

Autism Spectrum Disorders and the General Education Classroom:
Strategies for Cognitive and Social Inclusion

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ABSTRACT

This paper examines effective instructional strategies to develop cognitive and social skills in students with autism spectrum disorders in the general education classroom. Students with autism spectrum disorders do indeed contribute to society and are mandated free and appropriate public education. An overview of the historical treatment and education of individuals with disabilities such as autism reveals exclusion in almost every area of life until recently. Only during the past thirty years, have individuals with disabilities been intentionally included both socially and educationally. A critical review of the literature reveals that to foster achievement in the general education classroom, teachers need to support students with autism spectrum disorders both academically and socially through explicit instruction. Due to the range of symptoms of autism, teachers need a breadth of strategies to serve any one student with an autism spectrum disorder. The current trend toward the inclusion of these students demands on-going research to further their academic and social successes.

TABLE OF CONTENTS

TITLE PAGE	i
APPROVAL PAGEii
ACKNOWLEDGEMENTSiii
ABSTRACT	iv
CHAPTER 1: INTRODUCTION	1
Rationale2
The Controversy of Inclusion9
Definitions	12
Statement of the Problem	13
Limitations	13
Summary14
CHAPTER 2: HISTORICAL BACKGROUND	16
Introduction	16
History of Exclusion16
Early History of Public Schools in the United States20
History of Special Education	21
History of Inclusion	24
History of Autism Spectrum Disorders	26
Summary27
CHAPTER 3: CRITICAL REVIEW OF THE LITERATURE	29
Introduction29
Perspectives on Autism and Inclusion	29

Acquisition of Academic Skills	41
Academic Engagement	66
Social Inclusion	85
Summary	121
CHAPTER 4: CONCLUSION	122
Introduction	122
Historical Relevance of Findings	122
Summary of Findings	123
Classroom Implications and Recommendations	128
Suggestions for Future Research	132
Conclusion	134
REFERENCES	136

CHAPTER ONE: INTRODUCTION

Students with developmental disabilities, including autism spectrum disorders, are increasingly included in elementary general education settings in public schools in the United States. This trend toward full inclusion of these students occurred in the past few decades, although much of this progress transpired in recent years (Villa & Thousand, 2000). Today, teachers in general education classrooms will likely teach one or two students with developmental disabilities during any given year. Some of these students will have autism spectrum disorders.

Research in the field of autism has progressed since the revision of the Individuals with Disabilities Education Act (IDEA 1990), PL 94-142. The amendments to this act included the diagnosis of autism as a disability category, guaranteeing such students free and appropriate public education (Vaughn, Bos, & Schumm, 2003). Although legislation mandates the inclusion of students with autism, inclusion has not always been supported with additional training and professional development (Woodward, 2006). If teachers are expected to provide the appropriate education mandated by IDEA and meet national and state standards, they need the training and knowledge to do so.

This chapter will describe autism in the context of the United States society, specifically as it relates to the public school system. It will introduce the argument for effective strategies in teaching elementary students with autism spectrum disorders in general education classrooms and discuss the relevance of these strategies to the greater community. In doing so, it will define key terms and illuminate limitations in the review of the literature.

Rationale

Medical Perspective

Autism spectrum disorder (ASD) is a term that encompasses a range of diagnoses including the classic definition of autism as well as Asperger's Syndrome, Childhood Disintegrative Disorder, Rett's Syndrome, and Pervasive Developmental Disorder-Not Otherwise Specified (Dunlap & Bunton-Pierce, 1999). A range of symptoms characterizes individuals with autism and ASD. The neurologically based disorder affects an individual's ability to engage in social interaction and is compounded by cognitive deficits for many and intellectual gifts for others. The diagnosis varies from individual to individual.

Autism is best characterized as a spectrum of disorders that vary in severity of symptoms, age of onset, and associations with other disorders (e.g., mental retardation, specific language delay, epilepsy). The manifestations of autism vary considerably across children and within an individual child over time. There is no single behavior that is always typical of autism and no behavior that would automatically exclude an individual child from a diagnosis of autism, even though there are strong and consistent commonalities, especially in social deficits (Lord & McGee, 2001, p. 11).

Autism is a developmental disorder that is present from birth or early development (Lord & McGee, 2001). It does not develop later in life although there are many cases of delayed diagnosis.

The incidence of children diagnosed with autism spectrum disorders is increasing, as is the inclusion of such identified children in general education classrooms (Conroy,

Asmus, Sellers, & Ladwig, 2005). In the 1970s, autism was diagnosed in two to five individuals per 10,000 (Lord & McGee, 2001). The more complete diagnosis and the broader definition of ASD are, in part, cause for the increase in its prevalence today. ASD is now one of the most common developmental diagnoses in children (Schilling & Schwartz, 2004). The Centers of Disease Control and Prevention reported that ASD occurs at a level of 1 in every 166 to 500 children (Department of Health and Human Services Centers for Disease Control and Prevention [CDC], 2006). This means that ASD is more common than Down syndrome, diabetes, and cancer in children.

Autism is more common in boys than girls, perhaps at the ratio of three or four boys diagnosed for every girl (Lord & McGee, 2001). To complicate the matter, autism is often coupled with another disability such as mental retardation, but this is more common in girls than boys. Given the prevalence of autism spectrum disorders, supports and services are necessary for these children to experience success in the classroom.

Personal Perspective

In my experiences working in general education classrooms in the Puget Sound area, I have worked with several students with autism spectrum disorders. My observations are congruent with current research findings that demonstrate the inclusion of students with autism at the elementary level. Most of my knowledge is from my experience at a day camp for students with developmental differences and working as a para-educator. What strategies I have found to be effective were not based on research but rather on trial and error. I was responsible for the students with autism spectrum disorders and expected to work effectively with them, but no formal training was required or provided.

If students with autism are to be taught in the general education classroom in accordance with legislation such as IDEA and No Child Left Behind (NCLB), I, and other teachers need to have research and professional reports to guide our practice. With the multitude of symptoms for autism spectrum disorders, a repertoire of strategies to draw from is necessary. There is a critical need for training and information for teachers working with students with autism spectrum disorders and other disabilities exhibited in a general education setting (Woodward, 2006). If we are to teach so that *all* students can learn skills and content knowledge such as those addressed by the Essential Academic Learning Requirements (EALRs) for Washington State, then we teachers must be prepared. This means having a repertoire of strategies available.

Societal Perspective

Schools were designed to teach and prepare children to be active citizens (Spring, 2005). It is expected that upon leaving school, and upon becoming adults, individuals will be able to hold jobs, vote, and contribute to society on many levels. These goals of education are not often extended to children with disabilities. Students who have been passed through the system without having their needs met consequently do not have the voice or the tools necessary to survive in society. Children with disabilities such as autism will inevitably grow up and be a part of society. How they are treated along the way will determine their rate of success as adults, i.e. will they achieve their potential to contribute and participate in society.

The isolation of individuals with disabilities including autism limits their access to many practical tools and social skills development (Spring, 2006). To learn, students need role models, especially in the case of learning social skills. Higher standards lead to

greater success. Unequal educational opportunities disadvantage students with disabilities, limiting their effective integration into society. Rather than becoming effective members of society, they become dependent on others, taking more than giving.

Students are not to blame for their lack of progress (Villa & Thousand, 2000). Their disability does not mean that they are incapable of learning. Rather, it means that they have needs that deviate from what has been normalized in public education. If taught in a community of typically developing peers and taught tools to function, students with autism spectrum disorders, for example, will flourish. They will become independent, and they will know how to be productive members of a community. Because students with disabilities are now more frequently included in general education classrooms than in previous years, teachers need strategies for including them and preparing them for successful integration into society.

Economic Perspective

Until the compulsory attendance laws were enacted at the turn of the century, children with disabilities were not educated in the public school system (Spring, 2005). Education for such individuals was expensive, and more significantly, they were viewed as uneducable. They supposedly benefited from the economic system but did not contribute; they were burdens to society. Then again, the compulsory attendance laws meant that these children would enter the school system and had to be taught. This would necessitate more teachers, and teachers were not enthusiastic. Special education was a solution to this problem. Students with disabilities could be contained in one location, eliminating the need for numerous new teachers. Not only would this plan contain costs, but it would contain “difficult” children as well.

Today, individuals with disabilities are still more expensive to educate than typically developing peers (Spring, 2006). They receive services above and beyond peers such as speech or occupational therapy in addition to special education services. Furthermore, general education teachers can support students without incurring above average costs. Instructional strategies and explicit social skills instruction benefits not only students with diagnoses such as autism but typically developing peers as well. This combination of strategies and skills can better meet the standards of the Essential Academic Learning Requirements. Success for students and society comes from educating all students.

While students with autism spectrum disorders were previously not viewed as contributors to society, attitudes are changing. Individuals with disabilities have indeed made a productive space for themselves, contributing to society in significant ways. Temple Grandin (Future Horizons, Inc., 2005) and Dawn Prince-Hughes (Prince-Hughes, 2004) are both women who have done so in spite of or as a result of a diagnosis of autism. They both progressed through public schools and went on to earn their PhDs.

Grandin did not speak until she was three and a half and her parents were told to send her to an institution (Future Horizons, Inc., 2005). She has since become a renowned author and researcher. Grandin developed more humane and efficient livestock handling facilities used by many large corporations. She examined ways to reduce animals' psychological distress during handling, increasing productivity. Her autism contributed to her success in her connection and undivided attention to the animals.

Prince-Hughes is a local author and researcher who surpassed even her own expectations, in spite of all her challenges in school (Langston, 2004). She had obsessive interests and sensory additions that were a challenge. In school, she used most of her energy to sort out the overload of sensory stimuli in the classroom. Though not diagnosed with Asperger's syndrome, an autism spectrum disorder, until she was an adult, she researched gorillas at the Woodland Park Zoo in Seattle and also performed research with Jane Goodall. Furthermore, she became an adjunct professor at Western Washington University.

Grandin and Prince-Hughes, in past years, would have been considered a drain on society and would not have been educated. We would have lost their economic and creative humanitarian contributions to society. The education of those with disabilities allows them to prosper and benefit society. Grandin and Prince-Hughes's autism and coincidentally their connections to animals are qualities that cannot be taught but can be influential (Future Horizons, Inc., 2005; Langston, 2004). Given better strategies for teaching these women and others with autism, even more individuals with disabilities could contribute to society in such positive ways. Educating individuals is not a burden. Many such individuals become active citizens, and integrate into social and economic systems. Noted civil rights historian and author, Taylor Branch pointed out that when oppression, as in the lack of education, is removed both the oppressors, the oppressed, and society as a whole benefit (Branch, 2007).

Educational Perspective

The prevalence of autism in children has increased over the past 30 years but especially since the inclusion of the classification under IDEA in 1990. In 1994, special

education services in public schools served 22,664 students under the classification of autism (CDC, 2006). It was the tenth most common developmental diagnosis in children ages 6 to 21. Since then, the incidence has increased six-fold to just over 141,100 students in 2003, and that number has since increased. It is now the sixth most common diagnosis. As significant as these numbers are, even more important is that there are children with autism spectrum disorders in general education classrooms who do not qualify for special education services. These students are still in need of support from teachers.

This increase in students with autism spectrum disorders and the high level of necessary intervention is an enormous challenge for public education. Many of the students with autism are included in general education settings whether or not they receive some form of special education services. Particularly lacking in special education are services for students with high-functioning autism (Woodward, 2006). These students, usually placed in general education classrooms, remain a challenge for teachers. “It is not surprising that otherwise skilled and competent educators and school-based professionals frequently report that they considered themselves to be less than fully capable of serving the needs of students identified as having ASD” (Simpson, de Boer-Ott, & Smith-Myles, 2003, p. 116). These facts support the need for research and the related training for teachers.

For many teachers, working with individuals with ASD is a challenge. “Although children with ASD exhibit a wide variety of behaviors and developmental levels, difficulty with engagement, attention, and appropriate behavior in the classroom are common and interfere with students’ ability to participate in the educational mainstream”

(Schilling & Schwartz, 2004, Introduction, ¶1). Autistic behaviors such as stereotypy and obsessions are described as distracting to teachers and to other students.

Unfortunately, there is not one solution that will work for all individuals. Rather, general education teachers must have a repertoire of strategies on both cognitive and social levels for working with individuals with autism spectrum disorders. Teachers simply need the confidence and competence to support students with autism (Villa & Thousand, 2000).

The Controversy of Inclusion

The placement of individuals with disabilities into general or self-contained classrooms is one of the most debated issues in special education. In the 1990s came a paradigm shift in the way children with disabilities were educated. The current trend is now toward the inclusion of students in general education classrooms but the debate rages on (Ysseldyke, 2000).

Many people resist the trend towards inclusion for a variety of reasons. One of the prominent opponents of inclusion is the American Federation of Teachers (AFT), a teachers union (Ysseldyke, 2000). They cited teacher training and support staff as inadequate to meet the needs of students with disabilities. They argued that inclusion was simply an effort to reduce costs and not actually to meet the needs of students. They added that inclusion would be too great a challenge for general education teachers and difficult for the students as well.

Furthermore, many general education teachers do not believe that inclusion helps typically developing students or students with disabilities (Spring, 2006). Seventy percent of classroom teachers objected to the inclusion of students with disabilities. Many worry that inclusion negatively affects everyone involved and that little is actually

learned in the process. The American Federation of Teachers reported "...teachers and support staff are not receiving adequate training for educating children with disabilities in regular classrooms" (p. 96).

Some parents are also wary of inclusion. Studies on inclusion have shown that parents of typically developing students are fairly satisfied with separatist educational policies (Kasari et al., 1999). They worry that the teachers' time will be disproportionately spent on students with disabilities and distractions in the classrooms. On the other side of this argument, some parents of children with disabilities cite the specialized training of special education teachers as the reason for keeping their children in self-contained classrooms. Kasari et al. found this to be particularly the case for some parents of children with autism.

There are several problematic aspects to separatist educational policy (Villa & Thousand, 2000). The concern about including students with disabilities in a general education classroom stems from a deficit model negating the students' abilities and focusing on their disabilities. Students may be placed in settings that are not congruent with LRE legislation and in self-contained classrooms where performance expectations may be lower than those in inclusive classrooms. Students in self-contained special education classes are not achieving all they are capable of achieving, and they are not prepared to be active members of society. The separatist movement is reactive, responding to the protest of teachers, rather than proactive, meeting the needs of individual students. Inclusion develops a cooperative relationship among parents, teachers, and administrators.

Parents are at the forefront of the inclusion movement (Villa & Thousand, 2000). Their point of view is that a disability is not the whole of someone's identity. Denying a person from certain education based on their disability means denying the person's identity and value as an individual. Parents want their children to be included in classrooms that replicate the rest of society. They do not want their children to be excluded and limited in their possibilities. That is, many students can only reach their potential in a general education classroom where they constantly and continually learn from their peers.

In agreement with parent groups, the National Association of State Boards of Education asserted that inclusion is the solution to the debate (Spring, 2006). They were also clear that inclusion could not be successful without support of teachers. Including students with disabilities in the general education classroom, however, does not inherently guarantee respect and success (Villa & Thousand, 2000). Social and emotional inclusion are as critical. Special education teachers can team-teach or otherwise provide for the specific curricular and inclusive needs of students with disabilities. Inclusion is often cited as a way to build teams who advocate for the needs of individuals.

The Individuals with Disabilities Education Act of 1990, PL 101-476, mandated that student placement be based on individual needs rather than on a labeled diagnosis (Villa & Thousand, 2000). It required the enrollment of students with disabilities in their Least Restrictive Environment (LRE). LRE is a concept that supports the inclusion of students with disabilities in general public education physically, cognitively, and

emotionally to the greatest extent possible. This increases educational success for students with disabilities.

Regardless of the debate over inclusion, more and more students with disabilities are enrolled in general education classrooms at least part time. “Much has been accomplished and much remains to be done so that all students with disabilities are welcomed, valued, supported, and educated in shared classroom and school environments to attain the desired goals of education (e.g., belonging, mastery, independence, generosity) (Villa & Thousand, 2000, p. 27).”

Definitions

Autistic Spectrum Disorder (ASD): “...a continuum of impairments in the development of social interaction, communication and consequent rigid, repetitive behavior’ ...the continuum ranges from the most profoundly retarded to the ‘most able, highly intelligent person with social impairment in its subtlest form as his own disability’” (Nadesan, 2005, p. 14). The spectrum includes Autism, High Functioning Autism, Asperger’s Syndrome, Semantic Pragmatic Disorder, Childhood Disintegrative Disorder, Rett’s Syndrome, and sometimes Attention Deficit Disorder and Attention Deficit Hyperactivity Disorder.

Inclusion: A term that varies from person to person but encompasses some form of integrating individuals with disabilities into a general education setting. The range includes partial, for academic or nonacademic activities, to full inclusion. The truest form of inclusion includes heterogeneous grouping, a sense of belonging, shared activities with individualize outcomes, use of environments

frequented by students without disabilities, and a balanced educational experience (Villa & Thousand, 2000).

Individualized Education Plan (IEP): A written, implemented, and reviewed plan developed to meet the special learning needs of each student with disabilities (Vaughn et al., 2003, p. 4).

Individuals with Disabilities Act (IDEA): Legislation “. . . to ensure an effective and individual education designed to address each child’s unique needs in the least restrictive environment” (Ysseldyke, 2000, p. 80). Amendments were made to the original Education of all Handicapped Children Act of 1975, PL 94-142, in 1990, 1997, and 2004.

Least Restrictive Environment (LRE): A continuum of educational services for students with disabilities that ranges from the least restrictive environment of a full-time general education classroom to the most restrictive environments such as a residential school, treatment center, or homebound instruction (Vaughn et al., 2003, p. 5).

Statement of the Problem

Students with autism spectrum disorders, similar to other students, are in need of teacher support, and many of their teachers are inadequately trained. Unfortunately, this is detrimental to the student’s learning and potential for the future. The purpose of this paper is to investigate strategies general education teachers can employ to support and teach students with autism spectrum disorders. These strategies support both the cognitive development and the social development of students. Elementary teachers have a particular responsibility to support more than the cognitive abilities of students, as

social skills develop significantly during the earlier years. Since each student diagnosed with autism spectrum disorder varies in his or her needs and abilities, particular attention to a multiplicity of strategies is necessary. This paper will specifically address this need by critically evaluating current research in the education field.

Limitations

Much of the research included in this literature review was conducted with a single or few participants. In addition, research has primarily focused on early childhood education while students beyond that stage of development may have additional unmet needs. While the research may be valid and reliable, it is impossible to generalize the results to all students with autism spectrum disorders. Given this limitation and the variable nature of autism and autism spectrum disorders, no one strategy will work for all students. The specific strengths and weaknesses of each child must be assessed in the implementation of any program. Not all of the research reviewed in this paper will apply to all or even most students with autism or autism spectrum disorders, thereby necessitating a variety and balance of approaches depending on age and setting.

Summary

This chapter introduced the argument for effective strategies for general education teachers of students with autism spectrum disorders. It developed autism in the context of public education and United States society today. In addition, it illuminated the controversy of inclusion and defined key terms and limitations of the literature review.

Chapter two will provide the historical background of the treatment and education of individuals with disabilities. It will describe the historical exclusion of individuals with disabilities as well as the history of public schooling in the United States. Further

discussion will include the history of special education leading to the inclusion movement. Lastly, the history of autism will be reviewed in preparation for subsequent literature reviews.

CHAPTER TWO: HISTORICAL BACKGROUND

Introduction

Chapter one specifically addressed the argument for effective strategies for teaching students with autism spectrum disorders in the general education classroom. It reviewed the relevance of the question to the educational community and beyond and provided introductory information. Definitions of terms used in the literature as well as limitations of the research were presented.

Chapter two will review historical trends in the treatment of and education for individuals with disabilities. It will begin with an overview of the historical exclusion of individuals with disabilities. Following that will be the history of public schooling in the United States and an introduction to special education. The chapter will conclude with the history of inclusion and autism that are critical to understanding the current trends in educating students with autism spectrum disorders.

History of Exclusion

Throughout history, individuals with disabilities have fallen victim to the prevailing societal views (Fecteau, 2003). Consequently, these individuals have suffered greatly at times. Fluctuating periods of asylum and isolation occurred throughout many historical periods. The treatment and education of those with disabilities reflects the values of society (Spring, 2005).

Christianity was a major influence during the Medieval Ages and during the Renaissance as well. Individuals with disabilities sometimes served as beggars to make money for family (Fecteau, 2003). At the same time, however, they were also viewed as half devils whose disabilities were brought on by devils and demons. This led to the

accusation that such individuals were involved in witchcraft, as were their mothers for giving birth to witches. In literature and in entertainment, clowns and court jesters were commonly people with disabilities. In either case, supported or removed, individuals were not included in mainstream society.

In the Romantic Era came pity and segregation (Fecteau, 2003). Through literature and stories, people with disabilities were not acknowledged as individuals but, rather, pitied for their condition. Families cared for most individuals with disabilities rather than isolating them in institutions. This change, however, did not mean that individuals were fully accepted as members of society.

Hard economic times shed a negative light on individuals with disabilities in the Colonial Era of the United States (Noll & Trent, 2004). If the family could not care for an individual, institutionalization ensued. Institutions solved the communal responsibility of “feeble-minded” individuals beginning in the late 1600s. Throughout the eighteenth century, almshouses were increasingly opened to house individuals with disabilities.

Welfare and educational policy developed and expanded at the beginning of the nineteenth century, providing for a shift in care for the poor and the disabled, primarily those who were deaf or blind (Noll & Trent, 2004). However, not all individuals with disabilities experienced increased services. The almshouse, once an unpopular last resort, became a common practice throughout the country. They housed the poor and the “idiots and lunatics” who, unfortunately, were frequently abused (p. 49). A common view was that a disability was a result of a violation of natural laws such as interfamilial marriage, self-abuse, or other forms of immorality as defined by the authorities. Some claimed that

the creator would not have failed a human in such a way, so something else must be at fault. Furthermore, parents were blamed for their child's inadequacies.

As explained by Noll and Trent (2004), views about developmental differences were part of a larger societal perspective.

“...Mental retardation history is reflective, rather than formative, of the larger course of events in American society...part of broader trends toward state paternalism, toward the application of science to social policy, and toward the redefinition of many differences as pathological deviations from normality, to be studied and controlled. They reflect anxieties about an America that was becoming more diverse...” (Noll & Trent, 2004, p. 79)

In the late nineteenth century, policy makers declared that all individuals with mental retardation were, by nature, potential criminals, and should be treated as such (Noll & Trent, 2004). This government stance added legitimacy to the eugenics movement that focused on genetic cleansing to improve the health and intelligence of society. Social implications abounded, and the little support that already existed for individuals with disabilities was eliminated.

Henry Goddard (1866-1957) was a psychologist whose interests bridged the rift between religious efforts and scientific understanding (Noll & Trent, 2004). His thinking further reflected the traditional Christian beliefs and social influence of the time.

Goddard believed that “feeble-mindedness” was genetic and problematic for society, hence his interest in eugenics. Feeble-mindedness covered all degrees of mental defect, determined by new intelligence testing. The classifications in increasing levels of functioning were idiots, imbeciles, and morons. Today, those previously classified as

morons are now often enrolled in general education classrooms, functioning and learning with all others.

Goddard was renowned for his research on the Kallikak Family that began in the early 1900s. His description of the Kallikak Family played into the social fears of immorality (Dakwa et al., 2003). He divided the family into two genetic strains, one evil and one good, originating from one progenitor, Martin Kallikak, Sr. He had an illegitimate son with a feeble-minded woman. The descendants of this genetic strain were deemed evil and plagued with feeble-mindedness and sexual immorality. Conversely, the offspring of his later legitimate wife were part of the good genetic strain. All children were born “normal.” Goddard brought together biblical, medical, and scientific reasoning in a powerful book written for the lay reader, which was quickly accepted as factual (Noll & Trent, 2004). This research labeled individuals and set the stage for removal of individuals with disabilities from society as illustrated below.

The individuals Goddard coined as morons (IQ of 51-70) were claimed to be dangerous because they appeared normal but were really “high grade defectives” with sub-level intelligence (Dakwa et al., 2003, Introduction, ¶2). He asserted that they were likely to engage in sexually immoral and criminal activities. Goddard feared that the feeble-minded were reproducing so quickly that they would “clog the wheels of human progress” (Goddard’s Recommendations, ¶1). His views were highly regarded and his book was a best seller. Such popularity further supported refusing education for individuals with disabilities. As such, they were removed from society and housed in isolated colonies.

Despite Goddard's eventual change of opinion on his own research, his findings were used throughout the world (Noll & Trent, 2004). The data on the Kallikak Family was actually used in a Supreme Court case in 1927 that legalized involuntary sterilization in the United States. The Nazis also used Goddard's argument as evidence for forced sterilization in the 1930s.

Many arguments were used throughout history to exclude individuals with disabilities (Dakwa et al., 2003; Fecteau, 2003; Noll & Trent, 2004). In any context, they were denied consideration as productive members of society. This context of exclusion was a premise in the creation of public schools in the United States.

Early History of Public Schools in the United States

Schooling has never been just about learning. It does not stand alone, unaffected by society and popular belief (Spring, 2006). Schools are a reflection of society and the division along historic, political, societal, and economic lines. In an education system originally designed to promote active citizenship and leadership, individuals with developmental differences were logically and naturally excluded because they were not deemed to be capable of such leadership and commitment to society. Only certain groups were actually educated to the fullest extent possible.

Public schools were specifically created to educate future leaders for a republican government (Spring, 2005). As such, student selection was a topic of much debate. As an intentional move of the education system of the Revolutionary Era, Thomas Jefferson promoted the idea of meritocracy in the late 1700s. Meritocracy was a system that allowed entry regardless of ability and social standing, and success would be in the hands of the student. In such a manner, the best individuals for leadership would have the

opportunity, not just the elite. Education was not considered necessary to be a good citizen but it was imperative to be a good leader.

Horace Mann debated Jefferson's course of action for education. Mann argued that schooling was the key to a successful society and that a common creed was imperative for that end goal (Spring, 2006). The idea of human capital expounded that teaching children would benefit the whole in the future. Children would grow up to be workers and to care for the elderly. Students would, in Mann's system, have the opportunity to compete for jobs and wealth, thereby eliminating poverty. Schooling would eliminate crime and teach moral values to children. Still, children with disabilities were excluded.

History of Special Education

Even as children with disabilities were finally welcomed into family life in the United States, they were excluded elsewhere in the early 1800s (Noll & Trent, 2004). Horace Mann and the Common School movement excluded children with disabilities, as a rule, from the education system. These children were deemed to be the enemy of the state, undisciplined and gluttonous. School books equated goodness with quick learning thereby eliminating those with learning disabilities.

Students with disabilities were excluded from schooling simply because of the cost of their education. Local and state officials neglected them in many ways and sent them to institutions with no standards for care or education. In fact, many individuals with disabilities were quarantined in state institutions for the mentally retarded or ill regardless of their cognitive capabilities. The label of a disability alone was cause enough for institutionalization. Due to lack of or inappropriate assessment of individuals

in institutions, residents did not receive the care they needed nor the education they deserved (Spring, 2006).

The compulsory attendance laws that came into effect at the end of the nineteenth century during the Common School Era opened doors to the beginnings of special education (Spring, 2005). Teachers resisted these laws because it meant that they would have to accommodate children with disabilities. The attendance laws did not eliminate the exclusion of children with disabilities or behavior problems; they merely changed its appearance. Children with disabilities were now segregated within the school for humanitarian and economic reasons, as the argument stood. They were costly to educate and deemed burdens in the classroom. It was not until the 1920s that special classes took broader forms. Such classes were labeled “Open Air,” “Crippled,” “Deaf,” “Subnormal,” and “Disciplinary.” In just four years, from 1921 to 1925, the enrollment in the Subnormal classes dramatically increased from 56 to 1,179 students in Baltimore schools. The purpose of the special education class was to mediate the compulsory attendance laws and the teachers’ complaints of chaos in the classroom. Segregation by ability/disability was standard in United States public schools.

While the Brown versus Board of Education case in 1954 was a turning point for people of color, it was also a stepping-stone for individuals with disabilities, legally beginning their fight for equal rights in education. Individuals with disabilities were able to expand upon the civil rights movements of the time (Spring, 2005). In 1958, PL 84-926, The National Defense of Education Act, allocated funds to train teachers of the mentally retarded and other handicaps. This was the first time that funds were actually assigned to special education, a sign of the changing social milieu of the times.

It was not until the 1960s, however, that students with disabilities were considered within the “context of equality of education” (Spring, 2006, p. 90). Activism and legal action ensued in this and the following decade. The political environment provided a battle ground for a struggle for securing school funding and rights for individuals with disabilities. As pressure on local and state governments proved unfruitful, organizations such as the Pennsylvania Association for Retarded Children formed. This organization and others, including the National Association for Retarded Children, challenged laws that excluded children with disabilities and argued for the educability of such individuals. Programs to train teachers of the mentally retarded and otherwise disabled were mandated. The task of changing laws to be inclusive and equitable was not easy, and it still continues today in educational settings and legislatures.

In the early 1970s, legal challenges secured the right to an equal opportunity for the education of all retarded or handicapped children. Lack of funding did not allow for exemption. Deinstitutionalization laws arose with the 1971 Wyatt versus Stickney ruling in Alabama. The court ruled that residential state schools and institutions had the constitutional duty to provide educational services for residents (Noll & Trent, 2004). In 1973, section 504 of the Vocational Rehabilitation Act banned the exclusion of handicapped individuals from federally funded programs based on their handicap. This momentous legislation provided the legal backing for individuals with disabilities to obtain their rights as citizens. In 1975, despite these laws, 1.75 million children were still excluded from public education based on handicaps.

In this same year, Public Law 94-142, The Education of All Handicapped Children, was enacted and mandated free and appropriate public education for all

handicapped children regardless of the severity of their disability (Vaughn et al., 2003). It protected not only the rights of children but also rights of their parents. It, furthermore, outlined the governance of students with disabilities in public schools. Individualized Education Plans (IEPs) and Least Restrictive Environment (LRE) mandates were included in this law. Specific educational goals were set for students, and they were placed in the most integrated setting possible. These public laws were precursors to the Individuals with Disabilities Education Act (IDEA). Thus began a new era of inclusion.

History of Inclusion

The enactment of the Americans with Disabilities Act in 1990 granted legal citizenship to individuals with disabilities. Since the Colonial Era, the government controlled access of individuals with disabilities to public goods. Now, individuals with disabilities were legally recognized and guaranteed reasonable accommodations at the worksite and in all areas of public life. Another change in 1990 occurred with the renaming of PL 94-142 to PL101-476, the Individuals with Disabilities Education Act (IDEA) (Vaughn et al., 2003). First and foremost, it established person-first language, defining the individual by their personhood rather than their disability. In addition, it extended education services from age 16 to 21 to provide transition services for employment. Two new categories of disability were added: autism and traumatic brain injury. Adding the diagnosis of autism to the law enhanced services and research in the field. This same year, the Autism National Committee was founded to support individuals diagnosed with autism.

IDEA underwent further revision in 1997 and 2004. The first revision, PL 105-17, IDEA 1997, mandated education for individuals with disabilities even during

expulsion, and required that schools assume greater responsibility for students' access to curriculum (Vaughn et al., 2003). General education teachers could now conference with special education teachers to provide better services for individual students.

Transportation was also included for students with disabilities. This inclusion was particularly important, as students did not always attend their neighborhood schools depending on where services were provided.

The latest revisions of PL 108-446, IDEA 2004, added new definitions to align the existing law with the No Child Left Behind Act of 2001 (NCLB) (Vaughn, Bos, & Schumm, 2006). This version further defined "parent," "core academic subjects," and "assistive technology." It also mandated transition plans for graduating students, participation in assessments with accommodations, and school nurse and interpreting services. Schools could also no longer change services provided without parent consent.

Until the 1990s, the inclusion movement was considered to be separate from general education reform efforts (Villa & Thousand, 2000). While goals and research may have been similar for both groups, the efforts were not previously viewed as mutually inclusive. The 1990s was a decade focused on quality education and excellence. The 1997 Department of Education's Annual Report to Congress stated,

Historically, we have had two education systems, one for students with disabilities and one for everyone else. We are working to create one educational system that values all students. The regular classroom in the neighborhood school should be the first option for students with disabilities. Administrators and teachers must receive the training and the help they need to make that the best option as well. (Villa & Thousand, 2000, p. 14)

The debate over inclusion is increasingly moving beyond special education and becoming part of the larger school reform movement.

After hundreds of years of exclusion, individuals with disabilities are now included in public education and protected legally. There has been a fundamental shift in education to include students with disabilities, including autism spectrum disorders, in the general education classroom with support as necessary.

History of Autism Spectrum Disorders

Despite the recent rise in the incidence of autism spectrum disorders, it is not a new condition (Scheuermann & Webber, 2002). The term autism, meaning “escape from reality,” existed long before the diagnosis (Wobus, 2006). One of the earlier documented accounts of a child potentially diagnosed with autism was in 1803 (Scheuermann & Webber, 2002). Jean-Marc Gaspard Itard, a physician, wrote about a boy, who appeared to be about 11 years old, living in the wilds of France. At that time, the boy could not speak and did not attempt to communicate. He preferred objects to human interaction and often engaged in socially inappropriate behaviors. Itard and his colleagues named the boy Victor and taught him to communicate and other life skills.

In spite of Itard’s early report, the diagnosis of autism was not named nor defined until 1943; it was first considered to be a form of Childhood Schizophrenia. “Kanner, a psychiatrist, described 11 children ‘whose condition differs so markedly and uniquely from anything reported so far, that each case merits...a detailed consideration of its fascinating peculiarities’” (Scheuermann & Webber, 2002, p. 2). Individuals with autism spectrum disorders, at that time, were often diagnosed with Kanner Syndrome. At the same time as Kanner’s findings, Hans Asperger made similar discoveries, though all of

his patients were verbal (Wobus, 2006). Thus, the name Asperger's syndrome has since been utilized for higher-functioning individuals with typically developing verbal capabilities.

Following the diagnosis of autism was the observation that very few children with autism had warmhearted parents (Wobus, 2006). This observation led to the conjecture that one cause of autism might be lack of parental nurturing. Children were even removed from their parents for recovery. Future studies would disprove this theory, but such an assumption is still maintained by some.

Despite the debates of the biological versus cultural causes of autism (Nadesan, 2005), recognition of autism as a legitimate diagnosis continued. The IDEA 1990 designation of autism as a category of disability broadened educational opportunities for these individuals (Vaughn et al., 2003). The legal status mandated free and appropriate public education for individuals with autism.

Summary

This chapter examined the systematic exclusion of individuals with autism spectrum disorders in the formation of public schooling, connecting their lack of educational opportunities to social and political trends. In addition, this chapter outlined legislation crucial to the development of special education and the recent shift to inclusion. Finally, history specific to autism was outlined to illuminate social labels.

Chapter three will analyze current educational research in teaching children with autism spectrum disorders. It will encompass strategies to support both the cognitive and social development of elementary age students primarily in general education settings. Topics will address perspectives of autism and inclusion as well as the acquisition of

academic skills, academic engagement, and social inclusion for students with autism spectrum disorders.

CHAPTER THREE: CRITICAL REVIEW OF THE LITERATURE

Introduction

Chapter two provided an overview of treatment and education of individuals with disabilities throughout history including eras of exclusion and the early history of public schooling in the United States. It further outlined the history of special education encompassing the inclusion movement. Additional attention was given to the history of autism in relation to historical events and trends.

Chapter three will critically review recent research literature on strategies for teaching elementary students with autism spectrum disorders. This research will describe the education of children with autism primarily in the general education classroom but also includes self-contained and non-school settings. Reviews of research on perspectives of autism and inclusion will develop a broader portrayal of challenges for children with autism spectrum disorders. Given the importance of academic and social challenges for students with autism, this chapter will examine research on the topics of the acquisition of academic skills, academic engagement, and social inclusion.

Perspectives on Autism and Inclusion

The perceptions and perspectives of others play a significant role in the success of students, particularly those with disabilities. They frame the interactions and therefore the education of students. The following research will examine views of teachers, parents, and peers on the inclusion of students with autism spectrum disorders in general education settings (Kasari, Freeman, Bauminger, & Alkin, 1999; Swaim & Morgan, 2001; Robertson, Chamberlain, & Kasari, 2003; Zionts, Zionts, Harrison, & Bellinger, 2003).

Robertson et al. (2003) examined the relationship between general education teachers and second and third graders with autism. They questioned the effect of problem behaviors on the relationship and their social inclusion. Of interest was what factors affected the quality of the student-teacher relationship.

The criteria for the inclusion of the targeted students in this study were that autism was included in their IEPs, they had a clinical diagnosis of autism, they had a minimum verbal of full-scale IQ of 70, and they were enrolled full-time in a general education classroom. The students with autism were invited to participate in the study by local clinicians, school districts, and parent groups. All students were enrolled in the classrooms for at least six months before data was collected to ensure the development of social relationships.

Of the 187 second- and third- graders who participated in this study, 12 students had autism, 10 male and 2 female. The 12 urban general education classrooms were inclusive and drew from two middle-class school districts. Half of the students with autism were supported by paraprofessionals. Furthermore, the students with autism were the only students with developmental or learning differences in their classrooms. Eighty-three percent of the general education teachers reported that they had never had a student with autism in their classroom and 50% had never had a student with special needs (Robertson et al., 2003).

The researchers (Robertson et al., 2003) relied on interviews and questionnaires for data collection. Teachers completed the *Student-Teacher Relationship Scale* and the *SNAP-IV Rating Scale* to determine the teachers' impression of their relationship with included students with autism and the behavioral characteristics of the same students.

The classmates also completed a measure assessing their impression of their classroom social environment.

Correlation analyses were conducted for measures on the *Student-Teacher Relationship Scale* (Robertson et al., 2003). Teacher closeness was found to be negatively associated with conflict ($n = -.40$) whereas conflict was found to be positively correlated to dependency ($n = .46$). Teachers generally reported positive relationships with the students with autism in their classrooms, though an increase in maladaptive behaviors did have a negative effect on the aforementioned relationship.

A moderate to high correlation was found between child maladaptive behaviors and teacher-student relationships (Robertson et al., 2003). Behaviors of inattention ($p = .005$), hyperactivity/impulsivity ($p = .05$), and opposition/defiance ($p = .005$) were all determined to be positively associated with teacher relationships characterized by conflict. Additionally, hyperactivity/impulsivity, and opposition/defiance were also determined to be positively associated with dependency ($r = .68$ and $r = .97$ respectively, $p = .05$ for both). On the other hand, inattention was found to be negatively associated with closeness ($r = .76$, $p = .005$).

Of the 12 target students with autism, 25% reached the highest level of social inclusion with peers (Robertson et al., 2003). The majority of target students, 41.7% received a rating of two whereas 33.3% received a rating of one for social inclusion. Using a Chi-square analysis, these results were comparable to those of their peers with no significant difference in social inclusion between students with autism and their typically developing peers.

A moderate association was also found between teachers' beliefs about their relationship with target students and the students' social inclusion (Robertson et al., 2003). Relationships driven by both conflict ($r = -.55$, $p = .06$) and dependency ($r = -.59$, $p = .05$) demonstrated a negative association with the students' social inclusion. For the problem behaviors, a high negative correlation was found between inattentive behaviors and level of social inclusion ($r = -.71$, $p = .01$) and non-significant correlations for both hyperactivity/impulsivity and for opposition/defiance.

Of note was that student-student relationships did impact the teacher-student relationship with students with autism and vice versa (Robertson et al., 2003). The authors concluded that students with autism were in fact socially integrated with their typically developing classmates. Nevertheless, the teacher-student relationship was critical to that social inclusion.

However, the authors (Robertson et al., 2003) did not appear to ensure random sampling. Given the nature of autism and the limited number of participants in this study the conclusion that students with autism were socially integrated seemed over generalized. Given the need to build a corresponding school culture, the results are worth consideration as evidence of how relationships influence the inclusion of students with autism spectrum disorders.

Teachers are not the only influential adults in students' success, parent perspectives and perceptions are influential as well. Kasari et al. (1999) examined the effects of diagnosis, age, and current educational program on parental perspectives of inclusion. The subsequent study addressed both the current educational setting of the student and the parents' wishes for an ideal context.

The parents in this study had either a child with autism or with Down syndrome. Surveys were sent out to the members of two parent associations in Southern California (Kasari et al., 1999). Of the respondents, 113 were parents of children with autism and 149 were parents of children with Down syndrome. Forty percent of the parents of children with autism responded to the surveys. The average age of the children with autism was 7 years 3 months, with a range of 2 to 18 years. Of the families, 81% identified as European American, followed by 10% Asian American. Forty-six percent of children were below age level. Twenty-eight percent were at or above age level with the same percent unsure. Thirteen percent of the students were enrolled in early intervention programs, 15% in general education, and 72% in special education to include autism only programs as well as academic and social mainstreaming.

The surveys consisted of multiple choice questions, descriptive information, current educational placement and satisfaction, and ideal educational placement (Kasari et al., 1999). The categories of education ranged from a special school to academic mainstreaming. Satisfaction with those settings was rated on a five-point Likert scale. Questions addressed advantages of current settings and the consideration changing the child's placement. They also addressed parents' ideal setting for their child and possible advantages to that setting. Lastly, there was additional space for written comments.

Calculated measures included satisfaction and change, ideal program, and advantages of current program (Kasari et al., 1999). The first analysis for satisfaction and change was group differences. Of parents of children with autism, 46.0% were found to desire a change of setting. Overall, parents with children in special education were less satisfied than parents with children in general education ($F(2, 259) = 12.67, p <$

.001). Also, chi-square analyses revealed that a higher percentage of parents with children in special education (49%) wanted change than parents of children in early intervention (39%) or general education (28%) settings ($X^2(4) = 14.62, p < .01$).

Teachers, though, were of greater significance in special education settings, particularly for parents of children with autism (Kasari et al., 1999). Parents of children with autism were 500% more likely to cite teachers as an advantage than in the other contexts (odds ratio [OR] = 6.00, $p < .0001$). Though the survey respondents frequently indicated that teachers were important for making the educational setting desirable, the curriculum was not. Fifty-seven percent of parents with children in special education did not choose curriculum as an advantage for their child (OR = 0.0436, $p < .01$).

Written response on the survey was optional, although 73% of the parents of children with autism completed this section (Kasari et al., 1999). The child's level of functioning was determined to be of greater influence for decisions about inclusion for parents of children with autism (58%) than for those with Down syndrome (20%). Parents of children with autism were more likely to desire specialized education or special attention to autistic behaviors (23 respondents).

Kasari et al. (1999) found that more than half of parents of children with autism were not satisfied with their child's current educational setting. Parents with children with autism were more likely to choose a mainstreaming option rather than full inclusion. They expressed concerns about the social challenges and academic needs in a general education classroom. Parents expressed conflict about the importance of the teacher verses the curriculum.

Kasari et al. (1999) drew conclusions based on the results but did not generalize the results to others groups of parents with children with disabilities. The one generalization was that parent perceptions were important in supporting educational opportunities for their children. Given the percentage of respondents and the multiple-choice nature of the study, conclusions can be viewed with some caution but not dismissed.

While the developmental diagnosis of a child might have had an effect on the educational decisions of parents, so might have the child's or family's ethnic background. The following study (Zionts et al., 2003) investigated the perceptions of parents with children with severe emotional or cognitive disabilities on their special education services. Interviews addressed both the perceptions of interactions between the school personnel and parents and the school personnel and students with disabilities.

The authors (Zionts et al., 2003) recruited African American parents from local parent support and after school programs. They sent out e-mails and paper copies of information to the groups and also held presentations. This choice of recruitment was intentional to prevent schools from nominating parents already supportive of their own practices.

The participants lived in two large metropolitan areas (Zionts et al., 2003). They were the parents of 24 children with moderate to severe disabilities, of whom 5 had autism. All of these students were enrolled in the public school system. Four of the students with autism were male and 1 was female with ages of 7 to 10 and 1 individual who was 23. All of the parents in the study identified as African American.

Semi-structured interviews elucidated parental perspectives on the impact of their race or ethnicity in the special education system (Zionts et al., 2003). Two African American graduate students with prior experience and training in interviewing and special education held the interviews. Interviews were set up at the parent's convenience and audio taped for later transcription and review. Additionally, handwritten notes were taken during the interviews, which lasted an average of 1 hour 15 minutes.

Each transcript was read and reread to detect common themes. Then, each transcript was coded for the themes by one of the researchers. To ensure reliability, another researcher also coded the transcripts and discrepancies were discussed. Lastly, the authors (Zionts et al., 2003) grouped the coded transcripts by theme.

Six major themes surfaced through the interviews. They were as follows:

1. respect for parents and children by school personnel,
2. perceived negativity toward children and/or parents by school,
3. need for information and assistance using community support services,
4. desire for greater cultural understanding and demonstrated acceptance of differences by school personnel,
5. issues of quality and training among teachers and other school personnel,
and
6. improved teacher-parent and parent-parent partnerships. (Zionts et. al., 2003, p.44)

For the first theme of respect, 64% of the parents who identified as African American were found to not feel respected by school personnel (Zionts et al., 2003). They also did not feel that their religious beliefs were respected. Not only were the

comments from school personnel of issue to the parents but also were the displayed behaviors from the same individuals. More than one-third of the parents did not feel treated as partners in child's education.

Half of the parents were found to perceive negativity toward their child or themselves in some capacity at school (Zionts et al., 2003). Many felt unfairly blamed for their child's disability based on teacher comments of discipline or lack of caring. Zionts et al. concluded that lack of respect from school personnel was common among families who identified as African American.

Parents were also found to feel that more support from schools in accessing community services and knowledge would be beneficial (Zionts et al., 2003). While 58% of parents did know about community-based services and used at least one such agency out of school, a significant portion of parents did not use any community services outside of school. Those of lower socioeconomic status saw their income as a barrier to receiving further services. They also requested training for themselves to better support their children. The authors concluded that parents were not always given the information necessary to support their child throughout development.

The issue of cultural understanding and acceptance was found to be critical for parents (Zionts et al., 2003). A few parents requested training for teachers to better understand the characteristics of their child's diagnosis well enough to be able to differentiate between disability and culture. They wanted teachers to acknowledge cultural differences that influenced a child's behaviors and to respect these boundaries.

Forty-one percent of parents were not aware of the push to train teachers in cultural understanding and sensitivity (Zionts et al., 2003). Many parents (57%) did not

see evidence of cultural understanding in their interactions with teachers. Overall, African American parents were found to be unimpressed with the degree of cultural sensitivity among Caucasian teachers, particularly in relation to disability status.

Urban African American parents of children with moderate to severe emotional or cognitive disabilities struggled to feel supported in special education services (Zionts et al., 2003). The relationship of their identity to services provided was a perceived cause.

The authors (Zionts et al., 2003) made concessions about the potential bias of respondents from parent organizations but chose them based on their representation of the community. Furthermore, no compensation was given to parents for their participation in the study. Though, Zionts et al. referred to parents, the significance was never clear. However, Zionts et al. were careful not to generalize their conclusions from the parents to a wider audience. Their intention for this study was to be an initial view of African American parents' perspectives on culture and disability in urban schools.

While adults, including teachers and parents, were influential in students' lives, so were their peers. Swaim and Morgan (2001) investigated the attitudes and behavioral intentions of typically developing peers toward a peer in a video with and without autistic behaviors and with or without information about autism. Age and gender effects of peers were evaluated.

Two hundred thirty-three students participated in this study. Of the total participants, 116 were boys and 117 were girls. They were 93.6% white and 6.4% black. In addition, 112 were third graders and 121 were sixth graders, all enrolled in general education classrooms in two neighboring schools. The schools were located in a mostly

middle-class suburb in a large metropolitan area. The participants were selected based on their lack of knowledge of autism.

The participants were randomly assigned with their grade to one of three conditions, no autism ($n = 78$), autism ($n = 77$), or autism with information ($n = 78$). The study involved watching a video. The actor in the videos was a 12-year-old boy without autism but who had a sibling with autism. For the no autism video, he depicted a typically developing peer playing with a puzzle. For the autism video and autism with information video, he imitated his brother with autism. To ensure his portrayal of a child with autism, four professionals reviewed the video and all agreed that the boy's behaviors were accurate.

The students watching the videos completed a packet that included checklists and questionnaires. The first item in the packet was an Adjective Checklist containing half positive and half negative adjectives. Students marked all the adjectives that they believed applied to the boy in the video. The students who watched the videos also completed questionnaires that evaluated their assessment of how similar they felt the boy in the video was to the students in their classrooms and their willingness to engage in activities (General Social, Academic, and Active Recreational) with another student with a disability.

The Adjective Checklist revealed significant effects for autism (Swaim & Morgan, 2001). Participants in the third grade ($M = 28.95$) rated the boy in the video more favorably than students in the sixth grade ($M = 26.73$). All children rated the boy in the no autism condition ($M = 31.55$) more favorably than in either the autism ($M = 26.74$)

or autism with information ($M = 25.08$) conditions. The third graders rated the boy as more favorable than did the sixth graders.

On the Similarity Rating Form, students in the no autism condition ($M = 2.71$) rated the boy in the video as more similar to students in their classrooms compared with the participants in the autism ($M = 2.16$) and autism with information ($M = 2.24$) conditions (Swaim & Morgan, 2001).

The Shared Activity Questionnaire showed no significant differences in activity preference (Swaim & Morgan, 2001). As the whole, girls and sixth graders were more likely to view the boy in the no autism condition higher than the boy in the autism or autism with information conditions.

Overall, the results of the study suggested that younger, male, elementary students would be the most willing to engage in activities with students with autism, although all would be willing (Swaim & Morgan, 2001). Participants were less sure about their peers' responses to students with autism than their own willingness.

Results should be taken in light of the pencil-and-paper nature of these measures. Actual behaviors were not measured in this study. Though there were no pre- or post-tests, there were control groups. The verification of random distribution further validated the results. Swaim and Morgan (2001) were clear to state that their findings should not be generalized beyond typically developing peers age 8 to 12 who were predominantly white and middle-class. Given their cautious descriptions and procedures, the conclusions can be viewed with validity.

The opinions and perceptions of adults and peers were found to impact students with autism and their education. Teachers affected the social status of children with

autism as did they affect parents' perceptions. Race and child's diagnosis both impacted the way parents perceived interactions and what was best for their child. In addition, peers impacted the social status of classmates with autism. Autistic behaviors were a challenge for teachers, parents, and peers, but they did not uniformly exclude students from inclusion.

Acquisition of Academic Skills

Academic skill is one area of deficit for some individuals with autism. Many creative elements lie within the academic realm of elementary school in addition to general acquisition of other academic skills. The following studies assessed the narrative and storytelling abilities ability (Bellon, Ogletree, & Harn, 2000; Craig & Baron-Cohen, 2000; Losh & Capps, 2003) of students with autism or examined whole class classroom (Dugan et al., 1995; Kamps, Barbeta, Leonard, and Delquadri, 1994; Kamps, Leonard, Potucek, & Garrison-Harrell, 1995) and one-on-one strategies (Koegel, Koegel, Frea, & Green-Hopkins, 2003; Polychronis, McDonnell, Johnson, Riesen, & Jameson, 2004) to teach such students those and other academic skills.

Narrative and Storytelling Ability

Storytelling is a skill utilized in elementary school, be it from teachers or students. However, it involves imagination and creativity in conjunction with social elements. The following studies evaluated the ability of students with autism to engage in storytelling or narratives in a structured environment (Bellon et al., 2000; Craig & Baron-Cohen, 2000; Losh & Capps, 2003).

Craig and Baron-Cohen (2000) investigated the creation of imaginary- versus reality-based narratives, with and without cues, in students with autism spectrum

disorders. They asked the question of whether students with autism had the imaginative abilities of peers as demanded by storytelling in classrooms. They also compared imaginary- versus reality-based narratives in students with autism versus students with Asperger's Syndrome.

Four groups of students participated in the study (Craig & Baron-Cohen, 2000). The first group of students consisted of 13 students with autism, and the second group consisted of 14 students with Asperger's Syndrome. The mean age of the students for both groups was 12 years 9 months. Fifteen students with moderate learning difficulties comprised the third group with a mean age of 12 years and 4 months. All students in the first three groups attended special schools. The fourth group consisted of 14 typically developing students, all enrolled in a primary school, with a mean age of 5 years 3 months.

Groups were matched on multiple levels. The group with autism was matched according to verbal mental age with the group with moderate learning difficulties and chronological age with those diagnosed with Asperger's Syndrome. The other groups served as non-autistic controls in the study.

The pre-test assessed event recall, telling a story about the previous day (Craig & Baron-Cohen, 2000). The pre-test provided baseline data on narrative length, fluency, and verbal cohesiveness. There were no time restrictions, although there were probes if the student paused. No significant effects were found.

Afterwards, the students were assessed in two conditions. Condition 1 was to tell a story about a dragon, thereby drawing on imaginary elements, and Condition 2 was to

tell a story about a little girl or boy, thus elements of reality. For each condition, the length of the narrative was measured, as was the use of imaginary elements.

The testing sessions were audio taped and later transcribed. Two independent raters then scored the transcripts. Scoring centered on use of imaginary elements and narrative length.

During spontaneous narratives, there was a significant effect by group for use of imaginary elements ($p < .005$) (Craig & Baron-Cohen, 2000). The groups with autism and Asperger's Syndrome were less likely to use imaginary elements than either of the control groups. Only 13% of students with autism added any imaginary elements into Condition 1 with the dragon whereas 67% and 79% of the moderate learning difficulties and typically developing groups did so respectively. In addition, the target groups were significantly less likely to use imaginary elements in Condition 2 than peers, $p < .0001$. Only 15% of students with autism and 43% of those with Asperger's Syndrome actually introduced imaginary elements into their Condition 2 stories. This was compared to 73% of students with moderate learning difficulties and 79% of typically developing students.

The effect of group on the number of elements in each narrative was significant, $p < .05$ (Craig & Baron-Cohen, 2000). The students with autism used fewer elements than other peers. Inter-rater reliability for this section was 97.1%.

Overall, the students with autism were less likely to introduce imaginary elements into their imaginary- or reality-based narratives, and students with Asperger's Syndrome were only less likely to introduce the elements in the reality-based narrative (Craig & Baron-Cohen, 2000). Craig and Baron-Cohen concluded that it was possible to measure use of imaginative elements for students with autism spectrum disorders. Furthermore,

these students were more likely to be impaired in their narrative abilities than other students with moderate learning difficulties or typically developing peers.

The use of controls and a pre-test further validated results. Also, using a separate party transcribe the audiotapes reduced potential bias. Moreover, the authors did not generalize the results to groups beyond the diagnosis of autism, strengthening findings.

While the preceding study (Craig & Baron-Cohen, 2000) examined the storytelling ability of students with autism spectrum disorders, the succeeding study (Losh & Capps, 2003) focused specifically on students with high-functioning autism. This study examined the narrative ability of students with high-functioning autism or Asperger's Syndrome across two contexts, storybook and personal. They also investigated use of grammatical devices and emotional understanding in its relevance to unfolding plot for structured and open-ended narratives.

Twenty-eight children with high functioning autism or Asperger's Syndrome from age 8 to 14 comprised the study group. They were recruited through area hospitals and clinics. Typically developing children, to serve as a control, were recruited from local school and after school programs. The children were matched according to chronological age and verbal IQ.

For, the first story context, personal narratives, students participated in semi-structured storytelling built from a conversation. Prompts were only given during excessive pauses. The second context, storybook narratives, used a 24-page wordless picture book, *Frog, Where Are You?*, to guide the child. Again, prompts were given as necessary. The order of the personal and storybook narratives was random.

In addition, each context was videotaped and audio taped. The stories were then transcribed and coded for complexity and structure. Measures included length, frequency, and range of grammatical complexity, type and frequency of evaluation, and structure.

A final measure analyzed the relationship between social understanding and narrative ability. Students received 12 vignettes and 10 video clips of varying story types. The authors (Losh & Capps, 2003) evaluated the students' definitions and assignment of emotions. Reliability data was collected for 50% of the tasks, chosen randomly. Agreement for narrative measures was 90% and for emotional understanding was 95%.

No significant differences were found for any of the measures between the students with high-functioning autism and the students with Asperger's (Losh & Capps, 2003). Therefore, both groups were combined for future analyses.

Both groups performed similarly for length of narrative (Losh & Capps, 2003). They both told longer personal narratives than storybook narratives. Students with autism or Asperger's Syndrome used less complex syntax than typically developing students ($p = .07$) and had a limited range of complex syntactic devices for personal narratives as compared to the control group ($p < .001$). There were no significant differences for storybook narratives for either measure.

Students with autism were found to be less likely to use evaluation in their narratives (Losh & Capps, 2003). However, when they did, they used a comparable range of evaluative devices as the control group for storybook narratives ($p < .05$). Within the evaluations, the students with high-functioning autism or Asperger's

Syndrome were less likely to include causal explanations in either context ($p < .001$).

This was the case of both explanations of behavior and emotions.

Narrative structure was another measure. For storybook narratives, students with high-functioning autism or Asperger's Syndrome were found to be just as likely as the comparison group to establish and maintain the story's theme even though they used fewer story components (Losh & Capps, 2003). The targeted students needed more prompts for elaboration ($p < .005$) and were also more likely to include irrelevant or bizarre information in their narratives ($p < .05$).

Measures for emotional understanding also proved to be limited for the participants with high-functioning autism or Asperger's Syndrome (Losh & Capps, 2003). They were found to be less able to apply appropriate definitions to emotions ($p < .005$) or accurately label emotions ($p < .005$). Lastly, the ability of students with autism or Asperger's Syndrome to define a range of emotions was significantly correlated to the length of both the personal and storybook narratives ($r(26) = .45, p < .05$; $r(26) = .38, p < .05$).

Overall, the students with high-functioning autism or Asperger's Syndrome were comparable in performance to typically developing peers on some measures but not all (Losh & Capps, 2003). Narrative length was similar to typically developing peers with longer personal narratives. Conversely, the students with high-functioning autism or Asperger's Syndrome described fewer episodes in storybook contexts. Compared with typically developing peers, the target students were less able to define and label emotions, which was reflected in their narratives.

Though Losh and Capps (2003) did generalize the outcomes of this study, they were careful to only do so for students with similar functioning levels of autism and Asperger's Syndrome. The high reliability data and the use of a control group support the findings. Pre- and post-tests were not included in the study due, perhaps, to the nature of the conversation.

The following case study questioned narrative ability by evaluating the effectiveness of repeated storybook reading (RSR) with the support of adult scaffolding on a child with autism. Repeated storybook reading served as a medium of joint attention and turn taking while promoting skill acquisition. The authors (Bellon, Ogletree, & Harn, 2000) were particularly interested in the program's influence on the participant's spontaneous utterances.

The subject of the case study was a boy of 3 years 10 months diagnosed with high-functioning autism. He followed single step commands and acted on objects in a functional manner. His speech was usually unintelligible with echolalia. He was enrolled in a general education preschool and in speech-language therapy.

An ABA single-subject design was conducted for this study with A representing baseline phases and B representing an intervention phase. The independent variable in this study was adult scaffolding and the dependent variable was the child's spontaneous speech. The study took place over a 7-week period. Baseline consisted of four sessions prior to treatment and two sessions following treatment, all 45-minute sessions. During baseline, the clinician introduced the storybooks and asked *wh* questions. The treatment sessions, on the other hand, introduced adult scaffolding for eight sessions. Five

storybooks from either the Story Box series or by Eric Carle were used throughout treatment for two sessions each.

At the beginning of each session, the clinician, a graduate student in speech-language pathology, read the book aloud with manipulative objects available to compliment the story. The clinician used several scaffolding techniques such as the cloze procedure, canary choices, expansions, and constituent questions. A nationally certified speech-language pathologist not associated with the study monitored the scaffolding to ensure consistency and also to provide feedback.

All sessions were audio taped and transcribed verbatim (Bellon et al., 2000). To ensure validity, a second person transcribed 5 minutes of each session. Reliability ranged from 85% to 97%. Participant utterances were coded as spontaneous or echoic. Reliability for utterances was also coded for 5 minutes of each session for a range of 83% to 89%.

Bellon et al. (2000) concluded that the RSR program with scaffolding was an appropriate option for a student with high-functioning autism with at least some verbal abilities. During baseline, the student demonstrated significantly more echoic utterances (about 62%) than spontaneous (about 38%). With treatment, he displayed about 50% of each. This pattern continued throughout the final baseline. Repeated storybook reading was found to support spontaneous utterances in a student with autism.

Though multiple methods of data collection were not utilized, the authors (Bellon et al., 2000) did make an effort to enhance reliability through the use of two transcribers, an audio recording, and a nationally certified monitor. Repeated storybook reading might be a viable option for teachers, particularly with the high reliability data.

Narrative and storytelling skills in students with autism were limited in part due to their social nature. Even students with high-functioning autism were included in this generalization (Bellon et al., 2000; Craig & Baron-Cohen, 2000; Losh & Capps, 2003). Structured experiences, such as Repeated Storybook Reading (Bellon et al., 2000), were effective in developing narrative skills in students diagnosed with autism.

Whole Class Strategies

For students with autism enrolled in general education settings, cooperative-learning strategies were evaluated in their affect on academic success (Dugan et al., 1995; Kamps et al., 1994; Kamps, et al., 1995). Both reading and social studies instruction were evaluated in their benefits for students with autism and their typically developing peers.

Kamps et al. (1994) studied the effectiveness of classwide peer tutoring (CWPT) on the reading skills and social interaction of 3 students with high-functioning autism and their typically developing peers. Further measures evaluated the frequency and duration of social interactions with classwide peer tutoring. The authors chose the model based on its adaptability and its perceived benefit to most students. The study took place as part of the traditional reading program at the school.

The participants were 3 male students with high-functioning autism and their classmates in suburban elementary schools. There were 1 or 2 other students with behavior or learning disabilities in each classroom.

Mike was an 8-year-old student with Autism and had a full-scale IQ score of 101. Mike was enrolled in a first/second-grade split and performed at or above a second-grade

level. Though Mike used complete sentences, he often fell back to using rote phrases to communicate. He preferred to play alone during free time, hardly responding to peers.

Adam was an 8-year-old with a full-scale IQ of 71. He was enrolled in a second-grade classroom. He performed around grade level in reading but had difficulties with comprehension and task completion. While he displayed some social skills such as smiling and initiating play with friends and peers, he tended to play independently during free time.

Pete was a 9-year-old in a third-grade classroom. He performed at grade level for most tasks but had difficulty with transitions between tasks. Responses were often one or two words with little to no eye contact. He preferred independent play, and his interactions with peers were often negative.

All 3 target students and their classmates participated in the treatment, although data was collected on only the students with autism and 14 of their peers. Students with learning differences and average reading performance comprised the study group with 4 or 5 peers from each classroom. The study took place in the general education classroom with the teacher and the experimenters as peer tutoring monitors. The experimenters alone measured academic and social performance.

The researchers used a multiple baseline design with a reversal, alternating treatment and non-treatment phases. Baseline consisted of teacher led reading instruction with basal readers, though instruction varied moderately from teacher to teacher.

All students were trained in peer tutoring. Following each CWPT session, students independently read the day's passage for a 2-minute timed reading. The experimenter recorded the number of words read correctly and errors per minute without

giving feedback. The experimenter then asked five comprehension questions and recorded accuracy. Unstructured free time play with stations followed the timed reading. Data was collected using the Social Interaction Code using 5-minute random sampling on a laptop for play initiation, response, and duration.

An independent observer collected reliability data on the dependent measures of the 2-minute timed reading and free play (Kamps et al., 1994). Interobserver agreement was taken for 37% of the timed readings for a mean agreement of 99.5% across conditions and 96.1% for reading comprehension. Agreement for errors per minute was 83.9%. For unstructured free play, data was collected for 41% of sessions for interobserver agreement of 91.5% for frequency, 90.6% for duration, and 85.7% for mean length of interaction.

Classwide peer tutoring proved to be both effective and efficient for gains in reading and social skills (Kamps et al., 1994). It generated an increase in the reading fluency of all 3 students with autism as well as the majority of their peers with and without learning disabilities. Mike, Adam, and Pete all increased their rates respectively by 19, 31, and 12 words per minute. Upon the reversal, the mean reading rates for both Adam and Pete dropped while Mike's stayed the same. When the treatment was reinstated, the reading rates for all three again improved.

The mean number of errors varied for the target students (Kamps et al., 1994). Mike demonstrated a decrease in errors during the first treatment phase, which stayed consistent throughout the rest of the study. Both Adam and Pete were consistent with three and two errors respectively throughout the study.

Mike, Adam, and Pete all increased their comprehension scores during treatment with a drop during reversal for the first two participants (Kamps et al., 1994). Mike, Adam, and Pete began with correct comprehension responses for 47%, 24%, and 67% respectively. During the first treatment phase with the peer tutoring, they increased to 76%, 68%, and 90% correct response. Both Mike and Adam dropped to 50% during reversal while Pete continued at 93%. They all increased during the final treatment phase to 85%, 85%, and 100% correct response respectively.

Social interaction appeared to be influenced by the introduction of the peer tutoring strategy (Kamps et al., 1994). All 3 targeted students displayed an increase in social interaction time during the peer tutoring. Duration means per 5-minute sample were 50 seconds, 40 seconds, and 25 seconds for Mike, Adam, and Pete respectively. During the first classwide peer tutoring treatment, the time increased to 144 seconds, 120 seconds, and 145 seconds respectively. During the reversal, all three students' interaction duration dropped to near initial duration. The final peer tutoring demonstrated an increase for Mike to 203 seconds, Adam to 157 seconds, and Pete to 138 seconds. The mean social interaction time was similar for most peers as well.

The length of interactions for Mike, Adam, and Pete increase from the initial baseline to the first treatment by 48 seconds, 17 seconds, and 23 seconds respectively (Kamps et al., 1994). During the reversal, all 3 participants decreased by 42 seconds, 17 seconds, and 31 seconds with a subsequent increase of 65 seconds, 33 seconds, and 17 seconds with the reintroduction of peer tutoring. Peers again displayed a similar pattern.

All targeted students increased in their academic scores and in peer interactions (Kamps et al., 1994). Given that students with and without autism enjoyed and benefited

from peer tutoring, Kamps et al. concluded that peer tutoring would be beneficial in a general education classroom.

Though there was a potential for confounding variables such as teacher prompting, Kamps et al. (1994) conceded that possibility and gave suggestions for future research. The authors generalized the findings to students with autism and their peers but offered that results might differ with lower-functioning students with autism. The concessions and high interobserver agreement further supported the findings.

There were various types of cooperative learning that could be successfully employed in reading instruction for students with autism spectrum disorders. The previous study (Kamps et al., 1994) focused on peer tutoring while the next (Kamps et al., 1995) investigated cooperative learning groups.

With increased inclusion of students with disabilities in the general education classroom, the following study was concerned with effective instructional methods for including and supporting all students (Kamps et al., 1995). The purpose was to examine the effects of cooperative learning groups (CLGs) for students with autism and other disabilities as well as their typically developing peers. This study attempted to answer whether or not students with autism could successfully engage in cooperative learning groups, what academic learning and engagement occurred for such students, and what levels of interaction with peers occurred. Kamps et al. performed two investigations, one in a third-grade classroom and one in a fifth-grade classroom.

The first investigation included 1 student with autism and 15 third grade peers, 6 of who had some sort of learning or behavior disability. All students attended a small,

suburban elementary school with low- to middle-income levels. The general education classroom where the study took place had one teacher and one paraprofessional.

The target student was Mike, an 8-year-old with high-functioning autism and an IQ of 101. He completed grade level work and had been integrated in the general education classroom since first grade with support in reading comprehension in a resource room and in speech. Mike's social interaction and spontaneous use of language was limited.

Dependent measures included pre- and post-test weekly quizzes, academic engagement, and student interaction data. The quizzes contained comprehension, vocabulary, and sequencing of reading passages. Academic engagement was measured using the Code for Instructional Structure (CISSAR) on 10-second time sampling intervals. The specific measures were active academic engagement, attention to task, and other nonacademic behaviors. The MOOSES code measured student interaction for frequency, total duration, and mean length of interactions.

Kamps et al. (1995) used a reversal design for this study meaning that data was collected prior to treatment and during treatment, a withdrawal of treatment, and a second intervention. During baseline, additional materials included worksheets on vocabulary and mapping where as during intervention, materials included flashcards, comprehension sheets, and game cards.

The reversal design began with a baseline phase of 3 weeks for 1 1/2 hour sessions. The teacher led whole-class instruction that included lecture, discussion, and paired work. For cooperative learning groups, students were organized in groups of four with assigned and rotating roles. During the 30-minute CLG block, the students had

three tasks to complete such as peer tutoring on vocabulary, practice with *who* questions, and academic games. Following, was the withdrawal to baseline for 3 weeks and an 8-week final intervention phase with 10 minutes of direct social skills instruction prior to reading.

An independent observer recorded reliability data for each student on all dependent measures (Kamps et al., 1995). Agreement for the quizzes was 99% with a range of 85%-100% for all students, including Mike. Agreement for academic engagement was 87%, for attention 74%, and for other behaviors 74%, which were low due to the infrequency of behaviors. Reliability data was collected for 40% of the observations of Mike. Peer interaction agreement was 89% for Mike. Duration averaged 87% for Mike.

Kamps et al. (1995) claimed the academic effectiveness of CLGs as an addition to teacher-led instruction. They believed that it was a successful strategy to increase appropriate interaction during reading instruction. During baseline, Mike averaged gains of two to six items in weekly quizzes and increased to means of 7.8 and 8.7 during the two interventions. Academic engagement also increased during cooperative learning groups. Mike rose from an average of 28%-30% engaged during baseline to 61%-74% during treatment.

Mike also demonstrated increases in student interaction with the introduction of cooperative learning groups (Kamps et al., 1995). Probes were 5 minutes (300 seconds) and collected across conditions. Mike averaged 25 seconds and 0 seconds of student interaction during baseline and averaged 229 and 255 seconds during CLGs. The frequency of interactions changed little, but the length of interaction was significant.

Mike demonstrated a mean length of interaction of 0 to 7 seconds during baseline to 85 to 178 seconds for intervention.

The second investigation was set in a fifth-grade classroom in a small, urban, inner-city elementary school. The participants were 2 students with autism and 24 peers, half of who received Chapter 1 reading support. The general education teacher, special education teacher, and Chapter 1 reading teacher all supervised the study.

Ann, diagnosed with autism, was a 13-year-old female with moderate levels of functioning. Her overall IQ was 50, and she was able to read and write, although she had difficulty with reading comprehension. Ann's language skills were functional, and she was generally on task. She was interested in her peers, saying hello to them several times and smiling.

Carla was a 12-year-old female with a full IQ between 42 and 55. She functioned at lower levels, but she could read at the primary level. Language and written comprehension was difficult, and she was often echolalic. She could make spontaneous requests and respond to questions when she was on task.

The same measures and procedures as in the first investigation were used for this second one as well. The measures were quizzes, academic engagement, and student interaction.

Materials were teacher selected as in the first investigation with an emphasis on whole language. The same reversal design was used with variation on time frames. Baseline was 2 weeks followed by 9 weeks of CLGs, 2 weeks of withdrawal, and a final 5 weeks with CLGs. This time the final cooperative learning group condition did not have social skills direct instruction, though the experimenter did present the key social

behaviors necessary for success at the beginning of the first intervention. Ann and Carla had independent tasks as opposed to listening to the teacher lecture and discussion based on their use of separate basal readers.

Reliability data, as conducted in the first investigation, was high (Kamps et al., 1995). Agreement for the quizzes averaged 96% for both Ann and Carla. For engagement, reliability averaged 87%, 60% for attention, and 62% for other behaviors due to low incidences of behaviors. Reliability for Ann and Carla for peer interaction averaged 93% and 92% respectively. Agreement for duration was 73% and 80% respectively.

The second investigation also demonstrated the academic effectiveness of cooperative learning groups as a supplement to teacher-led instruction (Kamps et al., 1995). Quiz gains were variable for Ann and Carla. With limited engagement during baseline, both Ann and Carla increased to 50% and 36% respectively and maintained engagement at 52% and 45% during individual tasks (Kamps et al., 1995). During the final intervention, they maintained engagement 70% and 55% of the time respectively.

All students interacted with peers more during CLGs than during baseline (Kamps et al., 1995). Anne averaged 5 to 12 seconds during baseline and 177 to 217 seconds during cooperative learning groups (Kamps et al., 1995). Similarly, Carla averaged 0 to 49 seconds during baseline and rose to 133 to 174 seconds during groups.

Overall, data revealed positive results for Mike, Ann, and Carla for academic engagement and peer interaction (Kamps et al., 1995). This was the case for students with and without autism. The social skills training in the first investigation did have a positive influence. In addition, some of the autistic tendencies of Ann and Carla were

reduced. In spite of the variation in experiments, the data suggested that in structured cooperative learning settings, students with autism were able to successfully participate in academic work and interact with peers.

Over the two investigations, Kamps et al. (1995) found cooperative learning groups to be effective for engaging students with disabilities in academic instruction. The high agreement for both investigations added strength to the findings. Though Kamps et al. claimed the effectiveness of cooperative learning groups for students with disabilities, the participants included only students with autism, the primary targets, and students with learning or behavioral disorders. This claim might overstep its bounds, though the results of the investigations appeared to support students with autism.

While the previous two studies demonstrated the success of students with autism in cooperative learning situations, they both focused on reading instruction (Kamps et al., 1994; Kamps et al. 1995). The following study (Dugan et al., 1995) addressed another content area of elementary school, social studies.

Cooperative learning groups in social studies was of interest for Dugan et al. (1995). They studied the effects of the groups on instruction and integration of 2 students with autism and 16 fourth-grade peers. They investigated whether or not students with autism could successfully participate in cooperative learning groups. Specifically, they studied academic performance and engagement as well as social and behavioral skills.

Ann, the first target student was 10 years old and functioned at a moderate level. She completed assignments at second- and third-grade levels. Her weaknesses included comprehension and abstract concepts.

Matt was 9 years old and diagnosed with high-functioning autism. He used second- and third- grade curriculum as well and also lacked in comprehension and abstract reasoning. He was withdrawn and shy and depended on rituals and schedules.

The study took place in the general education classroom with teacher monitoring. The paraprofessional provided assistance and conducted the pre- and post-tests. One or two experimenters were present to monitor the program.

Dugan et al. (1995) used a reversal design, as in the previous study, to evaluate academic performance, academic engagement, peer interactions, and social and behavioral skills of all students. During baseline, students sat in assigned groups and responded to teacher lectures. In the 3-week intervention phase, students were trained in cooperative learning group process and were assigned to heterogeneous groups of four with assigned roles that rotated among students. The intervention consisted of a 10-minute whole-class lecture followed by cooperative activities such as peer tutoring and team worksheets. The session ended with a 5-minute whole-class wrap-up. A two-week return to baseline followed intervention. The cooperative groups were then reintroduced for a final phase.

Data was collected on weekly pre- and post-tests on the social studies content, academic engagement for two 10-minute intervals during each session, and 5-minute probes for interaction. The tests were modified to fit the academic skills of the students with autism.

Several coding measures were used throughout the study. Dugan et al. (1995) performed academic engagement probes using 10-second momentary time sampling with

the Code for Instructional Structure (CISSAR). Student interaction was coded for initiations, responses, and length of interactions using the Social Interaction Code (SIC).

Due to the multiple pieces of data collected, reliability data was also collected for a number of measures (Dugan et al., 1995). Reliability for most data ranged from 70% to 100% but lingered around 90%. Engagement probes were sometimes lower, but the authors attributed that to the limited occurrence of behaviors during some sessions.

Overall, cooperative learning groups demonstrated increases in scores and academic engagement (Dugan et al., 1995). During intervention, Ann and Matt earned higher quiz scores ($M = 5$ to 8.6) than for baseline ($M = 0$ to 2). Significant gains were also found for engagement. Active engagement during baseline ranged 2% to 25% during baseline and 1% to 17% during mini-lectures. During cooperative groups, engagement increased to 72% to 90%. In addition, attention such as listening was higher during baseline ($M = 19\%$ to 59%) than during intervention ($M = 0\%$ to 10%). Criterion was not met for all engagement probes.

Student interactions significantly increased from baseline to intervention during the 5-minute probes (Dugan et al., 1995). Ann demonstrated 0 to 1.25 seconds of interaction during baseline and an average of 191 and 273 seconds during cooperative groups respectively. Matt increased from 17 to 28 seconds of interaction during baseline to 219 and 220 seconds during intervention.

Dugan et al. (1995) concluded that cooperative learning groups were effective not only for the target students with autism but also for their peers. Both Ann and Matt developed their social studies vocabulary though comprehension was still a challenge. Furthermore, active academic engagement was high for cooperative groups. In essence,

cooperative learning groups positively effected the academic engagement and social interaction of students with autism.

Dugan et al. (1995) were clear that because of the low reliability of the results, they should be considered in generalizing this study to other students with autism. The study took place with unmodified curriculum, adding a potential variable. Consideration, though cautious, should be given to the findings based on their consistency with other cited literature.

Cooperative learning methods for instruction benefited both students with and without autism spectrum disorders (Dugan et al., 1995; Kamps et al., 1994; Kamps, et al., 1995). Not only did the academic engagement increase for students with autism but also did their peer interaction. This was the case in both reading and social studies instruction.

One-on-One Strategies

At times, whole class strategies such as cooperative learning can or need to be supplemented by one-on-one strategies for students with autism spectrum disorders. The following are two studies, one that was performed in class (Polychronis et al., 2004) and one at home (Koegel et al., 2003), that met the individual needs of students with autism.

Polychronis et al. (2004) compared the effectiveness of two trial distribution schedules of embedded instruction on the acquisition of basic skills for 4 students with developmental disabilities including 2 with autism. Each student had two sets of basic skills to master. Instruction trials were disseminated over a 30-minute schedule or a 120-minute schedule to determine which, if either, was more effective.

The participants were enrolled in two neighborhood elementary schools in an urban school district in Utah. The first participant, Steve, was 11 years old and in the fifth grade. He had mild to moderate levels of autism. His communication skills were good and he was able to participate in class lectures and activities with some modifications. Steve was in the general education classroom the majority of the day with the remaining time in a self-contained classroom. His targeted subjects in this study were geography, language arts, and math.

Andrew, the other student with autism, was at a similar cognitive level to Steve. Though he was in the second grade, his age equivalent was 3 years and 6 months. He had good receptive communication skills and participated in classroom activities with some modifications. Andrew spent much of each day in the general education classroom with the remaining time in a self-contained classroom. His targeted subjects were math, reading, and language arts.

The students were taught basic skills associated with their grade level. Steve's targeted skill was to verbally state the capitals of 20 states. Andrew was taught to tell time at 15 and 30 minutes past the hour. There were separate lists for both the 30- and the 120-minute distribution schedules. The dependent measures were the percentage of correct answers and the total number of trials to meet criterion. The teachers conducted weekly test probes for each student.

Polychronis et al. (2004) adapted an alternative treatment design for this study. Baseline consisted of three test probes for both the 30-minute and 120-minute instructional set. Steve and Andrew got almost all, if not all, responses incorrect.

The intervention phase consisted of alternating 30-minute and 120-minute scripted embedded instruction each day. Embedded instruction was presented during geography for Steve and math for Andrew. The instructional set was presented three times during each session and was not consecutive.

Accountability data was collected for each teacher. Polychronis et al. (2004) collected fidelity data for 28% of the instructional sessions for a mean of 96% and a range of 92%-100%. Interobserver agreement was gathered for 74% of the testing probes for 100% agreement for all observations.

Both Steve and Andrew acquired their targeted skills through embedded instruction for the 30-minute and the 120-minute distribution schedules (Polychronis et al., 2004). Rates of acquisition were similar for both distribution schedules. Steve took 18 instructional trials with an average of three sets under each distribution schedule to correctly identify the capitals of 20 states. Andrew used 20 instructional trials with an average of four trials per session.

Polychronis et al. (2004) claimed embedded instruction as a useful strategy for students with developmental disabilities in general education classroom. The researchers made no claims about the effectiveness of one distribution schedule over the other. Given the limited number of participants and diagnoses, this generalization seemed unfounded. However, the effectiveness of the strategy for students with autism could be feasible.

While strategies in the classroom may be effective for students with autism, support from home could enhance student learning and magnify that success. Koegel et al. (2003) examined the effect of previewing, here on referred to as “priming,” classroom

assignments on academic responding and problem behavior. This was an attempt to increase motivation and skills acquisition.

Two students participated in this study, 1 in elementary school and 1 in high school. Both students were diagnosed with autism and were selected by school personnel based on their disruption in the general education classrooms. Teachers reported that they were unable to properly conduct lessons due to the behaviors. For the purposes of this review, only the individual in elementary school will be reported upon.

The elementary student was 5 years and 6 months. He was fully included in a preschool and kindergarten classroom and received speech and language services. His IQ was 4 months behind his age. The targeted inappropriate behaviors in his IEP included screaming words and laughing out of context, lying and rolling on the floor, knocking papers off his desk, and running around the classroom. These were observed at a rate of 2 per minute during the school day. He also requested using the bathroom to avoid work.

All data was collected in the general education classrooms, though priming occurred in the evenings at home. Observation sessions were selected based on the times when the student was most disruptive. Data for academic response was collected during desk time in the preschool classroom, and data for disruptive behavior was collected during kindergarten activity time.

The speech-language pathologist designed the intervention based on a manual. The parent picked up the priming materials each day and returned them the next morning, recording use or no use. While the length of the priming session was up to the primer, they generally lasted about an hour. The parent was uninformed of the purposes of the study. The priming tasks included recognition, writing, and phonics for each letter of the

alphabet for preschool and stacking blocks, stringing beads, and making patterns in kindergarten.

Data was collected on occurrence of appropriate behavior and academic response. For each 10 to 15 minute session, data was collected on a 10-second observation and 5-second recording schedule.

For 16 of the sessions, eight for each dependent measure, reliability data was collected (Koegel et al., 2003). Inter-rater agreement was 90% for appropriate behavior with a range of 83% to 100% and agreement was 81% for academic response with a range of 81% to 88%. Agreement for appropriate behavior was stronger than for academic response.

Priming was found to be beneficial for both correct academic response and appropriate behavior (Koegel et al., 2003). In sessions without priming, the elementary student averaged 35% appropriate behavior (range 0% to 61%), but for sessions with priming, he averaged 83% appropriate behavior (range 72%-100%). In addition, he averaged 30% (range 0%-50%) for correct academic response for class sessions without priming. In contrast, in sessions with priming, he averaged 70% correct academic response (range 60%-75%). The effect sizes were very significant.

Such high results indicated the positive effect of priming for this student with autism (Koegel et al., 2003). The problem behaviors decreased dramatically and the correct academic response increased. Priming, Koegel noted, by nature provided reinforcement and increased task completion, enhancing student confidence.

Since the parent was not informed of the study's purposes, parental bias was reduced thereby legitimizing the findings. Koegel et al. (2003) did not directly generalize

to other individuals or groups, but the authors did note the possibilities and positive nature associated with these results. The findings may support students with autism spectrum disorders.

One-on-one strategies were found to support the academic success of students with autism (Koegel et al., 2003; Polychronis et al., 2004). Be it at home or at school, strategies from multiple angles are important. Explicit practice on targeted basic skills could advance students to a desired level. These strategies would not work for all skills, but they would provide support for some. In addition, priming students for the following day supported academic success as well as the need for routine (Koegel et al., 2003).

In summary, some students with autism do have academic or cognitive deficits. One of those areas was narrative and storytelling ability (Bellon et al., 2000; Craig & Baron-Cohen, 2000; Losh & Capps, 2003). Different strategies were useful in supporting students with autism in this and other academic areas. Both whole class and one-on-one strategies supported the acquisition of academic skills for students with autism. The cooperative learning strategies proved successful across reading and social studies curriculum for students with autism as well as their typically developing peers and peers with disabilities (Dugan et al., 1995; Kamps et al., 1994; Kamps, et al., 1995). One-on-one strategies would provide additional support for students (Koegel et al., 2003; Polychronis et al., 2004). Support on a variety of levels would benefit students with autism spectrum disorders in the general education classroom.

Academic Engagement

Academic engagement for students with autism can be a challenge for general education teachers. Teachers can make changes in their grouping (Bryan & Gast, 2000;

Logan, Bakeman, & Keefe, 2006), change their location in the room (Conroy, Asmus, Ladwig, Sellers, & Valcante, 2004; Young & Simpson, 1997), and address the underlying needs of students with autism (Charlop-Christy & Haymes, 1998; Schilling & Schwartz, 2004).

Instructional Strategies

Classwide strategies often benefit all students in the class, those with disabilities and those without. Changing the size of groupings for instruction as in the subsequent study (Logan et al., 2006) and providing students with task schedules as in the later study (Bryan & Gast, 2000) are two systems that had an effect on the academic engagement of students with disabilities.

Logan et al. (2006) investigated the effects of instructional variables on the active engaged behavior of 29 kindergarten through fifth-grade students with moderate, severe, or profound intellectual disabilities who were included full time in general education classrooms. Engagement was measured in relation to instructional group size as well as teacher focus.

The students' intellectual disabilities included mild to severe autism among other unidentified diagnoses compounded by other disabilities or impairments. Ten of these students were included upon parental request, and teachers and the first author recommended the remaining 19.

Of the grade levels, nine classrooms were kindergarten, four were first grades, three were second grades, five were third grades, four were fourth grades, and five were fifth grades. Six special education teachers and six special education paraprofessionals served the classrooms. Additionally, some students had para-professionals as support in

the general education classroom. The study took place in 4 large, suburban elementary schools near Atlanta, Georgia.

Logan et al. (2006) used the observational data system, Mainstream Version of the Code for Instructional Structure and Student Academic Response (MS-CISSAR) with momentary time sampling, for this study. The rapidly changing variables recorded were instructional group, teacher definition (general education teacher, special education teacher, or special education paraprofessional), teacher focus, and student response. Other changing variables were recorded every 90 seconds as opposed to every 15 seconds for the others.

The observations of the students were conducted over several days for 60-120 minute blocks with one observation per day. Additionally, for 24% of the observations, agreement sessions were completed to check for reliability, with 94% reliability overall (Logan et al., 2006).

Logan et al. (2006) found that active engaged behavior in students with disabilities occurred 36% of time. Particular instructional groupings supported student engagement better than others. One-to-one and small group instruction proved superior to whole class instruction for students with moderate, severe, and profound disabilities at a rate of 42% and 43% engagement respectively, compared to 23% engagement for whole class instruction.

As students' required focus on the instructor changed, so did the engagement of the students with disabilities (Logan et al., 2006). For whole class, small group, and independent work, teacher focus on a targeted student increased his or her engagement.

In whole class instruction, observers reported 35% active engagement when the teacher focused on the targeted students, a 12% to 15% increase over other conditions.

Students with disabilities were engaged 46% of the time when they were the focus of the attention in one-to-one instruction. Students with moderate, severe, and profound disabilities were engaged 53% of the time when the teacher was focused on them in small group instruction, a 17% to 20 % increase over other conditions.

In summary, Logan et al. (2006) found three instructional contexts that provided the highest active engagement for students with moderate, severe, and profound disabilities. They were one-to-one instruction with a focus on the target student, small group instruction focused on the target student, and independent work regardless of the teacher focus. However, independent work was infrequently observed. All averaged 49% active engagement for the target students.

A stated effort through seeking recommendations was made to ensure a representative sampling of the county school system though the specific methods were not described (Logan et al., 2006). The discussion did mention that the group was fairly heterogeneous and further studies should be conducted. Furthermore, Logan et al., did not evaluate the quality of the engagement. This study had limitations, but the findings could still, in part, support students with disabilities due to the congruence of the findings to other research.

Given that whole class instruction resulted in limited academic engagement for students with disabilities (Logan et al., 2006), strategies that support smaller groups would be necessary. The following study (Bryan & Gast, 2000) addressed a strategy for group work and literacy centers. Many challenges and changes in routine in educational

settings affect students with autism (Bryan & Gast, 2000). This study was an extension of prior research with different age groups and functioning levels. The two components investigated were the effectiveness of a visual activity schedule in teaching students with autism to independently engage in on-task and on-schedule behaviors and to generalize those behaviors to novel activities.

The participants were 4 students with autism, ranging in age from 7 years 4 months to 8 years 11 months. They were enrolled halftime in a general education classroom and halftime in a resource room for students with autism spectrum disorders. Students functioned at grade level or no more than a year below in reading. The students were selected because they depended on verbal prompting and teacher supervision.

Allen was 8 years and 11 months and in second grade. His age equivalent was 6 years 2 months, and he scored 90 for reading on the Weschsler Individual Achievement Test. His pull-out services included language arts and speech therapy.

Tim was exactly 8 years and in first grade. His age equivalent was 6 years 10 months and scored a 94 on the Weschsler Test. Likewise, he received language arts and speech pull-out services.

Jack, at 7 years 4 months, was also in first grade. He had an equivalent age of 5 years 4 months and scored 87/82 on the Weschsler Test. He received language arts, math, occupational therapy, and speech therapy pull-out services.

Jenny, the only female, was 8 years and 6 months. She was in first grade and had an age equivalency of 5 years and 2 months. Her score on the Weschsler Test was 110/87. Her pull-out services included language arts, math, occupational therapy, and speech therapy similar to Jack.

The study took place in the resource room during language arts, a 45-minute block. The centers in the room were writing, reading, listening, and art. The picture activity schedules were small, plastic photo albums with four pictures of academic activities. The special education teacher acted as the experimenter and the two paraprofessionals collected data.

The dependent variables were on- and off-schedule, on-task with scheduled or unscheduled materials, and off-task. A 1-minute momentary time recording was used to record on- and off-task behaviors while a 1-minute continuous interval recording was used to tally adult prompts to maintain student engagement.

The session began when the teacher gave the general announcement for literacy center time. The teacher then gave specific task instructions to each student and sent him or her to the task. In addition, statements of praise from the teacher were set on a three-minute interval schedule.

The phases of the study were a generalization pretest, instruction with no activity schedule book (baseline), graduated guidance to teach the book, book only (independent variable), no book, book only, and a generalization post-test. For the pre- and post-test, the picture books were available but no direction was given for their use in the activity. No direction was given during the baseline after work began and no further prompting was provided during the book only conditions.

Reliability data was collected by the paraprofessionals at least once every 5 days. For child performance and procedural reliability, mean agreement was 100%, (Bryan & Gast, 2000).

Procedures were found effective for all participants with autism (Bryan & Gast, 2000). The introduction of the picture activity books dramatically increased on-schedule behavior. No student was on schedule more than 27% of the time during the no activity schedule book conditions, whereas most hovered or stabilized around 100% with a low of 91.3% during intervention.

On-task data was similar to on-schedule data with its dramatic increases (Bryan & Gast, 2000). On-task ranged in mean from almost non-existent to 60.3% during the no activity schedule book conditions. On the other hand, most participants stabilized close to 100% for graduated guidance and book only conditions with a low of 95.6%

Lastly, during the generalization pre-test, on-schedule behaviors were 3.3-21.5% whereas performance was 100% for the post-test for all students (Bryan & Gast, 2000). Similarly, performance for on-task behavior ranged from 5%-31.5% on the pre-test. Performance was 100% for Allen, Tim, and Jack and 99.5% for Jenny on the post-test. The pre- and post-tests with novel activities demonstrated the effectiveness of this strategy in multiple scenarios (Bryan & Gast, 2000).

Though there was not a control group in this study, it was a systematic replication of prior research with younger participants (Bryan & Gast, 2000). The alternation of treatment and non-treatment allowed for a form of control. The use of pre- and post-tests strengthened the findings, as did the high reliability data. The findings demonstrated a clear positive result from the picture activity schedules.

If students are to work without the direct and intense supervision of a teacher, they need to have a system for progression and accountability. Logan et al. (1997) claimed students with disabilities were less engaged during whole class instruction. To

complement this finding, Bryan and Gast (2000) found that students were not productive during literacy centers without task schedules. Instruction in smaller groups benefited the academic engagement of students with autism (Logan et al., 1997) as did picture activity schedules (Bryan & Gast, 2000).

Adult Proximity

The presence of adult proximity was a factor for consideration in the academic engagement of students with autism (Conroy et al., 2004; Young & Simpson, 1997). The adult, the teacher or a paraprofessional, could use his or her location in the room to encourage students to engage in on-task behavior. A secondary factor was the use of prompting in conjunction with proximity. Together, proximity and prompting had varying effects.

Conroy et al. (2004) studied the descriptive effects of adult proximity on the behaviors of 6 students diagnosed with autism spectrum disorders enrolled in general education settings. In addition, they questioned the effect of adult directives on student behaviors. Specifically, they addressed academic engagement and challenging behaviors through direct observation with the teachers uninformed of the exact purposes of the study.

The 6 participants in this study were selected based on a diagnosis of autism or autism spectrum disorder, enrollment in a general education classroom for at least 50% of the day, engagement in disruptive behaviors, and being between the ages of 5 and 8. The study took place in six classrooms in six separate elementary schools in a suburban school district.

Josh was a 6-year-old first grader. He was diagnosed with autism spectrum disorder (ASD) and had an IQ of 78. Josh's problem behaviors included disruption, inappropriate vocalizations, off-task behavior, and stereotypy.

Mickey was also diagnosed with ASD. He was a 5-year-old kindergartner with an IQ of 100. Mickey's teacher reported the same problem behaviors of disruption, inappropriate vocalizations, off-task behavior, and stereotypy.

Derek, a 6-year-old first grader with an IQ of 77, also shared the same problem behaviors as the previous 2 participants. He was diagnosed with autism with the addition of a language impairment.

Rachael, the only female, was 5 years old and in kindergarten. Likewise, she was diagnosed with autism. Her IQ was 110, and her problem behaviors included disruptive and off-task behaviors during most academic activities.

Charles, a 7-year-old, had several diagnoses including Pervasive Developmental Disorder, Attention Deficit/Hyperactivity Disorder, Obsessive Compulsive Disorder, and asocial disorder. He had an IQ of 110 and was in second grade. Charles was also disruptive and engaged in stereotypy and off-task behavior.

The final participant, William, a 5-year-old kindergartner, was diagnosed with autism and speech/language impairment. He had an IQ of 77. He had a one-on-one teacher's assistant but still engaged in disruptive and off-task behavior and stereotypy.

Observation days and times were determined according to the teachers' schedule. The students participated in small- and large-group activities during this time, and the activities varied from one classroom to another depending on curriculum and materials. Activities could be academic or nonacademic. During 5-week period, a mean of 20

sessions were conducted with 5 to 10 hours of observation per student. Each session was videotaped and later coded using the Multiple Option Observation System for Experimental Studies (MOOSES).

Mann-Whitney U-tests were used to calculate the rate of target behaviors for each student. Both engagement and problem behaviors were recorded. The independent variables were adult proximity and lack of adult proximity. Proximity was defined as the adult being within an arm's length from the target student for at least 3 seconds.

Interobserver agreement was collected prior to the first observation to ensure the validity of both the dependent and independent variables (Conroy et al., 2004). During the study, interobserver agreement was calculated for 29% to 40% of the observation sessions with a mean of 87% agreement on dependent measures and 97% agreement on independent measures.

Proximity of a teacher to the students with autism had varying affects (Conroy et al., 2004). For 3 of the 6 participants, Josh, Mickey, and Derek, the absence of an adult was equated with increased problem behaviors. For the remaining 3 participants, Rachael, Charles, and William, adult proximity had no affect on their behaviors.

While the challenging behaviors may still have existed, adult proximity did seem to affect the rate of engagement for all students except Josh for whom proximity had no effect (Conroy et al., 2004). Proximity was significant for Mickey ($p = .001$), Derek ($p = .000$), Rachael ($p = .015$), Charles ($p = .006$), and William ($p = .013$). The presence of adults positively affected the engagement of these students with ASD.

A limitation of this study was that the observations took place during different activities, some academic and some nonacademic. Additionally, the students were

observed for different lengths of time depending on schedules. The authors (Conroy et al., 2004) generalized to the role of proximity on engagement for students with ASD but not to challenging behaviors. Given the above considerations, the findings were difficult to generalize.

While the teacher had a particular role in the classroom, so did a paraprofessional. The paraprofessional has increased contact with the student that could reveal different results. Young and Simpson (1997) investigated the role of paraprofessionals in the inclusion of 3 students with autism in a general education classroom. Specifically, they examined on-task behavior, in-seat behavior, self-stimulatory responses, and inappropriate vocalizations relative to paraprofessional proximity and classroom activity.

The participants were 3 African American males diagnosed with autism. They all attended a Midwestern, inner-city public school and were enrolled in a second- or a third-grade full-inclusion program. Each student was also assigned a paraprofessional.

The participants ranged in functioning level. Jeff was 9 years and 5 months with an age equivalent was 4 years and 2 months. Ryan was 7 years and 11 months with an age equivalent of 1 year 4 months, and Michael was 8 years and 1 month with an age equivalent of 3 years and 3 months.

Young and Simpson (1997) used a direct observation system to evaluate on-task, in-seat, self-stimulatory, and vocalization behaviors in relation to paraprofessional proximity and classroom activity. Activities included group, independent, one-on-one peer, and one-on-one adult work. Each observation session, which lasted 30 minutes, was randomly set across activity type and time of day. The teachers and paraprofessionals were not aware of the purpose or procedures of this study.

Students were most frequently observed during independent work (Jeff = 48%, Ryan = 30%, Michael = 44%) with Jeff also engaging significantly in group work (29%) (Young & Simpson, 1997). All 3 participants were most often on task when they were working one-on-one with a peer for 76%-100% on-task behavior. However, this was not the most common classroom activity. Contrary to other studies (Dugan et al., 1995; Kamps et al., 1994; Kamps et al., 1995; Logan et al., 1997), Young & Simpson (1997) found that group work resulted in the most off-task behavior (Jeff = 43%, Ryan = 54%, and Michael = 68%).

The proximity of paraprofessionals also varied significantly from student to student (Young & Simpson, 1997). Close proximity was defined as the paraprofessional being within 2 feet of the target student. Generally, though, the proximity of the paraprofessional had little impact on the in-seat behavior of the students, similar to that of on-task behavior.

The authors did not generalize their findings, stating that more research was necessary for stronger conclusions (Young & Simpson, 1997). Furthermore, little information was provided about the specific skills of the students, thereby making it especially difficult to generalize to other students with autism in general education classrooms.

Few conclusions could be drawn from the preceding two studies (Conroy et al., 2004; Young & Simpson, 1997) given their incongruent results. The leadership and interaction of the adults in a classroom would affect the results of such studies. Thus, further research would be necessary for significant findings.

Individual Strategies

Students with autism are diverse and so are their needs. The following studies (Charlop-Christy & Haymes, 1998; Schilling & Schwartz, 2004) investigated two different but individualized strategies for enhancing academic engagement for students with autism. They sought to address the underlying needs of the targeted students.

Schilling and Schwartz (2004) examined ways to address the sensory needs that underlie behaviors in students with autism spectrum disorders. To increase student engagement and interaction with peers they introduced alternative seating into the classroom. They evaluated the effects of therapy balls as seating on the engagement and in-seat behavior of young children with autism spectrum disorders.

Schilling and Schwartz (2004) worked with a 4 preschool students. They were enrolled in a public school funded preschool program on a university campus. The students were in two classrooms. The first was a 12-hour per week integrated preschool classroom. The second was an 8-hour specialized program for students with autism spectrum disorders.

The 4 preschoolers were identified as males, 3 Caucasian and 1 Asian, and were age 3 years 11 months to 4 years 2 months. They all varied cognitively. They were selected because of teacher reports of students' difficulty with in-seat behavior and with maintained engagement. Engagement was defined as the student attending to designated classroom activities or sharing attention and response with peers in group activities.

The first student, Ryan, 4 years and 2, months had difficulty remaining seated during tabletop activities or while working with peers. He also held unhealthy postures while sitting. Researchers observed Ryan during art at the extended day program.

Sam, age 3 years 11 months, had been assigned a bench without a back to encourage healthy postures, but he usually chose to stand or kneel. Sam's observations also took place during the extended day program, although data collection occurred during reciprocal play activities immediately preceding recess.

Luke, 4 years 2 months, remained in his seat but usually leaned forward putting his head and upper body under the table. If staff were not directly engaged with him in a task he would often leave. Additionally, he had a specialized program to address his oppositional behavior. Observation of Luke took place during the integrated preschool program immediately after lunch, usually art or cooking.

The final student, David, 3 years 11 months, had difficulty staying seated during circle time. Consequently, a staff member always sat nearby to prevent him from rolling around, facing the outside of the circle, or leaving. David was observed during the last activity of the integrated preschool day, circle time.

This study used a single subject withdrawal design of A-B-A-B for 3 of the students and B-A-B for 1 student to demonstrate effectiveness without initial baseline (Schilling & Schwartz, 2004). The alternating A represented baseline/no intervention, and B represented intervention. During baseline and withdrawal phases, the students were observed with their regular seating arrangement until both variables of behavior and engagement were stable. The researchers introduced the therapy balls with no specialized training during the first intervention phase. The third phase returned the students to their original seating arrangement, and the final phase reintroduced the therapy balls. The authors used momentary real-time sampling with headsets that announced 10-second intervals for 10 minutes.

Schilling and Schwartz (2004) used measures to ensure the reliability and validity of the study. Inter-observer reliability was verified at least once per phase. Inter-rater reliability for in-seat behavior was a mean of 98% and for engagement was a mean of 90%. To test the social validity, the program staff completed a questionnaire on their opinions of in-seat behavior and engagement concerning the regular seating option versus the therapy ball alternative for students with ASD.

Schilling and Schwartz (2004) found an increase for in-seat behavior and engagement with therapy balls for young students with autism. For all students, engagement increased significantly during the therapy ball phases of research. A decrease in engagement was observed immediately following the withdrawal of the therapy ball.

Sam's in-seat and engagement data was primarily below 50% during baselines but over 50% (usually above 80% within a 2 days of transition) during treatment (Schilling & Schwartz, 2004). Ryan demonstrated similar results to Sam, although his mean performance for engagement and in-seat behavior did not exceed 80% until the final treatment. His engagement during the second baseline, however, was around 60%. David's results were less consistent, though the overall trend was below 70% during baseline and above 60% with a steady increase during treatment.

Out of seat behavior was not initially a problem for Luke, as mentioned previously (Schilling & Schwartz, 2004). His engagement was above 60% during treatment and ranged from 20% to 40% during the reversal phase. Luke also demonstrated improvement in reducing oppositional behavior. No oppositional behavior

was observed while the therapy ball was implemented, but it did occur with the reintroduction of typical seating.

Procedures and data were not explicitly described in the text but could be inferred from the graphs. Schilling and Schwartz (2004) did not over step the bounds of generalizability. They were clear to suggest that this strategy was useful for these particular students with autism, but that all students with autism vary considerably. They believed that therapy balls were a worthwhile strategy that teachers should try out with students of their own.

Addressing the underlying needs of students with autism could significantly increase desired outcomes (Schilling & Schwartz, 2004). The use of obsessions in the following study (Charlop-Christy & Haymes, 1998) also attended to the underlying interests, sensory or otherwise, of students with autism spectrum disorders.

Charlop-Christy and Haymes (1998) investigated the effectiveness using objects of obsession as token reinforcers in increasing task performance for 3 students with autism. Reinforcers, they claimed, were common in schools because they were particularly easy to use and required no training for implementation. The challenge for teachers was that students with autism were not often motivated by such reinforcement. This study individualized the strategy to encourage on-task behavior and progress in academic tasks for students with autism.

All 3 students diagnosed with autism were selected to participate in this study based on a continual lack of motivation and limited to no progress on assigned tasks. Off-task behavior included self-stimulation and self-injurious behaviors. All students had obsessions with particular objects and threw tantrums if their object was removed.

Dustin was a 9.2-year-old boy who was also non-verbal. His age equivalent was 4 years and 11 months, and he had an IQ of 52. He was obsessed with trucks, trains, and “micromachine” cards.

Adrian was a 9-year-old boy with high-functioning autism. He was integrated into a general education classroom. Adrian had an IQ of 57 but scored a quotient of 93 on the nonverbal intelligence section. His obsessions included particular letters of the alphabet, videos, and video characters.

Erin, 7.9 years old with an IQ of 67, was the only female participant. Her obsession was plastic beads.

All three students participated in a biweekly after-school program specializing in behavior management. The study took place in a therapy room attached to an observation room with a one-way mirror.

Charlop-Christy and Haymes (1998) employed a multiple baseline design across students and a within-student reversal analysis in assessing the effectiveness of traditional tokens (stars) versus objects of obsession as tokens. The tasks were individualized for each student based on activities with low performance. They included both academic and occupational tasks.

Each work session was 15 minutes. No more than one session occurred per day with 2 to 5 days between sessions. Tasks were presented in varied order, and to all correct answers, the experimenter provided praise and a token. After an incorrect answer or a 5-second delay, the experimenter moved on. After three consecutive incorrect or failed responses, there was a correction trial, praise, and a token for correct response. Once the student earned five tokens, he or she could exchange them for a backup

reinforcer, food. Meeting criterion meant 80% correct responses for two consecutive sessions.

During each session, the experimenter collected data on task performance and rate of inappropriate behaviors (Charlop-Christy & Haymes, 1998). Additionally, an observer recorded the same data from behind the one-way mirror. A videotape was used to examine ancillary behavior, either positive or negative, from using objects of obsession as tokens.

Baseline used familiar reinforcers, stars, for correct responses. During the treatment phase, procedures followed as before with the modification of tokens. For tokens, Dustin earned “micromachine” cards or trucks, Adrian got to use the letter “A” or names of video characters, and Erin earned plastic beads.

Reliability data was collected for 33% of all baseline and treatment phases. During baseline, interobserver agreement was 97%, 97%, and 95% respectively for Dustin, Adrian, and Erin. As for inappropriate ancillary behaviors, reliability was 94%, 87%, and 90% respectively for Dustin, Adrian, and Erin.

During baseline, Charlop-Christy and Haymes (1998) found that none of the students made academic progress. Mean correct response was 45% for Dustin, 64% for Adrian, and 63% for Erin. However, during the treatment phase, with objects of obsession as tokens, not only did all the students make progress but they all met criterion. Correct response decreased for all students during the reversal period. Erin was the only participant to reach criterion during the initial treatment phase, though the other participants all reached criterion during the reintroduction of obsessions as tokens.

Additionally, inappropriate behaviors decreased during the treatment phases for all participants.

Charlop-Christy and Haymes (1998) discerned that using objects of obsessions as token reinforcers was effective in increasing task performance for students with autism. This increase occurred rapidly with the introduction of the strategy. While inappropriate behaviors did decrease with use of this strategy, results were not as significant as for task performance. Addressing sensory issues as well as using obsessions for positive reinforcement increased the academic engagement for the students with autism.

The triangulation of data validated the findings of this study, as did the extremely high reliability data (Charlop-Christy & Haymes, 1998). Charlop-Christy and Haymes offered concessions and defined the limitation of the reversal back to baseline not occurring for all students. Nonetheless, they stated claims that were further supported by previous research.

This section provided several strategies to increase the academic engagement of students with autism spectrum disorders. Modifying instructional plans to include smaller groups (Logan et al., 2006) and specific schedules (Bryan & Gast, 2000) helped these students, as did addressing autistic behaviors such as repetitive movements (Schilling & Schwartz, 2004) and obsessions (Charlop-Christy & Haymes, 1998). However, the role of adult proximity was unclear, although it tended toward increasing engagement (Conroy et al., 2004; Young & Simpson, 1997). Strategies on multiple levels supported the academic engagement of students with autism in the general education classrooms.

Social Inclusion

Social skills are a particular challenge for students with autism spectrum disorders. Not only did these students have difficulty with social and emotional understanding, but their social behaviors were also at a deficit. The following research will examine the explicit teaching of communication (Kravits, Kamps, Kemmerer, and Potucek, 2002; Ogletree & Fischer, 1995; Sarokoff, Taylor, & Poulson, 2001; Sonnenmeier, McSheehan, & Jorgensen, 2005) and social skills (Bauminger, 2002; Conroy, Asmus, Sellers, & Ladwig, 2005; Kamps et al., 1998; Travis, Sigman, & Ruskin, 2001) for students with autism spectrum disorders. In addition, social stories were one popular strategy to teach such skills (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling, Myles, Gagnon, & Simpson, 2003).

Language Acquisition

Communication is important for any student. Given the challenges for students with autism, a variety of strategies may be employed to support their language acquisition. The following strategies served students with a range of communication abilities (Kravits et al., 2002; Ogletree & Fischer, 1995; Sarokoff et al., 2001; Sonnenmeier et al., 2005).

Kravits et al. (2002) evaluated the effect of the Picture Exchange Communication System (PECS) on the spontaneous communication at home and at school for a 6-year-old girl with autism. They were interested in the effectiveness of the program and its use by others, as well as its generalizability at home and at school. They were further interested in its effects with social skills training on social interaction.

Molly had an age equivalent age of 2 years 8 months, and she scored within the 27th percentile for verbal behavior and the 1st percentile for adaptive behavior. She was integrated in a half-day kindergarten program with the assistance of a para-professional. She also received special education services from either the learning resource teacher or the language therapist. Her communication skills were limited, and she used one- to two-word utterances to communicate her interests. These utterances were difficult to understand and infrequent, though more utterances were exhibited at home than at school.

The study took place during leisure and snack time at home and during structured play with peers at school. The targeted behaviors included spontaneous communication such as requests, comments, or expansions. Such communication was only counted if it did not follow prompting. Data was collected over 10-minute intervals, and the experimenters recorded what was communicated, the mode of communication, the function of communication, and to whom the communication was directed. Also, every 5 minutes, the researchers collected social interaction data on a laptop computer using Multi Option Observation System for Experimental Studies (MOOSES) to code for duration of interaction. This data was collected at least once every session for all settings.

Kravits et al. (2002) used a multiple baseline experimental design across settings with phases alternating between treatment and non-treatment. For the initial baseline, the researchers observed Molly during play across settings. Data collection included the frequency of spontaneous language and social interaction over 4 weeks. During the following phase, the second baseline, the communication board with symbols was introduced to the setting but Molly was not prompted to use it. This data was collected as

in the initial baseline except the duration was 1 week at home, 12 weeks during centers at school, and 17 weeks during journal time at school.

The PECS was put into practice according to the manual and across all settings during the treatment phase. Explicit instruction of PECS was immediately followed by practice. Additionally, Molly's peers received a brief training reviewing the communication system to support its use in the classroom.

Phase C assessed Molly's social interaction using the communication system. During this time, all students received some sort of social skills training. The particular skills of interest were sharing, turn taking, asking and answering questions, and extending play interactions.

To ensure validity and reliability, Kravits et al. (2002) collected interobserver data for each language variable and reliability data for social interaction. The percentage mean agreement for verbalizations and for mode of communication was between 91% and 97% depending on the phase and between 86% and 89% for function. Reliability data on MOOSE for the primary and secondary observers was 86%.

During the initial intervention phase of PECS's use, Molly demonstrated an increase in icon use across settings (Kravits et al., 2002). Previously, she had not used the icons during baseline though they were available. Additionally, at home and during journal time, she demonstrated an increase in intelligible verbalizations with a range of 15 to 16 occurrences and 5 to 8 occurrences respectively.

Furthermore, Molly also increased her initiation during play from 8 or 9 during baseline to 18 during intervention at home (Kravits et al., 2002). At school centers, she

rose from 3 to 5 initiations to 11 during intervention for school centers and for journal time, 4 to 7 initiations rose to 14.

Change in duration of social interactions was limited at home due to her brother being the only peer, but change was noted in one setting at school (Kravits et al., 2002). For journal time, increases were noted from 26 to 60 seconds during baseline to 146 seconds during treatment. The authors (Kravits et al., 2002) did note the potential influence of proximity in relation to the increase during this time.

Kravits et al. (2002) concluded that PECS was effective in increasing the communication skills of young students with autism. Not only did Molly's use of the icons improve but also did her frequency of verbalizations and initiations in social interactions.

While this study did contain quantitative data, there was little to no mention of participant selection and comparison to a control group. Given the single participant nature of this study, it was difficult to conclude that the PECS would work for all students with autism. However, the use of multiple observers further legitimized the research findings for the participant.

Augmentative and Alternative Communication (ACC) systems are the only manner of communication for some students. There are cases, like the following study (Sonnenmeier et al., 2005), where the Picture Exchange Communication System would not be the best alternative for a student. The subsequent study used the Beyond Access planning model to better support a 10-year-old student with autism in a general education classroom. The purpose of the study was two-fold, one, to examine the implementation

of the model and two, to investigate the outcomes of the particular communication system for a targeted student.

Sonnenmeier et al. (2005) conducted the case study in a small, rural town in southern New Hampshire. The school district had been committed to including students with significant disabilities in the general education classroom for the past decade.

Jay, the single participant in this study, was 10 years and 3 months at the initiation of the 15-month study. When Jay was diagnosed with autism, and at 8 years and 9 months, he had an informal academic level of 18 months to 24 months. He participated in multi-level/parallel curriculum executed by an instructional assistant in the classroom. Although Jay was non-verbal, he did use facial expressions, pointing, and a few manual signs to convey his needs. The Picture Exchange Communication System was used and phased out with the introduction of a voice output communication aid (VOCA).

Jay had an educational team that included his father and stepmother, classroom teacher, instructional assistant, speech-language pathologist, occupational therapist, special educator, and district Augmentative and Alternative Communication (ACC) consultant. The Beyond Access model was a framework that guided the team to implement and evaluate strategies to enhance his inclusion in the classroom and the school. In congruence with the Beyond Access model, the authors (Sonnenmeier et al., 2005) used an observational case study method. Reliability and validity data was monitored through the required consensus on practices.

Jay's yes/no response on his "Go Talk" was inconsistent. Therefore, the team investigated an alternative voice output communication aid intervention, "Speaking Dynamically" Pro (Sonnenmeier et al., 2005). Within 2 months of intervention, Jay

increased his reliability to accurate and consistent yes/no responses on the VOCA.

“Speaking Dynamically” Pro on a desktop computer proved successful. He used several programs to communicate requests using single words and word combinations. Jay was also able to recognize more words in print.

Jay’s educational team was able to identify underlying issues that helped them plan and evaluate support structures for Jay (Sonnenmeier et al., 2005). Sonnenmeier et al. believed that values- and evidence-based practices of the Beyond Access model would attend more to the goals of best practice in inclusive education. After implementation, the team reported increased engagement in lessons from Jay and increased work with grade-level content.

There were some limitations, however, regarding the model. This study (Sonnenmeier et al., 2005) took place with the leadership of an external mentor who would not be available for implementation in other cases. Also, data was reported as descriptions of progress. While these descriptions were useful and legitimate, evident increases in Jay’s communication were limited. Nonetheless, the Beyond Access model was useful in supporting Jay’s communication development and inclusion in a general education classroom.

Not all students had such extreme challenges communicating as Molly (Kravits, 2002) and Jay (Sonnenmeier et al., 2005). Some simply needed additional support in developing their language skills rather than learning to communicate (Ogletree & Fischer, 1995; Sarokoff et al., 2001).

Ogletree and Fischer (1995) aimed to determine and describe the effectiveness of a language treatment program in facilitating the semantic/pragmatic language

development in a student with high-functioning autism. They chose a video and role-playing treatment that was fun, thereby increasing the potential for use.

The individual in this study, J.M., was a girl of 5 years 9 months. She was enrolled in a typical kindergarten and participated in speech and language therapy at a university clinic.

Ogletree and Fischer (1995) used a single-subject multiple-baseline-across-behaviors design, similar to other research, for this study. The clinician, the third author, collected a two-hour language sample to analyze for semantic/pragmatic errors. The dependent variables selected were gaze efficiency, responding without delay, and topic maintenance.

Treatment was 7-weeks with twelve 45-minute sessions conducted by the third author and under the first author's supervision. Each dependent variable was measured for four sessions each. The treatments began with a short review of the target variable with J.M. The subsequent brief video segments were selected from Disney films due to the participant's special interest in Disney characters. After viewing the film, the clinician discussed the interactions, sometimes using a non-example, and had J.M. identify the target variable. After viewing, the clinician and J.M. role-played the segment. The process was then repeated four or five times.

All sessions were videotaped using a concealed camera with an external microphone. A graduate student in speech-language pathology, naïve to the study's purpose, analyzed the data. She transcribed the videotapes verbatim and evaluated the frequency of dependent variables for appropriateness.

Treatment demonstrated an increase in appropriate gaze for J.M. (59% and 61%) with maintained results during subsequent non-treatment phases (Ogletree & Fischer, 1995). For responses without delays there were no significant trends. Treatment did, however, increase the appropriate length of topic (conversation) episodes from baseline (47%, 54%, 50%, 47%) to treatment (50%, 100%, 100%).

Though a lengthier treatment would have been useful, as stated by Ogletree and Fischer (1995), they believed that this strategy would be effective for a number of weaknesses in semantic/pragmatic language development for children diagnosed with autism and similar weaknesses. The authors suggested that video intervention could easily serve as a home-based treatment.

Regardless of the potential confounding variables, the authors claimed the increase over just four sessions was significant (Ogletree & Fischer, 1995). However, no reliability data was collected nor was the data triangulated to ensure reliability and validity. Given the significant limits of this study, including limited time for data collection and the lack of reliability data and significant results, caution should be used in applying the strategy.

Using special interests such as Disney characters in the previous study (Ogletree & Fischer, 1995) or favorite items with textual cues as in the subsequent study (Sarokoff et al., 2001) could maintain the interest of children with autism. Imitating dialogue, like in these studies, was one way of acquiring language skills.

Sarokoff et al. (2001) hypothesized that if a stimulus had a natural textual cue printed on it, such as the product name, then supplementary textual scripts could be faded

out. Script-fading was a way to increase communication skills. The stimulus was tested to see if it would engage students in conversation after a script was eliminated.

The 2 participants in this study were enrolled in a day education treatment center for children with autism. The 2 individuals could both read at least 50 sight words prior to the study. The first participant, Lou, was 8 years old and attended the center for half the day. The other half of the day, he received support in a typical classroom. He was labeled as borderline intellectual functioning. Jack was 9 years old and spent the entire day at the center. He showed a moderate level of mental retardation.

The stimuli were two sets of snacks and one set of video game cases with embedded text such as a product name. The stimuli were placed on top of the corresponding script that contained six to seven conversation statements. In addition, the first word in each script was congruent with the embedded text.

The dependent measures were the number of statements made, both scripted and unscripted, during a 3-minute period. Unscripted statements were recorded verbatim.

Sarokoff et al., 2001 used a multiple baseline across settings design for this study. The students were taught to read the script, which was not included in the baseline phase, in preparation for the study. The session began with the presentation of the stimuli and a verbal prompt to “have a snack” or to “play video games.” The scripts took the students through conversational steps in having a snack or playing a video game with another individual. If students strayed from the script, non-verbal prompts were given. After five intervention sessions of 50% correct use of the script, a new stimulus and script were introduced. After each student read the script for two sessions, the script-fading began. In five steps, 35% of words were eliminated from the script until no words were left.

One to 3 months later, novel stimuli with no script were used with a novel peer. Sessions took place 1 month later to observe the students with the absence of prompts.

To guarantee reliability, interobserver agreement was recorded for 80% of all sessions, for intervention agreement of 93% (range 88%-100%) for Lou and 96% (range 90%-100%) for Jack. Baseline agreement was 100% for both participants.

Both participants increased their scripted and non-scripted comments with the introduction of the embedded stimuli (Sarokoff et al., 2001). Results showed that during baseline, Lou only talked when Skittles were available. During intervention, he not only completed the script but also added in relevant unscripted comments. Jack made several comments during baseline, though this increased with intervention. Generalization varied between the 2 participants. Lou made 7.5 unscripted statements whereas Jack made 3 with the novel stimuli. With the introduction of a novel peer, Lou made a mean of 7 scripted and 9.5 unscripted statements, and Jack made 5 scripted and 0 unscripted statements. Without the presence of adult prompts, both boys continued to use the script for a mean of 6 and 5 scripted statements for Lou and Jack respectively.

Sarokoff et al. (2001) found the embedded textual stimuli to be effective for both Lou and Jack. Even with script-fading, novel stimuli, and a novel peer, the participants continued relevant conversation. Unscripted statements were only present with adult prompting.

The script-fading strategy had its limitations (Sarokoff et al., 2001). It would only be feasible for conversation in present tense based on the existence of the stimulus. Sarokoff et al. did address limitations of generalizing this study given the lack of pretreatment data. As such, results should be viewed with caution but not dismissed.

Language acquisition existed in a range of levels for children with autism spectrum disorders. Some needed Augmentative and Alternative Communication systems while others may simply have needed help with semantic/pragmatic cues in dialogue (Kravits et al., 2002; Ogletree & Fischer, 1995; Sarokoff et al., 2001; Sonnenmeier et al., 2005). Depending on the abilities of the individual, different systems or strategies were useful. Language acquisition is a preliminary step in social development.

Social Skills Training

Social skills are often lacking in students with autism spectrum disorders. At the same time, they are expected to have those skills to meaningfully participate in general education classrooms and public schools. The following studies (Bauminger, 2002; Conroy et al., 2005; Kamps et al., 1998; Travis et al., 2001) attended to the social skills of students with autism and methods to teach those skills without significant change to the classroom routine. A subsection specifically addressed social stories as a method of explicitly teaching social skills (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling, Myles, Gagnon, & Simpson, 2003).

Travis et al. (2001) investigated the potential relationship between social understanding and social interaction in verbally competent children with autism. They examined the potential relationship between measures of social understanding and social interaction, specifically peer interaction and prosocial behavior. They compared a group of children with autism to a control group of children with developmental delays.

The participants included 20 children with autism (including one girl) and 20 children with developmental delay (DD) (including 3 girls). They lived in the Los Angeles area and were selected from a group in a larger longitudinal study.

The children with autism ranged in age from 8 years 6 months to 18 years 6 months with a mean age of 12 years 8 months. They were matched with the developmental delay control group according to language age and IQ (mean of 76.8 for the autism group). The mean mental age was higher for the autism group than the DD group, although the difference was not statistically significant ($p < .01$).

The measures were joint attention, false belief understanding, responsiveness to distress, affective perspective taking, empathy, peer interaction, and prosocial behavior (Travis et al., 2001). Joint attention was recorded each time a child attempted to draw the experimenter's attention toward a toy for reasons other than requesting use. The child's response to having his or her name called or the experimenter pointing was recorded as well. The generalizability coefficient for joint attention was 0.80.

Three tasks comprised the false belief understanding measure. The child provided justification for the location of an object, then for real people, in a brief scenario. Next, the child was to name the contents of a candy box without looking inside, and pencils were then revealed rather than candy. Generalizability was measured.

The experimenter pretended to bump her knee and exclaim in pain for the responsiveness to distress measure (Travis et al., 2001). The interrater reliability for this measure was 1.0.

Affective perspective taking assessed the child's identification of emotions portrayed in vignettes. The participant also responded to how the vignettes made him or her feel. Scores were given on accurate identification of the emotions.

Travis et al. (2001) observed peer interaction during the least structured part of the day for each child, usually recesses. To account for the range in observation times, 31 to 64 minutes, peer interaction data was calculated as a proportion of the total time. High-level play was coded in 15-second intervals for interrater reliability of 1.0.

The final measure, prosocial behavior, included sharing and helping behaviors (Travis et al., 2001). The participants were provided two opportunities for each during a refreshment break. Interrater reliability for this measure ranged from 0.79 to 0.91.

The only significant differences between groups were for peer interaction ($p = .002$) and prosocial behavior ($p = .027$) (Travis et al., 2001). The group with autism performed lower in both of these measures than the group with developmental delays. Joint attention, concern to distress, and empathy were all moderately reliable ($ps = .06$) with the autism group again performing lower than the developmental delay group.

False belief understanding was strongly or reliably correlated with all intellectual and linguistic measures for both groups (Travis et al., 2001). Initiating joint attention and empathy were both strongly correlated to prosocial behavior ($p < .05$ for both measures) and peer interaction ($p < .01$ for both measures) for the group with autism.

Differences were revealed for correlations between initiating joint attention and peer interaction for the two groups ($p < .005$) (Travis et al., 2001). In addition, prosocial behavior and peer interaction were significantly correlated for the group with autism ($r = .49, p < .05$) but not for the group with developmental delay ($r = -.026, p < .90$).

Group differences in mental age did not seem to affect the results in other measures (Travis et al., 2001). The children with autism demonstrated less initiation of joint attention, empathy, concern to distress, and social interaction than language age and IQ matched children with developmental delays. The greatest differences between these groups were noted for both peer interaction and prosocial behavior with social understanding and responsiveness following (joint attention, concern for distress, and empathy). Thus, deficits in intuitive, non-verbal forms of social understanding were found to be closely related to deficits in social interaction in high-functioning children with autism.

There were some limitations in the study (Travis et al., 2001). Not all measures were attained for all participants because of time limitations and lack of participant cooperation. In addition, their data collection methods were not well described. Overall though, the authors took extra steps to guarantee the validity of their results, using more than one test in some cases. Interrater reliability was also high for most measures, strengthening the findings.

Physical integration in general education classrooms, for example, does not equate social integration for students with autism spectrum disorders. Given the potential social deficits of these individuals, social training is important. There were several methods of doing so including peer-based programs and individual programs (Bauminger, 2002; Conroy et al., 2005; Kamps et al., 1998).

Kamps et al. (1998) studied the social validity of peer-mediated programs that included students with autism. Students in multiple settings across 5 years were surveyed or interviewed about their opinions regarding the inclusion of students with autism in

both social and academic programs. The secondary purpose was to measure peer interaction time as an effect of the peer-mediated programs.

A total of 38 students with autism participated in this study (Kamps et al., 1998). All students were between the ages of 5 and 11 and ranged from low to high functioning. Four of these students were non-verbal while 11 used two to three word requests. Twelve students spoke in sentences and the rest fell between.

Two hundred and three peers were also interviewed or surveyed. They were enrolled in 27 general education classrooms in 13 schools. Seventeen classrooms were designated as urban and 10 as suburban.

Peer groups were divided into three categories, academic or tutorial, social, or a combination of academic and social. Tutoring activity sessions lasted 10 minutes whereas social activities lasted 10 to 15 minutes of practice followed by another 10- to 15- minute block of play. Some of the peer programs were classwide while others were with small groups, cooperative learning groups, or social or play groups. Programs lasted 4 weeks to 6 months.

Baselines varied slightly due to the nature of the programs, but all included students with autism and students without autism. The targeted students with autism sat in close proximity to at least 1 peer for academic tasks and 1 to 4 peers for social activities. The intervention phase included the addition of peer/target training to address the social skills and materials use necessary for completion.

Kamps et al. (1998) used several measures that encompassed social interaction, peer interviews, and consumer satisfaction. Peer interaction time, defined by an initiation

by another student followed by a response within 3 to 5 seconds, focused on the reciprocity and duration of the interaction.

Consumer satisfaction peer interviews were conducted for 23 of the 27 classrooms. The questions addressed students' thoughts about the inclusion of peers with disabilities and their interactions. These interviews averaged 4 to 6 students from each program, using those who were most frequently in groups with the students with autism. As well, whole class Likert scale surveys encompassed similar topics.

The majority of peers had positive attitudes toward the programs and toward working with their peers with autism (Kamps et al., 1998). Ninety to 98% reported that they liked being in a group with a named student with autism. Ninety-four to 98% reported that it was a good activity that same student. When asked if they would spend time with the student again, 87% to 96% stated yes and gave ideas of how.

Similar results were found in consumer satisfaction results (Kamps et al., 1998). Eighty percent of the students who participated in the five classroom surveys reported that they liked having the students with autism join them for social groups.

Peers in two of the classes participated in "affection activities" where students with autism joined a general education classroom to sing songs and play interaction games for 15 to 20 minutes. Seventy percent of the peers in these classes responded that they liked having the students with autism come to their classrooms and the same percent agreed that they would like to do more of the same activities (Kamps et al., 1998). Seventy-two percent of the peers stated that the affection activities were good for the individuals with autism.

Overall, Kamps et al. (1998) found that social intervention with explicit attention to social skill building positively influenced the genuine inclusion of students with autism. From the data, they concluded that structured reciprocity in interaction might be stronger than relying on interaction occurring naturally. Their second major conclusion was that peers were generally accepting and favorable of the inclusion of students with autism in social activities. As such, Kamps et al. concluded that structured play opportunities could increase the social engagement and genuine inclusion of students with autism.

Despite the variation in program length, the authors (Kamps et al, 1998) were clear about their involvement in the selection and preparation process. The experimental design also varied from site to site, though previous studies included detailed descriptions of the procedures at each site. The study demonstrated strengths for an interview- and survey-based design.

The following study (Bauminger, 2002) investigated the inclusion of peers in explicit social skills instruction for students with autism. Bauminger examined the effectiveness of a 7-month cognitive behavioral intervention on the social-emotional understanding and social interaction of high-functioning students with autism. The specific question addressed was whether or not students with autism could develop their ability to solve social problems, their emotional understanding, and their ability to socially interact with peers. Students received explicit social training in social-interpersonal problem solving and affective education.

The Special Education Department recruited the participants in the study from four settings throughout Israel. The 15 participants ranged in age from 8 to 17 years with

a mean age of 11.25 years. The mean full-scale IQ was 81.36. The requirements for inclusion in the study were a diagnosis of autism, a verbal IQ of 69 or higher, and consent from educational personnel. Of the 15 participants, 4 were girls and 11 were boys, and they were all enrolled in regular education settings. The only exception was a student who attended a special education school for students with mild mental retardation. All students came from middle-class families in large urban areas.

Measures to assess change in social cognition and social functioning were administered prior to and immediately after intervention. The problem-solving measure evaluated social cognition and emotional understanding, in essence, their problem solving processes in the emotional context. The same nine scenarios were presented to the students to evaluate pre- and post-test results. The beginning and end of the story already existed, and the student was to compose the body of the story and offer alternatives.

Additionally, the emotion inventory assessed the student's experience with and understanding of 10 simple and complex emotions. Each student defined an emotion and conveyed a time he or she experience that emotion. The data was evaluated on three levels, knowledge (number of emotions), audience (inclusion of others affected), and general versus specific responses. Again, students were evaluated before and after treatment, although, the treatment only explicitly taught simple emotions.

Change in actual social behavior and demonstration of social skills was observed as students interacted with peers outside of their peer circle. Observations took place during pre- and post-intervention recesses, with only one behavior observed per session. The observer coded for positive, negative, and low-level social interaction. Reciprocity in social interaction was critical.

Bauminger (2002) used an ecological treatment model that was conducted by the classroom teacher. The intervention curriculum was used 3 hours per week over 7 months. Each student also met with an assigned peer during recess and after school to practice the social skills. The curriculum consisted of prerequisite concepts, affective education, and social-interpersonal problem solving. During intervention, teachers taught the curriculum, facilitated opportunities for peer interaction, and kept the student's parents informed.

A multivariate analysis with repeated measures revealed significance of $p < .01^2$ for progress in the problem-solving measure from pre- to post-intervention for students with high-functioning autism (Bauminger, 2002). After intervention, students with high-functioning autism could offer more relevant solutions and presented fewer nonsocial solutions to scenarios.

Emotional understanding was measured on multiple levels (Bauminger, 2002). First, for the knowledge dimension, significance was reported at $t(14) = 4.09$, $p < .001$ for complex emotions and $t(14) = 2.43$, $p < .02$ for simple emotions. Initially, 60% of students could provide examples of four basic emotions, and after treatment, all students could do so. Significance for the audience dimension was found to be $p < .000$ for inclusion of an audience for simple, complex, and overall emotions, an increase of inclusion after treatment. For the general versus specific dimension for both basic and complex emotions significance of $F(4, 11) = 20.70$, $p < .000$ was found. The students were more likely to provide more specific examples of complex emotions after treatment.

Descriptive analyses illuminated the primarily positive nature of social interaction for the category of social behavior (Bauminger, 2002). Significance of $p < .001$ was

found for positive social interaction and $F(1, 14) = 26.12, p < .000$ for type of behavior. The target students were more likely to initiate social interaction and respond positively to peers after intervention. In addition, after treatment, they were more likely to initiate positive interactions than to simply respond positively. From pre- to post-treatment, significance was revealed for eye contact, $F(1, 14) = 20.60, p < .001$; talking expressively to others, $F(1, 14) = 7.99, p < .01$; and sharing experience, $F(1, 14) = 11.55, p < .01$. Significance was also revealed for type of behavior for the same positive behaviors, eye contact, $F(1, 14) = 18.87, p < .001$; talking expressively to others, $F(1, 14) = 13.00, p < .01$; and sharing experience, $F(1, 14) = 11.86, p < .01$. Students demonstrated growth in positive social interaction after intervention.

For the final set of analyses, the teachers reported on overall social skills. The students' scores on the Social Skills Rating demonstrated significance of $F(3, 12) = 13.04, p < .001$ for cooperation, assertion, and self-control (Bauminger, 2002). Follow-up tests revealed that, after treatment, the target students increased in cooperation, $F(1, 14) = 11.65, p < .01$ and assertion, $F(1, 14) = 24.34, p < .001$.

In summary, the students with high-functioning autism demonstrated increased social skills with the cognitive behavioral intervention (Bauminger, 2002). They demonstrated development in their social cognition and problem solving skills, emotional understanding, and positive social interaction behaviors, primarily in expressing interests and sharing experiences. The students also exhibited qualitative changes from the pre- to post-tests in the nature of their solutions to social scenarios and were able to identify more examples of emotion than before.

Bauminger (2002) used measures piloted on other students to ensure the validity of the study. Though a pre- and post-test was delivered for multiple measures, Bauminger conceded to the lack of a control group in this study. Despite this factor, conclusions were drawn on the basis of other research and lack of significant correlations for social improvement and age development. The conclusions were declared as a powerful model to develop the social-emotional understanding of high-functioning students with autism.

Supplementary collaboration between students is not always possible or reinforcement may be necessary throughout the day. Conroy et al. (2005) explored strategies for social skills training for students with autism that involved little change to routine for general education teachers. Conroy et al. sought alternatives to consequence-based interventions. In the following study, they investigated the effectiveness of visual cue cards, an antecedent-based intervention, on the rate of stereotypy and engagement and also the percentage of time engaged in stereotypy for a student with an autism spectrum disorder. Engagement was defined as “behaviors consistent with appropriately engaging in a task, such as manipulating objects or work materials, facing the instructor or task, or requesting information related to the task” (p. 224).

Matt was a 6-year old, white, male kindergarten student diagnosed with high functioning/mild autism. He was in an upper middle class family and was enrolled in a public school in a rural community. For 90% of the day, Matt participated in a general education class with the remaining time in a resource room. He had difficulty socially, partially due to stereotypic behavior such as hand flapping. Both the teacher and other

students found this distracting, and his parents did not want him to look different from other students. The stereotype was most prevalent in mathematics.

This case study used visual cue cards to identify when stereotypy was and was not allowed. One card with a red circle designated that stereotypic behavior was ok and another with a red circle with line through it designated that the behavior was not ok.

Observations used real-time data collection coded as targeted behaviors occurred. The observation sessions were also videotaped and then coded following each session to calculate the frequency of stereotypy and engagement for Matt.

This study was comprised of five phases. First was a descriptive assessment to obtain information on influences and potential functions of the stereotypic behavior. Following was a functional analysis of the stereotypic behavior. Observation was videotaped and five conditions (tangible, escape, attention, free play, and alone) were evaluated. All sessions lasted 5 minutes and were counterbalanced.

Using the preliminary information, Conroy et al. (2005) conducted an alternating treatment with each condition counterbalanced across 14 sessions. A research assistant, in conjunction with the school, designed the antecedent-based treatment during baseline.

Treatment phases explicitly taught Matt that stereotypic behavior was not appropriate during certain parts of day. To distinguish those times, cue cards were placed on his desk. The research assistant prompted Matt to the intervention at the beginning of each session and pointed to card as a reminder when necessary. No other consequences were applied. In the final phase, the research assistant taught the teacher assistant to use the cue cards for other academic activities.

Inter-observer reliability was collected by a graduate student who served who independently coded 27% of the sessions (Conroy et al., 2005). MOOSESES, a second-by-second time-based method for inter-observer agreement was used for this study. Average agreement was 93% for stereotypy and 85% for engagement.

The descriptive assessment and functional analysis revealed that Matt engaged in stereotypy across settings (Conroy et al., 2005). The rate of stereotypy was highest in the alone condition with a mean of 3.44 incidences per minute.

During baseline, stereotypy was observed at a rate of 0.37 incidences per minute (range 0-1.50) and a mean of 2.11% of the observation time (Conroy et al., 2005). For engagement the mean was 0.54 per minute (range 0.1-1.40).

The rate of stereotypy was found to be lower and engagement slightly higher with the presence of the stereotypy unacceptable card during treatment (Conroy et al., 2005). When the visual cue card depicting that stereotypy was not acceptable was visible, the rate of stereotypy was lower with a mean of 0.13 incidences per minute (range 0-0.40 per minute). When stereotypy was acceptable, it occurred at a mean of 1.32 incidences per minute (range 0.1-3.39 per minute). The cue cards had a minimal effect on engagement.

During the replication phase, when stereotypy was not acceptable, incidences were similar to the treatment phase and occurred at a rate of 0.15 per minute (range 0-.27 per minute) (Conroy et al., 2005). However, when stereotypy was acceptable according to the cue cards, it occurred at a higher rate of 3.24 incidences per minute (range 0.77-7.24 per minute). The cue cards, again, had little effect on Matt's engagement.

Overall, Conroy et al. (2005) found the visual cue cards to be effective in reducing the rate of stereotypy. The cue cards, however, did not influence the rate of engagement. Matt was able to engage whether or not he was involved in stereotypy.

Conroy et al. (2005) addressed limitations of study. The cue cards were not studied alone, and other factors may have contributed. In addition, prompting toward cards occurred periodically throughout the study, and the school year ended during the replication phase. However, the high agreement for stereotypy strengthened the reliability of those results. Furthermore, the triangulation with the research assistant, graduated student, and videotaping added validity to the overall results.

Explicit teaching of social skills appeared to decrease inappropriate behaviors in more than one study (Bauminger, 2002; Conroy et al., 2005; Kamps et al., 1998; Travis et al., 2001). Be it peer buddies or cue cards, students with autism were able to learn social skills to better support inclusion.

Social Stories. Social stories were a common way of increasing appropriate behavior in students with autism spectrum disorders (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling et al., 2003). Social stories are stories written from the perspective of the student that relate an appropriate behavior to a situation in which that student has difficulty. They are tailored to a student's abilities, interests, and comprehension level.

Barry and Burlew (2004) evaluated the use of social stories to improve the social interaction of students with autism spectrum disorders. Barry and Burlew studied the effect of social story instruction on the ability of first grade students with autism to make choices independently and play appropriately during free-play time in a self-contained

Exceptional Student Education (ESE) class. They sought to extend research to include students with severe autism.

The 2 study participants were in the same first grade Florida classroom. Holly was a 7-year-old diagnosed with severe autism. She was able to repeat any language spoken to her and follow many verbal requests, but she would not initiate speech beyond yelling “no.” Holly lived with upper-middle class parents.

Aaron was an 8-year-old also diagnosed with severe autism. He was part of a 2-parent upper-middle class family. Aaron’s only repeated words or phrases initially spoken to him. Aaron also exhibited self-stimulating behaviors including spitting, making vocalizations, and running in circles.

Interventions took place in a classroom with nine play centers used 3 days per week for 30 minutes. The social stories interventions used actual photographs of people and objects in the classroom.

The experimental design was an ABCD multiple-baseline design to assess the effects of social story instruction on the ability of students with autism to make choices independently and play appropriately. The design included a baseline, two treatment phases with different social stories (choice making and appropriate play, playing with peers), and the presence of social stories. The teacher and teacher aide collected all data, including reliability data.

Dependent variables included prompting for choice making and appropriate play (Barry & Burlew, 2004). Prompting for choice making was measured on a 5-point scale. Appropriate play was “defined as interacting with materials and/or peers at a given center

in ways that same-age peers in a general education classroom would typically exhibit in the same situation” (p. 47). Barry and Burlew measured the duration of appropriate play.

Several steps comprised the social stories (Barry & Burlew, 2004). Students had 5 to 7 seconds to respond between each prompt during Phase A, and the duration of appropriate play was recorded. Two social stories were introduced during Phase B. The students were taught through repetition and corrective feedback while they were read the stories each day. A third social story, of how to play with a peer, was introduced in Phase C. The teacher’s aide read the story with each participant during the day. During the final phase, Phase D, the social stories were available and read in the morning with no additional teacher intervention. Inter-observer agreement was 100% for choice making and 97% for play.

Holly made no independent choices in Phase A, though she did make progress throughout the study (Barry & Burlew, 2004). During Phase B, she made choices after one verbal prompt and began to make independent choices during Phase C. Holly continued to demonstrate independence and increased her appropriate play time in the final phase.

Aaron, as well, made no independent choices during Phase A (Barry & Burlew, 2004). During Phase B, he increased his independence using fewer prompts and further increased his independence in Phase C. His appropriate play also increased from a mean of 1 to over 8 minutes. In the finally phase, Aaron made choices after only one verbal prompt.

Barry and Burlew (2004) were clear that this study served as an example of a strategy for teachers to employ. They further addressed that though this strategy was

found to be effective, it should not stand alone in teaching social skills to students with autism. Given the high reliability and the generalization of their findings to the population studied, this research was reliable.

The following study investigated the strengths of social stories as well. Crozier and Tincani (2005) studied the effects of a modified social story on the disruptive behavior of an 8-year-old male student with autism in a preschool classroom. The purpose was to extend research as well as to assess the effectiveness of a story modified from the traditional form. They tested the strategy with and without verbal prompts.

The criteria for participation were a diagnosis of autism, presence of prerequisite skills such as emergent literacy skills and the ability to sit through a story, and finally, the teacher's willingness to participate. Alex's, teachers were worried about his upcoming transition from the school and how his behavior might impact that transition. He was an only child of middle-class parents and was enrolled in a private school for "students with challenging behaviors" (Crozier & Tincani, 2005, p. 152). The school was located in a major metropolitan area in the southwestern United States.

The targeted disruptive behavior of talking out for Alex was determined through teacher interviews as was the time of its greatest prevalence. Talking out was defined as "talking to teachers or other adults without raising his hand or being called on to speak" (Crozier & Tincani, 2005, p. 152). Examples included asking questions, making comments, or asking for assistance. He never lasted more than a couple minutes before another incidence of talking out.

Each incidence was defined as a single word or more directed at an adult and ended when Alex stopped for more than 5 seconds or switched the person of focus. Data

was collected during 30-minute sessions using a tally sheet with the target behavior across the top and the date and time along the left side. The observer sat five to eight feet away from Alex during observation.

A modified social story written by the first author was used for Alex regarding the targeted behavior of talking out. The social story used a replacement behavior in describing the need for the teachers' attention. The story used both words and pictures and followed guidelines for emergent readers. The social story procedures were scripted.

The study used an ABAC reversal experimental design to include baseline and two variations of intervention. During Phase A, the initial baseline, Alex was observed for 30 minutes. Class continued as per usual with Alex unaware that he was being observed. The baseline and intervention phases took place during unstructured independent activity time when students worked quietly at a station of their choice. The first author conducted the intervention and observation sessions while the volunteer assistant and one of the teachers collected interobserver agreement data.

The first intervention, Phase B, began when the first author told Alex that she had a new story for him. After an introduction to the story, Alex read the story aloud. Alex then answered four visual comprehension questions, and the researcher asked Alex what the rule was for talking out. Subsequent sessions began when the research told Alex that it was time for his story. According to the graph, this apparently lasted for six sessions before returning to baseline for what appeared to be another six sessions.

For Phase C, the second intervention, verbal prompts were used in addition to the process in Phase B. Prompts were given on a variable schedule once for every 6 minutes.

Two weeks after Phase C, two maintenance sessions took place. The preschool staff was taught to use the social story. During the maintenance probes, the first author observed Alex during the same time as before.

The researchers ensured integrity and validity in the study. A checklist was used to guarantee that all treatment steps were conducted during each intervention session with interobserver agreement of 100% (Crozier & Tincani, 2005). Interobserver agreement data for the dependent variable was also taken for 25% of the observation sessions. The mean interobserver agreement was 90% (range of 84% to 100%).

Overall, Crozier and Tincani (2005) found that during intervention phases, Alex demonstrated a reduction in the targeted behavior of talking out. During the initial baseline, Alex averaged 11.2 talk-outs per 30-minute observation session. With the introduction of the social story only intervention, he averaged only 2.3 talk-outs per session. However, with reversal, his talk-outs rose to an average of 8 per session. This average promptly dropped to 0.2 talk-outs per session with the reintroduction of the social story and the introduction of verbal prompts. Furthermore, for the two maintenance sessions, his talk-outs remained constant at 0 despite the inconsistency in reading the social story and giving verbal prompts.

Crozier and Tincani (2005) suggested that the modified social story was an effective strategy to decrease the disruptive behavior of this particular student. The successful modification of the social story effectively decreased talking out for the participant. Verbal cues served as beneficial reminders for the student. Overall, Crozier and Tincani, like other researchers (Barry & Burlew, 2004; Keeling et al., 2003), found

social stories to be an effective strategy for teachers to support the social development of students with autism.

It was unclear if it was common or unusual to have this 8-year-old student in a preschool classroom at this school. Nevertheless, Crozier and Tincani (2005) were careful not to over-generalize the findings of benefits to students other than the participant. They did conclude that the modification of traditional social story forms was feasible and could further support a student. Their cautious discussion of the findings strengthened the study.

Given the crucial tailoring of social stories to the student, the following study used another modified social story based on obsessions and preoccupations common to students with autism (Keeling et al., 2003). Special interests were used to encourage positive and appropriate social behaviors. Keeling et al. evaluated the effectiveness of the Power Card Strategy for a 10-year-old student with autism, specifically focusing on sportsmanship skills. The Power Card Strategy of a script and trading card used a special interest of the student to teach or reinforce positive and appropriate behaviors in the classroom or at play.

Nancy was a 10-year old girl diagnosed with autism, and she had an IQ of 100. She spent the majority of her day in a general education fourth grade classroom supported by a para-educator and 90 minutes per day in the special education resource room. The school was in an upper-middle class, large, suburban midwestern city. Nancy's social skills were particularly limited in game situations. She displayed poor sportsmanship when she lost a game. Upon losing, she would whine which then quickly escalated to screaming. As a result of her behaviors, many of her peers did not want to play with her.

The Power Card Script was designed to connect an appropriate behavior or social skills to a particular interest of the student, in this case, Power Puff Girls. The Power Card Script consisted of two parts. The first was a personalized script that included a brief scenario written at Nancy's comprehension level in which her hero worked toward a solution in a situation similar to one she was about to embark. There was also a rationale for the positive behavior with accompanying graphics and a problem-solving strategy outlined in three to five steps. The second component was the Power Card, which was similar to a trading card. It named the hero and synthesized the strategy laid out in the script. Graphics were again included. Finally, Nancy had a scorecard to keep track of who won each game and her performance.

A single-subject multiple-baseline-across-conditions design was used for this study. The duration of whining and screaming was measured across three games, bowling (gross motor), Labyrinth Jr. (board game), and Go Fish (card game). The first author worked with Nancy at the same time daily for twenty 30-minute sessions.

Baseline data was taken for 5 days. The first author introduced the Power Card Script and later the Power Card beginning with the gross motor game, then the board game, and finally the card game. Nancy read the script aloud before playing, and the script remained visible throughout play and scoring. Later, Nancy could choose to read the entire script or just the Power Card. Lastly, the duration of whining and screaming was measured in seconds using a stopwatch.

Keeling et al. (2003) found that during baseline Nancy exhibited whining and screaming in all game settings, which subsequently decreased with the introduction of the Power Card Strategy. For the gross motor game the baseline mean for whining was 18.2

seconds, which dropped to a mean of 4.13 seconds during intervention. Nancy exhibited no screaming during this activity. For the board game whining averaged 6.0 seconds during baseline, dropping to 0 seconds during intervention. The mean duration for screaming was 9.5 seconds during baseline, also falling to 0 seconds during intervention. Nancy engaged in whining during the card game for an average of 13.47 seconds during baseline. This behavior was not observed during the treatment phase. Nancy did not scream during the card game.

Nancy did not generalize the strategy she learned from the first game to the second, though she did begin to do so for the third game (Keeling et al., 2003). Furthermore, Nancy began to generalize the use of this strategy to other situations. She used some of the positive responses from the cards during recess when she lost a game. After the second week of the treatment, Nancy began expanding the options for positive response. These responses were then added to the card. Nancy independently generalized this strategy to other situations and effectively internalized the method. Social stories, Keeling et al. found, based on obsessive interests could hold a students' interest and thus be more valuable than other forms.

The study was conducted under the assumption that the undesirable behaviors only occurred upon losing a game, but this was unfounded (Keeling et al., 2003). Further research could eliminate this potential variable despite its limited occurrence. Additionally, much of the procedure was deduced from the data charts, including the time frame of the activity. However, the study did demonstrate the effectiveness of using obsessions and special interests to enhance social skills instruction.

While the above studies (Barry & Burlew, 2004; Crozier & Tincani, 2005; Keeling et al., 2003) modified the social stories in paper form, the following study (Buggey, 2005) modified it in the form of a movie. Buggey investigated whether or not videotaped self-modeling could increase appropriate behaviors across elementary age students with autism spectrum disorders.

The 4 participants in the study (Buggey, 2005) were all diagnosed with autism spectrum disorders and attended an urban, inclusive private school. They all participated in sensory integration therapy on a daily basis and had IEPs set to state standards.

The school was small with only about 30 students who ranged in age from 2 to 14. About 50% of students did not have disabilities and the other 50% did, of whom 10 were diagnosed with autism spectrum disorders. Classrooms were not leveled by grade but instead divided into preschool, primary, elementary, and middle school –aged groups.

Buggey (2005) became a teacher assistant to integrate himself into the school. He desensitized the students to the video camera as much as possible. In his first 2 weeks, he made two videos for the school in which all students were included. By the time the study started, the students were accustomed to his presence and the video camera.

Buggey (2005) used a single-subject, multiple baseline design, similar to previous research, for the two investigations. Either the author and a college student or the author and teacher collected interobserver reliability data.

Investigation 1 assessed the social interactions of 2 students with autism spectrum disorders in the same classroom. The first student was Roy at age 11 years 3 months. He was diagnosed with autism and was usually very quiet despite his well-developed

vocabulary. During free time and recess Roy would only initiate speech with his best friend, the other participant. He was 2 ½ years below his age level in math and reading.

The second participant was Tommy. He was 9 years 11 months and diagnosed with mild autism/Asperger's Syndrome. He often perseverated on tasks and in his vocabulary. Though he responded to initiations, his responses were typically off topic. He was 2 years below his age level in reading and 1 year below in math. He hardly initiated contact with anyone but Roy.

Social interaction was defined as unsolicited verbalizations to a peer or adult who had not initiated interaction within the previous 10 seconds. Baseline was 2 weeks with videos filmed 1 week prior to intervention to eliminate the confounding effects of role-playing. The author (Buggey, 2005) collected daily observations and a college student observed 2 days per week. The observation forms consisted of recording the behavior, time of behavior, and conditions surrounding the behavior. The time within 1 minute was required for agreement, which was 94%.

The 3-minute video was filmed using a role-playing script, following the social story format. The participant and peers were the actors. Roy or Tommy approached a group of students and initiated social interaction followed by a conversation. They each watched their video in the morning before other students arrived.

Both students improved in their social initiations during the investigation (Buggey, 2005). Roy increased from no initiations during baseline to a maintained average of 4.4 initiations during the intervention. While there was a slight downward trend during the maintenance phase, his initiations still continued. Tommy had 2 initiations during baseline, and maintained 4.25 initiations per day during intervention.

Investigation 2 assessed tantrums for 2 boys, Scott and Aaron. Scott was 6 years 9 months and diagnosed with Asperger's Syndrome. He perseverated on tasks and was easily distracted during academic lessons. He was outgoing and at age level in math and reading. However, his response to criticism or frustration was hysterical tantrums followed by weeping for half an hour and pouting for up to half the day.

Aaron was 8 years 1 month and diagnosed with autism. His math and reading was slightly delayed, but he had good receptive and expressive vocabularies. His obsession was Star Trek. Aaron would respond to academic questions but quickly reverted to Star Trek. A threat to his sense of fairness triggered tantrums. His tantrums could last half an hour as well.

The same procedures were used as in Investigation 1 except that the classroom teacher collected data instead of the college student (Buggey, 2005). This was deemed acceptable due to the length of the tantrums. Also 2 days of maintenance data were collected 2 weeks after intervention. Results within 3 minutes were required for agreement, which was 94%.

The duration and frequency of tantrums decreased with the introduction of video self-monitoring. Scott had a tantrum each of 10 days with two tantrums on 3 of the days during baseline (Buggey, 2005). The mean duration of a tantrum was 16.25 minutes during baseline, 1.6 minutes during intervention, and 2.8 during maintenance. No tantrums were observed during a 2-day follow-up 3 weeks after maintenance. Aaron decreased his tantrums from a mean duration of 19.3 minutes during baseline to 4 minutes during intervention and 2.3 minutes during maintenance. No tantrums were observed during the 2-day follow-up.

Video self-modeling was not only fun for the students but it increased their appropriate behaviors (Buggey, 2005). Parents were also impressed by the behavior change in the students, as were the teachers. Video self-modeling provided students with autism spectrum disorders with positive images of themselves and thus positive social interaction.

Buggey (2005) cited the potential bias he had working at the school but factored in the benefits of the desensitization of the students to his presence and videotaping. However, the high interobserver reliability strengthened the findings. He was careful not to over generalize the findings, stating that future research could further validate video-self modeling as an effective strategy for individuals with autism.

The preceding studies all demonstrated the effectiveness of teaching social skills through social stories for students with autism (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling et al., 2003). Tailoring the stories to the students and using their special interests increased students' engagement in the story. Additionally, the stories took many different forms from paper to video. Overall, explicit instruction of social skills enhanced positive behavior, benefiting students with autism and their peers.

This section demonstrated the challenge of social inclusion for students with autism spectrum disorders, particularly in the general education classroom. It also illuminated the need for social skills development in education for such students. Language acquisition (Kravits et al., 2002; Ogletree & Fischer, 1995; Sarokoff et al., 2001; Sonnenmeier et al., 2005) and social skills development, through social stories (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling et al., 2003) or

otherwise (Bauminger, 2002; Conroy et al., 2005; Kamps et al., 1998; Travis et al., 2001), were effective methods to support the social inclusion of students with autism.

Summary

Chapter three revealed the breadth of strategies available for general education teachers to support the cognitive and social development of elementary students with autism spectrum disorders. Assessing the particular needs of individual students with autism and adopting strategies for specific students are the best determinants for the success of these methods. Chapter three revealed that students with autism did need smaller instructional groups and explicit social skills training to be fully successful in the general education classroom. Strategies to support students with autism spectrum disorders encompassed perspectives of others on autism and inclusions in addition to the acquisition of academic skills, increasing academic engagement, and increasing social inclusion.

Chapter four will describe the historical relevance of findings from the literature prior to summarizing the findings of chapter three. It will suggest implications of the research and give recommendations for public general education teachers. The chapter will conclude with suggestions for additional research on effective inclusion of students with autism spectrum disorders.

CHAPTER FOUR: CONCLUSION

Introduction

Chapter three provided a critical review of current research on strategies for general education teachers to employ in order to support the cognitive and social development of elementary-age students with autism spectrum disorders. It specifically addressed classroom strategies for the inclusion of students in the general education classroom. The chapter reviewed findings regarding perspectives of others on autism and inclusion, the acquisition of academic skills, academic engagement, and social inclusion.

This final chapter will describe the historical relevance of findings as well as summarize the findings in chapter three focusing on their implications for public general education classrooms. Lastly, it will provide suggestions for further research on inclusion practices of students with autism spectrum disorders in general education settings.

Historical Relevance of Findings

All of the research in chapter three was conducted post-IDEA 1990 designation of autism as a legally recognized diagnosis (Vaughn et al., 2003). The majority of the efforts followed the 1997 IDEA revisions that required schools to assume greater responsibility to make curriculum accessible. Since the IDEA updates, significant increases in diagnoses of autism occurred which prompted additional research (CDC, 2006). Autism activist groups such as the Autism National Committee also increased political pressure to fund research on autism spectrum disorders. As a result, much of the research in the field is current and the amount being conducted continues to increase.

The research is increasingly concentrated on effectively including students with autism spectrum disorders in the general education classroom, likely due to the trend toward inclusion (Vaughn et al., 2003). This work supported IDEA mandates and the synthesis of the inclusion movement and the general education reform movement (Villa & Thousand, 2000). Research on autism spectrum disorders presumably followed legal pressure and mandates as opposed to setting the course based on alternative motives.

Summary of Findings

Chapter three illuminated findings regarding education for elementary students with autism spectrum disorders in general education classrooms. The following will further summarize the findings of each section of chapter three: (a) Perspectives on Autism and Inclusion, (b) Acquisition of Academic Skills, (c) Academic Engagement, and (d) Social Inclusion.

The first section of chapter three reviewed the perspectives of adults and peers on the topics of autism and inclusion. The perceptions of others were found to affect the inclusion of individuals with autism in public schools. Adults had a significant role in developing the social status of these students (Kasari et al., 1999; Robertson et al., 2003; Zions et al., 2003). While teachers' relationships with students with autism were found to be affected by autistic behaviors, the student-teacher relationship also impacted individuals' social inclusion in the classroom. The stronger the student-teacher relationship, the higher the social status is of the student with autism.

Parents were another primary influence for children with autism (Kasari et al., 1999; Zions et al., 2003). The reactions of school personnel toward parents, due to race or other factors, was shown to affect parents' perceptions of their child's inclusion in that

school. Parents' concerns of respect and their child's diagnosis were shown to play a role in the placement of their children. They were conflicted about which needs were best to support since any one setting had both strengths and weaknesses.

Finally, peers had certain views of autistic behaviors that were significant in a general education classroom (Swaim & Morgan, 2001). Information about autism was not found to increase the probability that typically developing peers would engage in activities with students diagnosed with autism.

Autistic behaviors were found to be a barrier to social inclusion in particular. The influence of diagnosis, behaviors, and race and special attention to the abilities of students with autism spectrum disorders was critical given the trend toward inclusion in general education classrooms.

The second section of chapter three, Acquisition of Academic Skills, was divided into subsections of Narrative and Storytelling Ability, Whole Class Strategies, and One-on-One Strategies. Narrative and storytelling abilities were found to be lacking in students with autism, even for high-functioning students (Bellon et al., 2000; Caring & Baron-Cohen, 2000; Losh & Capps, 2003). The imaginative and creative elements in stories were a challenge, particularly in conjunction with emotional relevance. However, students with autism performed better in structured narrative settings than they did in open-ended settings. Repeated Storybook Reading was one strategy that provided structure to narrative scenarios (Bellon et al., 2000).

Given examinations of various instructional formats, cooperative learning methods were shown to best support students with autism in the general education classroom as a whole class strategy (Dugan et al., 1995; Kamps et al., 1994; Kamps et al.,

1995). An additional positive effect was noted for typically developing peers and peers with learning difficulties. Peer tutoring and cooperative learning groups both successfully increased academic engagement and success for students. Implicit in these methods were structure and teamwork. When these approaches were used, the students with autism spectrum disorders were found not only to experience academic success but also to increase significantly the duration and frequency of their interactions with peers. Cooperative learning methods proved effective across reading and social studies instruction.

Embedded instruction of targeted skills and priming of lessons also benefited students with autism spectrum disorders (Koegel et al., 2003; Polychronis et al, 2004). One-on-one strategies proved effective when students needed extra support. These strategies, implemented at school or at home, enabled students to reach their potential and develop confidence.

Many students with autism spectrum disorders had difficulty in one academic area or another, though not all. Narrative ability was shown to be one of those contexts. Both whole class and one-on-one strategies were useful in supporting the inclusion of students with autism.

The third section of the chapter reviewed academic engagement for students with autism spectrum disorders in elementary schools. The subsections encompassed Instructional Strategies, Adult Proximity, and Individual Strategies. The previous section noted that students with autism were found to be less engaged academically in whole class instruction if enrolled in a general education classroom (Logan et al., 2006). Independent activities, one-on-one instruction, and pair or small group work proved more

effective, although the rate of success did depend on the individual. Given these smaller instructional formats, the teacher was not always available to direct each student. Picture activity schedules were found to be one way to support the independent progression of tasks (Bryan & Gast, 2000). Accountability in smaller group instructional formats increased the academic engagement of students with autism.

A review of the role of adults in the academic engagement of students with autism proved inconclusive. One study (Conroy et al., 2004) found adult proximity to effectively increase engagement while the other found paraprofessional proximity had little impact (Young & Simpson, 1997). The first study (Conroy et al., 2004) supported a potential increase in engagement of students with autism with adult proximity, but further research was necessary to draw conclusions. The second study had variable results for engagement and diversity in paraprofessional behavior (Young & Simpson, 1997).

Finally, autistic behaviors did hinder the engagement of students with autism. Addressing the underlying sensory needs (Schilling & Schwartz, 2004) or using objects of obsession for reinforcement (Charlop-Christy & Haymes, 1998) did increase engagement. Individualizing engagement strategies for students increased their rate of academic engagement and thus their academic success.

Though academic engagement was a challenge for students with autism, instructional and individual strategies were found to increase engagement, similar to the findings of section two. Smaller instructional groups with schedules and tailored systems to address autistic behaviors increased the academic engagement of students with autism spectrum disorders. These students, therefore, perform better when they are placed in general education settings according to their academic level.

The final section of chapter three, Social Inclusion, reviewed several factors regarding the inclusion of students with autism spectrum disorders in the general education classroom. They included Language Acquisition and Social Skills Training with a particular emphasis on Social Stories. The challenge of language acquisition for children with autism ranged from the need for Augmentative and Alternative Communication (AAC) to support in dialogue. Different communication systems were necessary for dissimilar students. AAC systems proved successful for multiple students (Kravits et al., 2002; Sonnenmeier et al., 2005). The specific abilities of students determined the usefulness of a particular system. In addition, role-playing (Ogletree & Fischer, 1995) and textual cues (Sarokoff et al., 2001) benefited dialogue skills in verbally competent students with autism. Language acquisition was a prerequisite for social skills development.

Social skills were successfully taught through explicit instruction as students with autism did have deficits in this arena, even compared to other students with disabilities. Social-emotional understanding and peer interaction were two areas found to need support (Travis et al., 2001). Peer modeling and cue cards were both unobtrusive strategies that increased social skills for students with autism spectrum disorders (Bauminger, 2002; Conroy et al., 2005; Kamps et al., 1998). Social stories, in particular, were easily adapted to a variety of students, student obsessions, and formats, and they still proved successful and efficient (Barry & Burlew, 2004; Buggiey, 2005; Crozier & Tincani, 2005; Keeling et al., 2003). The more tailored the social story to the student the more successful it was found to be.

Children with autism spectrum disorders were found to lack social skills. Communication strategies and explicit social skills training were effective in developing social abilities in such students. Teaching social skills would better support the inclusion of students with autism spectrum disorders in general education settings.

In summary, given the perceptions of others regarding autism and inclusion, specific steps can be taken to support students with autism spectrum disorders. Such students are increasingly placed in general education classrooms and therefore need cognitive and social support to fully participate. Teachers are integral to this inclusion, and a repertoire of effective strategies and methods will increase the inclusion of students with autism spectrum disorders in the general education elementary classroom.

Classroom Implications and Recommendations

Children with autism spectrum disorders have varying degrees of cognitive and social deficits that must be addressed. With the trend of inclusion for students with autism, general education teachers have a critical role in the educational success of these students. Perceptions play a significant role for students, particularly those with disabilities (Kasari et al., 1999; Robertson et al., 2003; Swaim & Morgan, 2001; Zionts et al., 2003). Therefore, specific strategies must be used to ensure positive perceptions of children with autism spectrum disorders. This will increase their academic success as well as their social standing in a general education classroom.

Given the positive results, teachers should employ cooperative learning methods for instruction to benefit all students, including those with autism spectrum disorders (Dugan et al., 1995; Kamps et al., 1994; Kamps et al., 1995). Not only did cooperative learning groups support students academically, but they also helped students develop

social skills if conducted effectively. Assigning roles and responsibilities designated within the structure of the lesson best supports students with autism.

In addition to being supported in whole class instruction, some students were found to need individualized strategies to support their achievement. Priming students for lessons not only increased their rate of success but also in turn heightened their confidence (Koegel et al, 2003). The students' abilities to succeed also increased their engagement during the lesson. This would take extra time for a parent or family member, but the results were significant. Priming was one strategy that general education teachers should consider for including students with autism spectrum disorders.

Academic engagement was an element of academic success. Increasing engagement then improved achievement and limited distractions for other students. In addition to smaller learning groups (Logan et al., 2006), picture activity schedules (Bryan & Gast, 2000) were an easily implemented strategy to increase accountability and task completion. Not only did student engagement increase, but also the teacher was more available to support other students in the classroom. This strategy could be employed for all students, including those with autism, thereby increasing student independence with prescribed tasks.

Addressing the underlying needs of students with autism was another strategy found to increase academic engagement. If in-seat behavior was a problem for students, alternative seating may well be a viable solution. A therapy ball was one form of alternative seating that if monitored, could lead to success (Schilling & Schwartz, 2004). It met the students' need for sensory integration and was often used in therapy for students with disabilities. Also, if reward systems were used in a classroom, modifying

the reinforcer from commonly used stars to an object of obsession would improve academic engagement (Charlop-Christy & Haymes, 1998). Using autistic behaviors in productive manners allows students to be themselves while better including them in the general education classroom.

Social skills are vital to the inclusion of students with autism spectrum disorders in the general education classroom. To include such students, they first need to be able to communicate effectively with peers and adults. Whether communication was assisted by Augmentative and Alternative Communication systems (Kravits et al., 2002; Sonnenmeier et al., 2005) or supported through role-playing (Ogletree & Fischer, 1995), communication development is important for students with various degrees of autism. One particularly effective strategy for high-functioning students with autism was connecting their special interests to viewing movie scenes and role-playing. Similar to social stories, students viewed a model of desired language and tested it themselves. While not as efficient during academic lessons, this strategy could be employed during therapy sessions or during free play. Language acquisition is critical to social skills development.

Social skills for students with autism spectrum disorders will not fully develop through physical inclusion in the classroom alone. Teaching social skills explicitly would not only support students with autism but their peers as well. Peer-mediated programs were not only favorable to students but they also supported social development (Kamps et al., 1998). They may take the form of academic or social activities in which students with autism were paired or in small groups with typically developing peers. Structured tasks could be effectively modified based on the skill the teacher desired to

promote. Additionally, if stereotypy were a problem and a distraction in the general education classroom, cue cards designating when it was and was not acceptable would improve the child's awareness (Conroy et al., 2005). Strategies that take place throughout the day were important but so were ones that prepared a student for a particular situation.

Social stories were a common strategy for teaching social skills (Barry & Burlew, 2004; Buggey, 2005; Crozier & Tincani, 2005; Keeling et al., 2003). Not only were they easy to implement, but they were also extremely effective for students with autism spectrum disorders. Social stories that used characters of special interest to students with autism, for example, were exceedingly effective (Keeling et al., 2003). Students' heroes, such as in the Power Card Strategy, positively solved social situations with which the students had difficulty. The cards then outlined the hero's strategy and encouraged the students to do the same. Anytime that a teacher tailors a strategy to a student, be it using the student's name in the social story or the student's hero, results will be more effective. Given the overall success of social stories for children with autism spectrum disorders, general education teachers should employ the strategy with these students.

In summary, general education teachers must be prepared to employ strategies to develop the cognitive and social skills necessary for students with autism spectrum disorders to be fully included. Strategies need not be time consuming nor obtrusive to be effective, though they must exist. In light of current research findings, general education teachers must be aware of the influence of their perceptions on students and the need to support the acquisition of academic skills, academic engagement, and social inclusion of students with autism spectrum disorders. The educational and future successes of these

students lie, in part, in the hands of their teachers. Students with autism spectrum disorders can and do achieve academic and social success in the general education classroom with the support of their teachers.

Suggestions for Future Research

Given the literature in chapter three, there are still areas to explore further to support students with autism spectrum disorders in general education settings. School personnel were found to have a noteworthy influence on students and their families (Kasari et al., 1999; Robertson et al., 2003; Zionts et al., 2003). These interactions and relationships are critical to student success. Much of the research reviewed in chapter three applied to younger students while many students with autism spectrum disorders need different types of support as they progress through developmental stages or with later diagnoses. This is especially important in light of the increased diagnoses of autism spectrum disorders and the trend toward inclusion. Some areas for further research include professional development for general education teachers, intermediate elementary strategies that develop academic and social skills together, and improved methods of providing support services in the general education classroom for students with autism spectrum disorders.

A major area for concern in the education of students with autism spectrum disorders is the professional development of teachers, particularly general education teachers. Research supporting effective training models for professional development would increase the probability that the training would be utilized. Additionally, specialized training for teachers and support staff would develop staff confidence. Both

teachers and students would benefit from further research supporting effective training models.

Much of the current research on individuals with autism, as demonstrated by chapter three, encompasses the primary grades, particularly preschool. While social development is particularly important at this age, support in intermediate elementary grades is just as significant. Individuals do not outgrow their autism. Rather, they find coping mechanisms and other strategies to be successful (Prince-Hughes, 2004). While literature is available, it is certainly not as prevalent as for primary grades. It is primarily linked to social development with some attention paid to cooperative learning methods. An expanded research base would serve students with autism spectrum disorders throughout their development.

Significant research is available on social skills development. While this is certainly critical to the social accomplishments of students with autism spectrum disorders, the cognitive domain is also important and often left unsupported. As the research proved, students with autism do have cognitive deficits often related to their social deficits (Bellon et al., 2000; Caring & Baron-Cohen, 2000; Losh & Capps, 2003). Little research has been conducted on this potential relationship. Extended exploration of such could illuminate strategies to support the whole child rather than one aspect at a time. Cooperative learning-teaching methods are an example of a relevant area, but they are only one example. The general education classroom is a mixture of academic and social experiences that could be better orchestrated with future research.

Finally, in many inclusive classrooms para-educators are influential in the success of students with disabilities. Little attention seems to be given to the influence of para-

educators versus other professional staff in the inclusion of students with autism. Since adults were found to be influential in the social status of students (Robertson et al., 2003), para-educators could have a critical role in the educational success of these students. The quality of support staff's work is critical to student achievement. Further research to support para-educators and additional support staff of students with autism spectrum disorders would greatly influence students' successful inclusion in general education settings.

While chapter three did reveal significant findings, there is a need for additional professional research. For teachers and professional support staff of students with autism spectrum disorders, specific training is necessary to fully support such students. In addition, increased research at the intermediate elementary level and research blending strategies for academic and social support are also critical. In all, significant increases have been made in research for students with autism spectrum disorders. However, given the trend of inclusion, general education teachers and students need additional support.

Conclusion

As the general education elementary classroom includes more students with autism spectrum disorders, teachers need to be competent and confident in their teaching. Students with autism need additional support in both cognitive and social domains; however, teachers do not always have the tools to meet those needs. Chapter four summarized current and recent research focused on supporting students in these domains. Given these research findings and their availability, teachers have particular responsibilities in fostering the development of students with autism spectrum disorders. There is still space for further investigation. The current trend toward inclusion

necessitates on-going research that will result in academic and social success for students with autism spectrum disorders in general education settings.

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