism, I admit that I have struggled with identifying and providing the appropriate support services. My career in education, specifically special education has trained me to work with children and adolescents with special needs. However, the process of evaluation, identification, and diagnosis left me feeling unequipped to handle the needs of my son. Sitting in the parent seat at an ARD

meeting rather than participating as the educational diagnostician, as I have done for the last eight years, left me with an uncomfortable feeling. There is guilt for not having him evaluated early on at the age of three, but there is also the feeling that he is just a quirky kid and grow out of his peculiar habits—I have said that quite a few times. His older sibling effortlessly did well in school, so I was not prepared to work with a child of my own who struggled with mathematics and literacy skills. As a professional, I felt embarrassed. I looked for any information I could and asked anyone that I thought could provide solid advice. Deep down I felt that I should have been able to provide the support he needed with my experience as an educator. Admittedly, I still do not have it figured out, and I still feel guilty. I do, however, I feel as though the support groups and blogs I follow have helped significantly and that we (my husband and I) are making steps in the right direction for our family.

Summary

An autism diagnosis is not the end of the world. There are many successful adults with autism doing amazing things. In a February 2017 article titled, “Autistic Academics Give Their Thoughts on University Life” by Margaret Prior. This article focuses on academics living with autism, Asperger’s, or another Autism Spectrum Disorder. The focus is on their experiences in research, teaching, and working in higher ed.

Participants discussed how they felt autism impacted their ability to perform their job. Many felt they benefitted in some aspects of academia due to their autistic characteristics. Specifically, many felt their attention to detail, and greater focus made them good researchers; it enhanced their ability to see patterns. The obvious drawbacks are the social aspects. They steered away from conferences and networking. In teaching,

many stated that their logical and organized teaching approaches helped to maintain focus and their personal struggles helped them to be more responsive to their student's needs. However, they also noted that their anxiety, lack of eye contact, their tone of voice, and body language had adverse effects in their classrooms. Surprisingly, only around half of the participant informed their employers of their diagnosis for fear of discrimination.

Another obvious success story is the previously mentioned Temple Grandin. Despite her difficulties as a child, she has earned a Masters degree and Doctorate of Philosophy in animal science from the University of Illinois at Urbana-Champaign. She works as a consultant to companies with large animal slaughterhouses and is the author of *Thinking in Pictures* and *The Autistic Brain*.

Stephen Wiltsher, an amazing artist with autism, has a unique ability. After a 20-minute helicopter ride, he could draw, while listening to his iPod, an 18ft mural of the New York Skyline. His intricate detail is amazing. His talent for drawing began initially as a way of expressing himself. He has drawn Tokyo, Rome, Hong Kong, Frankfurt, Madrid, London, Dubai, and Jerusalem.

Tyler McNamer, author of *Population: One* provides insight into the autistic mind from his point of view. Readers can get a glimpse into his life with autism including his desire to fit in and the obstacles he faced.

It has been suggested that Albert Einstein and Wolfgang Mozart had autism.

Future Research

More research is needed on individual literacy interventions for students with Autism Spectrum Disorder and other developmental disabilities at all grade levels.

Additionally, more research in home-based methods for students with disabilities is needed.

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Appendix A

Reading Interest Survey

Reading Interest Survey

Do you like to read the newspaper?

If yes, place a check mark next to the part of the newspaper listed you like to read:

☐ headlines	☐ editorials	☒ sports
☐ advertisements	☐ columnists	☐ entertainment
☒ comic strips	☐ political stories	☐ current events
☐ others (please list):		

What are your favorite television programs?

Spongebob

How much time do you spend watching television?

What is your favorite magazine?

Animals

Do you have a hobby? If so, what is it?

Youtube

What are the two best movies you have ever seen?

lion king wreck-it-ralph

Who are your favorite entertainers and/or movie stars? When you were little, did you enjoy having someone read aloud to you?

List topics, subjects, et cetera that you might like to read about:

Reading

What does the word "reading" mean to you?

look at the words
and read

Say anything else that you would like to say about reading:

Appendix B

AR Progress

Reading Practice Current Marking Period

Aug 22 Oct 22 Dec 22 Feb 22 **Today** May 31

% Correct

90

goal 85



Points

45.2

No goal set

ATOS Level

4.1

No goal set

Books Read

89

Words Read

105,441

Fiction

50.9%

Nonfiction

49.1%