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Facilitating the Acquisition of Social Skills Through Service Learning

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COLLEGE OF EDUCATION

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Abstract

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MA, Pacific Lutheran University, 2005

BS, Pacific Lutheran University, 2003

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Deficits in communication affect individuals with autism regarding the ability to access a free and appropriate education as well as quality of life. This research study explored the effects of a service-learning project on acquisition of social skills and reduction of problem behaviors for students who have autism. The conceptual framework for this study was based on Maslow's theory of motivation and Erickson's 8 stages of personality development. A mixed-methods design with sequential transformative strategy was used to collect quantitative data from 5 elementary students who have autism during involvement in service learning; the Social Skills Improvement System was used and was analyzed using a *t* test. Qualitative data derived from field notes were coded and thematically analyzed. Although the differences were not statistically significant, the social skills did improve and the problem behaviors did decline. Qualitative data also supported the supposition that a positive change may have occurred and those students' basic needs were being met through leadership opportunities. Although the results of this study appear promising, the size of the study limits generalization and further research is needed. Service learning may be an effective intervention for individuals with autism spectrum disorder (ASD) allowing positive social change. Service learning may allow individuals with ASD to have their basic needs met; increase positive social interactions with others; help decrease unexpected behavior; and reduce stress and depression for themselves, their family members, and their educators.

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Section 1: Introduction to the Study

Introduction

The number of students with autism in the focus school district for this study has been steadily increasing. The first class created specifically for elementary students with autism opened 11 years ago. This class was designed to support students with classic autism. The following year, a class focusing on social skills was created for higher functioning elementary students on the autism spectrum. The focus district currently has three elementary classes designed to support students with classic autism, three elementary classes with a focus on social skills to support higher functioning students with autism, and one middle school classroom supporting students with classic autism. All of these classes are operating at maximum capacity. Due to limited funding, the district's focus is on intervention for elementary students with hope the students will acquire the social skills to be successful in the general education setting. Although the early interventions indicate students are attaining and demonstrating the desired social skills in a self-contained setting, they often have difficulty generalizing them into a general education setting. The increase in students on the autism spectrum is not unique to this school district. Statistics from the Autism and Developmental Disabilities Monitoring (ADDM) network indicate the prevalence of autism is steadily increasing. ADDM indicates in the year 2000, 1 in 150 children were identified with autism. In 2008, the number of children identified with autism was 1 in 88 (Baio, 2012). Interventions were originally designed for individuals with classic autism; however, the definition of

autism has expanded from classic autism to individuals with high intelligence, strong language skills, and a deficit in perspective taking (Frith, 2001). In 1943, Kanner published a widely received paper describing classic autism. (Frith, 2001). During the same time frame, Asperger was working with individuals who had many of the same characteristics as classic autism. However, the individuals in Asperger's case studies began speaking fluently and exhibited an interest in other people by age 5 years (Frith, 2001). They also demonstrated basic social skills, but remained egocentric and unable to maintain a reciprocal relationship (Frith, 2001). In 1944, Asperger published a paper documenting case studies, but the paper was ignored until the 1990s (Frith, 2001). As the definition of autism spectrum disorder expands, the variety of interventions must also be increased to support individual needs.

Autism is a neurological disorder with wide reaching effects touching not only the individual with autism spectrum disorder (ASD), but also their families and society. For the individual with autism, deficits in communication, social skills, and perspective taking occur. These deficits often cause individuals with autism to become frustrated. When frustrated, they may exhibit challenging behaviors including physical aggression, running away, verbal aggression, or stereotypical behavior (Dominick, Davis, Lainhart, Tager-Flusberg, & Folstein, 2007; Matson, Gonzalen, & Rivet, 2008). These behaviors significantly affect family members, peers, and school and community members (Eldar, Talmor, & Wolf-Zukerman, 2008). In addition to the emotional and physical effects, a significant financial effect occurs for families and society (Ganz, 2007). Most important,

autism significantly affects the quality of life of the individuals with the disorder (Strain, Schwartz, & Barton, 2011).

Problem Statement

During the last 11 years, the number of students in the focus school district who have autism has significantly increased. Eleven years ago, the district opened the first self-contained classroom designed to specifically address the needs of students with classic autism. The following year, a classroom designed to facilitate the acquisition of social skills of students in a self-contained setting and in the general education setting was created. Currently, the school district has six elementary classes and one middle school class providing support for students on the autism spectrum. All of the classes are operating at maximum capacity. Due to limited funding, the district focuses on implementing interventions such as applied behavior analysis and social thinking for elementary students in hopes they will acquire the social skills to be successful in the general education setting. Although the early interventions indicate students are attaining and demonstrating the desired social skills in a self-contained setting, they often have difficulty generalizing them into a general education setting.

Although applied behavior analysis and social thinking interventions are standard interventions for increasing social skills and reducing problem behaviors, these strategies have not provided enough support for our students to become successful in the general education setting. Applied behavior analysis and social thinking focus on changing specific behaviors. Another potential intervention is service learning. Limited research

indicates service learning addresses the whole child such as physical, intellectual, emotional, and social aspects. Although no research directly relates to increasing social skills and reducing problem behaviors with students on the autism spectrum, the service learning platform gives students an opportunity to generalize their social skills in a general education and/or community setting with facilitator support.

Nature of Study

A mixed-methods research design was used to collect both qualitative and quantitative data. The Social Skills Improvement System (SSIS) is a quantitative data collection instrument completed by parents and a speech pathologist. Qualitative data were composed of interviews and field notes. An in-depth discussion of the research design is found in Section 3.

Research Questions

The following research questions were used in the study:

1.   To what degree does a service learning project facilitate social skills improvement for students with autism?

2.   To what degree does a service learning project reduce problem behaviors in students with autism?

Purpose of Study

Interventions abound for individuals on the autism spectrum; some interventions include applied behavior analysis, cognitive behavior therapy, social skills training, and social thinking curriculum (Brunner & Seung, 2009). Each of these interventions focuses

on a specific characteristic of autism such as challenging behaviors or deficits in communication or social skills, as opposed to a holistic approach focusing on the whole child. Holistic interventions such as Developmental Individual Differences Relationship (DIR)-based and floor time are geared toward children ages 2 to 5 years. These interventions are designed to meet a young child's developmental needs: social emotional, communication, thinking and learning, motor skills, and body awareness (Ryan, Hughes, Katsiyannis, McDaniel, & Sprinkle, 2011). After reviewing the literature on these interventions, a question arose regarding whether a holistic approach may be used to facilitating the acquisition and generalization of social skills for elementary students on the autism spectrum. The purpose of the study was to determine whether participation in a service learning project influenced the acquisition of social skills and the reduction of problem behaviors for elementary students on the autism spectrum.

Conceptual Framework

Autism is like a ripple in water. The effect is far reaching. When a child on the autism spectrum is frustrated, he or she may become verbally aggressive, shouting obscenities or threats (Dominick et al., 2007; Matson et al., 2008), or physically aggressive by kicking, biting, scratching, or running away (Dominick et al., 2007; Matson et al., 2008). These behavioral outbursts have both emotional and physical effects on the individual with autism and on the family members, peers, school staff, and community members (Eldar et al., 2008). The ripple effect of autism also encompasses significant financial output for families and society (Ganz, 2007). Most important, autism

significantly affects the quality of life of the individuals with the disorder (Strain et al., 2011). Many of my students demonstrated leadership tendencies without the social skills to lead. Their attempts at leadership often resulted in frustration and a feeling of failure.

This study was based on Maslow's theory of motivation and Erickson's eight stages of personality development. Maslow, a psychologist interested in how people reach their potential, designed a hierarchy of needs; physiological security, social, esteem, and self-actualization (Maslow, 1970). Maslow's theory maintains a person's needs must be met on the first step of the hierarchy before he or she can move to the next step, and each step must be met in sequential order. Most individuals with autism have their physiological needs met; however, some individuals have difficulty getting their security needs met. Of course, family and community members work together to keep the individual out of harm's way, but the definition of security depends on individual perspective. For an individual with autism, security may mean environments free from loud noises, fragrances, fluorescent lights, and excessive stimulants impacting sensory processing (Lane, Dennis, & Geraghty, 2011).

The next level of the hierarchy, social needs, is challenging for most individuals on the autism spectrum. One of the characteristics of autism is a deficit in social skills (American Psychiatric Association, 2000). Difficulty communicating needs and desires results in frustration. The frustration in turn leads to challenging behaviors. Communication deficits can mean a lack of verbal communication or they can mean an inability to perspective take (Chafant, Rapee, & Carroll, 2007). In the book, *There's a*

Boy in Here: Emerging from the Bonds of Autism (Barron & Barron, 1992)*,* the author

explained the child's obsession with dead end streets. When riding in a car the child

would insist the driver go down each dead end street. When the driver did not comply

with the child's wishes, the child would have a tantrum. From Barron's perspective,

exploring a dead end street was an important activity because it indicated the child's

preferred interest was valued. When the driver did not respect the request to drive down a

dead end street, Barron extrapolated this to mean the preferred interest was not

appreciated and the child did not feel valued as a person (Barron & Barron, 1992).

Denying requests to drive down dead end streets damaged the child's sense of belonging,

acceptance, and love which are necessary to meet the social needs outlined in Maslow's

hierarchy. It also devalued the child's personal worth, an esteem need on the hierarchy.

If an individual on the autism spectrum is able to get his or her needs met on the

first three tiers of Maslow's (1970) hierarchy, the next step is esteem. Esteem is the final

step toward self-actualization. On this step, individuals need to develop personal worth

through self-actualization, social recognition, and authentic accomplishment (Maslow,

1970).

Erikson's Theory of Eight Stages of Personality Development is also developed

sequentially and each stage builds upon a prior stage (Batra, 2013). Each stage has the

potential for either great personal growth or great personal failure. Children ages 6 to 11

years are in the fourth stage of development known as Industry versus Inferiority. During

this stage, social interactions are important. Children develop a sense of pride and strive

to master new skills. If children receive support during this stage, they develop a sense of competence and belief in their skills. Without support, children feel they do not have the skills to be successful. This study proposed if students' social needs are met and they are given an opportunity to develop new skills and implement them in a service learning project, they will develop a sense of pride and will be motivated to master new skills. Having a positive sense of self-worth will facilitate their meeting social needs as defined by Maslow's hierarchy of needs and Erikson's Theory of Eight Stages of Personality Development.

Definitions

The following terms are used throughout the study:

Applied behavior analysis: An evidence-based practice using scientific methods to change behavior (Cooper, Heron, & Heward, 2007).

Autism: A neurological disorder affecting an individuals' communication and social skills (American Psychiatric Association, 2000).

Cognitive behavior therapy: A structured program integrating social thinking (Briers, 2009).

Service learning: A reciprocal relationship between students and the community (National Service-Learning Clearing House, 2011).

Social story: A story following a specific format and is used to teach social etiquette (Gray, 2010)

Social thinking: A term that describes the social thinking process encompassing how we interact with others, how we think about them and how they think about us (Winner, 2007).

Theory of mind: The ability to perspective take (Baron-Cohen, 1997).

Assumptions, Limitations, and Delimitations

I assumed participants would accurately document observations and answer the survey questions honestly. This study was limited by the specific experiences and expectations each participant brought to the study. Parents may have had a different perspective of their child's social skills and behavior than a paraeducator or speech pathologist. Delimitations include the small sample size and the short length of the study. All participants had direct contact with students with a diagnosis of autism. Data collection instruments were presumed to be valid, reliable, and credible in design. The Social Skills Improvement Scale implemented is a research-based survey. Parents and a speech pathologist completed the survey so information is limited to their responses.

Significance of the Study

I am a special education teacher in a self-contained classroom designed with a focus on social skills. The majority of my students are on the autism spectrum. I chose an environmental science service learning project as the intervention tool for the study. Environmental science is an area of high interest to my students. Environmental science also offers long-range employment opportunities for students in outdoor settings and do not require a high level of social skills. Service learning is a reciprocal pursuit integrating

meaningful community service with instruction and reflection (National Service learning Clearinghouse, 2011).

For the purposes of this study, students received instruction from the Growing Up Wild curriculum. The students then worked with partners or small groups to teach lessons learned to preschool and/or kindergarten students in the general education setting. Reflection facilitated students honing their presentations for subsequent classes. The structured setting and lessons from Growing Up Wild created a safe setting for students to refine their social skills. Successful implementation of the service learning project gave students a sense of belonging, social recognition, and a feeling of accomplishment.

Although service learning is accepted as a valuable teaching tool among many educators, little research supports it. The literature suggests a need for additional research to determine how students with special needs can achieve general education and/or individualized education program (IEP) goals through service learning projects (Dymond, Renzaglia, & Slagor, 2010). This study brought awareness of using authentic academic and social experiences to enhance curricula. It also served as a talking point for teachers as well as administrators at district, state, and national levels.

Quality of life is also an area of concern for individuals on the autism spectrum. They need to be able to participate in family, school, and community activities (Strain et al., 2011). Service learning projects nurture whole child development such as physical, intellectual, emotional, and social areas. Nurturing the whole child provides support so each individual can have needs met to advance to the next level of the hierarchy.

Summary

For individuals to realize their maximum potential, their developmental needs must be met. Current interventions for individuals with autism focus on specific skills as opposed to a holistic approach. Service learning projects provide a platform for students to generalize social skills learned in the self-contained setting. Through this experience, they attained social skills needed to continue to the next developmental level, as well as the ability to generalize social skills to increase their quality of life. Findings of this study generated conversation among educators and administrators at the district level. I will continue to promote conversations at the state and national levels once my research is published. Providing holistic interventions increased individuals' quality of life and promoted social change. Section 2 will provide an in-depth discussion of the literature consisting of an overview of autism, the etiology, effects on society, interventions, and service learning. Section 3 includes the research design and approach, setting and sample, data analysis, and validation procedure.

Section 2: Literature Review

Introduction

The literature review provides an overview of autism from an educational, medical, and societal perspective. It is organized sequentially starting with etiology and following with theory of mind, effects on society, interventions, and service learning. Sources for the literature review are composed of peer-reviewed journals as well as seminal works. Research articles were identified using ERIC, Education Research Complete, and Education from Sage using keywords: *autism*, *Asperger syndrome*, *applied behavior analysis*, *cognitive behavior therapy*, *cognitive behavior intervention*, *social stories*, *social thinking*, *theory of mind*, *brain research-autism*, *service learning*, *quality of life – autism*, and *impact of autism*. The seminal works lay the foundation for current research.

Range, field, variety, gamut, scale, and continuum are synonyms for spectrum. These words give significance to ASD and remind us it is a spectrum disorder. ASD is a continuum and individuals on the spectrum range from low functioning to high functioning. Early interventions focused on classic autism, which refers to severely affected individuals. As understanding of autism has evolved to include a wide range of abilities, it is imperative to develop interventions to meet individual needs.

The American Psychiatric Association's *Diagnostic and Statistical Manual-IV, Text Revision IV-TR* (American Psychiatric Association, 2000) indicates individuals on the autism spectrum have deficits in social interaction and communication, as well as

restricted repetitive and stereotyped patterns of behavior, interests, and activities. These deficits affect the quality of life individuals on the autism spectrum experience. Optimally, individuals would have the ability to participate in family, school, and community activities (Strain et al., 2011). The Centers for Disease Control estimate 1 in 88 children have been identified with ASD (Centers for Disease Control, 2012). The number of individuals affected by ASD has led to research being conducted to understand the etiology as well as interventions to increase the quality of life of individuals with ASD. To provide support to individuals on the autism spectrum, it is imperative to have a thorough understanding of the research regarding the etiology of ASD, the effects the condition has on individuals and society, and the implementation of interventions.

Etiology

Although many theories exist regarding what causes autism, researchers agree it is a neurological disorder. Through the use of Magnetic Resonance Imaging (MRI) researchers have discovered the areas of the brain affected by autism. Individuals on the autism spectrum have an excess of neurons in the frontal and cortical regions affecting their socioemotional and communication characteristics (Courchesne et al., 2007). The medial prefrontal cortex and anterior angulate parts of the brain work together to facilitate social interactions (Meguid et al., 2010). The medial prefrontal cortex processes perspective taking and how one individual relates to another while the anterior angulate processes emotion recognition (Meguid at. el., 2010). When excess neurons cause a

disconnect between the prefrontal cortex and anterior angulate, it affects an individual's ability to perspective take and communicate.

Theory of Mind

A student is standing by a fish tank while talking on the phone with his mother. His mother is explaining she is unable to pick him up from school and he will have to ride the bus home. The fish have just been fed and are eating aggressively. The student interrupts his mother to ask if she sees the fish eating. He does not understand about other people having minds and believes his mother is thinking about the same thing he is. This boy's autism affects his ability to perspective take. *ToM* is a term coined to describe an individual's inability to perspective take (Premack & Woodruff, 1978). Although *ToM* is not listed as a characteristic of autism in the *Diagnostic and Statistical Manual-IV, Text Revision IV-TR*, the incidence of occurrence is greater for individuals who have autism than in individuals who have other disabilities or those who are typically developing (Baron-Cohen, Leslie, & Frith, 1986; Buijsen, Hendrika, Ketelaars, & Verhoeven, 2011; Lind & Bowler, 2010). This deficit affects referential communication. Referential communication affects an individual's ability to give/follow directions, ask questions, and make explanations (Dahlgren & Sandberg, 2008). The prefrontal regions of the brain that are neurologically affected by autism are critical for *ToM*. This area of the brain facilitates understanding of abstract concepts such as thinking, knowing, dreaming, pretending, and hoping (Baron-Cohen, Tager-Flusberg, & Cohen, 2000). Individuals who

have autism are unable to attribute these kinds of thoughts to others (Baron-Cohen & Frith, 1986).

Effects on Society

ASD is a spectrum disorder and the range of implications is vast. Each individual is unique, but many of them display atypical eating behavior, abnormal sleep patterns, temper tantrums, self-injurious behavior, aggressiveness, anxiety, and depression (Dominick et al., 2007; Meyer, Mundy, Van Hecke, & Durocher, 2006; Strang et al., 2012; Farrugia & Hudson, 2006). The effects of autism have a substantial impact on family members as well. Siblings are often responsible for caring for their family member and managing aggressive behaviors. This responsibility may extend for the rest of their lives. Caring for an individual on the autism spectrum is expensive and may financially drain a family's financial resources. This often leads to depression for siblings as well as parents (Dillenburger, 2011; Farrugia & Hudson, 2006; Meyer, Mundy, Van Hecke, & Durocher, 2006; Orsmond & Delzer, 2009; Smith & Elder, 2010; Strang et al., 2012)

As the effects of autism are unique to each individual, so are the ways individuals affect the education system. Research suggests students with high functioning autism benefit from peer models in the general education setting, but the inability to regulate their behavior often leads educators to retain them in a self-contained setting (Sansosti & Sansosti, 2012). Many students on the autism spectrum present a complex set of needs requiring multiple intervention strategies (Kasari & Smith, 2013). Interventions may potentially be intensive, complicated to deliver, and expensive (Kasari & Smith, 2013).

For maximum success, all school staff should receive professional development in strategies for working with students on the autism spectrum (McDougall, Servais, & Meyer, 2009). The rise in the rate of autism has had a significant impact on education. The impact to education is financial as well as social/emotional. The average cost for educating each student from the age of 6 through 21 years is $150,483 (Ganz, 2007). Individuals on the autism spectrum require a structured setting with flexibility to meet individual needs (Darretxe & Sepulveda, 2011). Teachers need training to create an optimal learning environment for individuals with ASD, as well as resources to acquire items to support the learning environment. Students who are on the autism spectrum have a deficit in interaction and communication. These deficits may trigger unexpected behaviors. Students with ASD who are included in the general education setting often times exhibit physically aggressive behavior, have difficulty with flexibility when changes in the schedule occur, a disregard for following instructions, and display stereotypical behavior (Eldar et al., 2008). These unexpected behaviors affect the social/emotional well-being of peers in the general education setting and may lead to burnout (Reiter & Vitani, 2007).

Autism has a significant impact on society as a whole. It is recommended individuals participate in early intervention programs, have access to services regardless of socioeconomics, and continued support for individuals throughout their lives (Strain et al., 2011). Most individuals on the autism spectrum have significant deficits in social skills. This deficit impacts their ability to seek, obtain, and retain jobs. They often need

supported work providing transitional community-based employment training. The

lifetime cost of supported work for an individual is estimated at $19,349 (Ganz, 2007).

The work force may also be affected by parents who miss time at work, work decreased

hours, or substitute a lower paying job having flexibility or leave the work force

completely in order to care for their child who has ASD (Ganz, 2007). The lifetime costs

of autism also includes direct medical costs such as physicians, dental, drugs, and

behavioral therapies as well as direct nonmedical costs such as childcare, adult care, and

respite care (Ganz, 2007). The magnitude of individuals who have autism and the effect

they have on society has prompted a plethora of intervention strategies.

Interventions

Applied Behavior Analysis (ABA) is a scientific approach to understanding

behavior and creating interventions. Intervention strategies include priming, self-control,

positive reinforcement for desirable behavior plus punishment for undesirable behavior,

and presenting preferential activities or reinforcers (Ma, 2009). Lovaas used discrete trial

teaching (DTT) with reinforcement to motivate children with autism to want to learn and

then generalize the learned skills by providing opportunities to practice their newly

acquired skills in a variety of settings while providing frequent reinforcement (Blake,

2011). ABA is the only social skills intervention with data supporting an increase in

positive behavior (Schreiber, 2011); however, Strain and Schwartz (2001) described

social behavior as "complicated, dynamic, culturally influenced, and contextually

biased." These dynamics cannot be addressed through a social skills based curriculum

(Strain & Schwartz, 2001).

Cognitive Behavioral Therapy (CBT) is another strategy individuals with autism

may benefit from. It provides an extremely structured format that integrates social

thinking and increases an understanding of how individuals think, feel, and act affect

each other (Donoghue, Stallard, & Kucia, 2010). An example of a visual support used to

support cognitive thinking could be a thermometer used to help an individual understand

how they feel and provide strategies to help them regulate their behavior (Attwood,

2008). Social skills instruction implemented in a group setting with typically developing

peers has shown some success with young children (White, Koenig, & Scahill, 2010).

Children in this study were ages 3 to 7 years and practiced skills such as appropriate

greetings, cheering for a friend, and sharing artwork with their teacher. The natural

learning environment and access to typically developing peers reinforced the social skills

learned and increased the degree of generalization to other settings (White et al., 2010);

however, a study implementing social skills group instruction with adolescents with

typically developing peers acting as peer tutors indicated that although participants

showed improvement in the social skills group setting, teachers indicated no significant

changes, and parents indicated the skills learned were not consistently maintained. The

literature suggests cognitive behavioral therapy is an effective intervention when taught

in isolation; however, there is no evidence it generalizes into real world settings

(Schreiber, 2011). The UCLA PEERS program indicates a structured approach to social

skills group intervention must be implemented with a parent education component designed to assist parents in acting as social skills coaches in order to increase the use of desired social skills to be generalized and maintained with parent support (Laugeson, Frankel, Gantman, Dillon, & Mogil, 2011). An earlier study supported the use of parent education to assist with generalization (Sofronoff, Attwood, Hinton, & Levin, 2007). In this study, adolescents participated in a highly structured group focused on identifying feelings and anger management tools while parents attended a support group to gain knowledge of the strategies their child was using and become familiar with a common language shared with teachers. Results of the study indicated having a common language allowed increased discussions about feelings and increased the implementation of self-regulation tools. (Sofronoff et al., 2007).

Socio-dramatic affective relational intervention (SDARI) is a performance-based social skills curriculum (Lerner & Mikami, 2012). SDARI uses game-based instructional activities to build on existing social skills (Lerner & Mikami, 2012). A study comparing social skills focusing on social knowledge and SDARI found participants in the SDARI group interacted with the other participants more during the initial session than participants in the social knowledge group; however, over time, interaction during the social knowledge group increased while interaction in the SDARI group decreased (Lerner & Mikami, 2012). Although the literature is divided on the generalization of CBT, it is strongly recommended in the clinical and school setting for reducing anxiety and problem behaviors as well as increasing TOM and problem solving skills (Lemmon,

2013; Rotherhanm-Fuller & MacMullen, 2011; Stichter, O'Connor, Herzog, Lierheimer, & McGhee, 2012; Sung et al., 2011).

Social stories are an intervention that uses a visual aid to facilitate understanding of how a person's behavior affects others. It also offers suggestions of how to modify behavior to increase the positive social interactions. A study of six dissertations suggests the results of using social stories may be significant (Karkhanen et al., 2010). Schreiber (2011) suggested social stories may be an effective intervention used to decrease negative social behaviors and increase positive ones. Additional research suggests social stories are more effective in reducing unexpected behavior than in promoting social skills (Hudock, Kashima-Ellingson, & Bellini, 2011). Evidence indicates social stories are most effective when a functional behavior analysis (FBA) is used to inform the intervention; the intervention targets simple behaviors as opposed to a complex chain of behaviors; the social story is read immediately prior to a target situation; and the social story is personalized for the student; however, there is no evidence the behaviors are maintained or generalized (Karkhanen et al., 2010; Schreiber, 2011).

The power card strategy is similar to a social story but uses a child's interest in super heroes to develop a card with a hero demonstrating expected behavior (Campbell & Tincani, 2011). Power cards have been used effectively to remind students of expected behaviors prior to targeted situations, but there is no evidence of maintenance or generalization (Campbell & Tincani, 2011). Technology has also been used to present social stories and video modeling. The use of technology has been effective in increasing

social communication skills of children with high functioning autism (Sansosti & Powell-Smith, 2008). A limited amount of evidence suggests skills learned using computer presented social stories and video modeling are maintained, but there is limited generalization (Sansosti & Powell-Smith, 2008). Ozdemir (2008) concurred with Sansosti and Powell-Smith. A small study using computers to present social stories prior to play increased the duration of appropriate social engagement and suggests some generalization. A review of 31 peer reviewed research articles indicates video modeling is also an effective strategy for teaching social skills, play skills, communication skills, functional skills, self-care skills, and daily life skills (Acar & Diken, 2012).

The concept of teaching "social thinking" is a relatively new concept introduced by Garcia-Winner (2007). Traditional social skills' training addresses specific skills such as greeting guests. For example, an individual may be coached to open the front door when they hear the doorbell ring, say hello, and offer to take the guest's coat. This greeting is appropriate during cold weather, but is out of place on a hot summer day (Vermeulen, 2012). The ability to differentiate greetings is easily assimilated by young children without having been explicitly taught. However, individuals who have autism perceive faces in a piecemeal fashion and rely less on facial cues to interpret social interactions (Neiworth, 2009). Social thinking lessons are designed to facilitate an individual analyzing their own behaviors and the impact their behaviors have on how others perceive them using visual aids. Although the research surrounding "social thinking" is limited, it suggests "social thinking" increases positive or expected behavior

(Crooke, Hendrix, & Rachman, 2007). Social skills group interventions integrating role-play provide an opportunity for individuals with ASD to practice social interactions. As individuals gain experience in social settings, their confidence increases (Tse, Strulovitch, Tagalakis, Meng, & Fombonne, 2007). Social thinking is also an essential component of critical and metacognitive thinking (Lazzara et al., 2009). Concept mapping, real world experiences, and thought provoking questions are strategies used to increase abstract thinking skills (Lazzara et al., 2009).

Researchers have been conducting experimental behavior analysis since Skinner published his book about operant conditioning in 1938. As the incidence of autism began to rise in the early 1960s, researchers implemented applied behavior analysis to increase social, communication, and academic achievement for individuals who have autism. Behavior analysis has abundant research documenting its success as an intervention for individuals on the autism spectrum. In fact, Schreiber noted ABA is the only research-based social skills intervention for individuals who have autism (2011). ABA also aligns with the Individuals With Disabilities Education Act (IDEA). IDEA recommends the implementation of a functional behavioral analysis (FBA) to determine the antecedents and consequences of unexpected behaviors (Lovitt, 2012). FBA's are an integral component of ABA. Proponents of social stories and social thinking assert due to the recent implementation of these interventions over the past 20 years, researchers have not had an opportunity to compile the wealth of research-based data ABA has accumulated; however, initial studies show these interventions have promise and need further studies

that include larger sample sizes and replication (Schreiber, 2011). Fifty years ago, the emphasis was on acquiring life skills and academic skills (Gerhardt & Garcia-Winner, 2012). ABA proved to be an effective tool and society recognized individuals with ASD had skills that would enable them to be contributing members of society. As the prevalence of autism increased and the number of individuals were integrated into society, expectations for social interactions also increased. ABA did not meet the demands of the new expectations and social thinking emerged (Gerhardt & Garcia-Winner, 2012). At one time, ABA and "social thinking" were considered separate entities and never the two shall meet. In recent years, they have combined forces to provide an array of interventions to meet the individual needs of individuals who autism while collecting data to assess the effect of the intervention. Now, it is time to look towards the next step for facilitating "social thinking" that will facilitate individuals with ASD becoming contributing members of society (Gerhardt & Garcia-Winner, 2012). Thompson (2013) concurred with Gerhardt and Garcia-Winner (2012). Sometimes interventions can be as simple as providing opportunities for individuals on the autism spectrum to interact with peers who share their perseverative interest (Koegel et al., 2012).

Service Learning

Service learning is a reciprocal relationship between students and the community. The community provides educational and/or training opportunities for students. In return students reciprocate by using the information gleaned to perform community service.

This model comprises many of the components offered in the Oakstone Challenge. The Oakstone Challenge is a program implementing intervention strategies with real life experiences (Morrison & Blackburn, 2008). Peer participation, team building, and community service facilitate generalizing social interactions into community settings. This model gives students an opportunity to acquire social competency while community members learn to exercise tolerance and demonstrate acceptance of a diverse population (Morrison & Blackburn, 2008). Service learning has also been implemented to increase critical thinking, recognize civic responsibility, and increase the ability to assign tasks and complete individual duties. These goals were addressed in an elementary school setting where each participating class was assigned the task of completing three service learning projects: one in the school setting, one in the community setting, and one in the global setting. Results of the project indicate students achieved growth in personal-social development (Steen et al., 2012). Research is limited, but suggests students who participate in service learning projects exhibited increase motivation, demonstrated empathy for peers, made connections from classroom lessons to the real world, and increased their social skills and self-confidence (Olnes, 2008).

Teachers have embraced service learning as an educational model for increasing academic achievement, an awareness of social justice for individuals with special needs, as well as for their typically developing peers; however, there is little evidence supporting these claims (Dymond et al., 2010). Another area of concern regarding the affect service learning has on academic achievement and awareness of social justice is the manner in

which the service learning project is implemented. Although service learning has

guidelines, the implementation can be ambiguous. Results of the project depend upon the

amount of rigor the teacher approaches it with. The type of project, amount of time

allocated for class discussions, and the support provided for reflections impacts the

effectiveness of the project (Levesque-Bristol, Knapp, & Fisher, 2010). There is also a

lack of evidence indicating social skills learned during service learning projects

generalize into a setting of typical peers for an extended length of time. Some research

indicates although social interaction between individuals with and without special needs

increases during implementation of the project there is no evidence the social interactions

develop into friendships (Storey, 2004).

Research Methodology

Understanding social phenomena such as the impact a service learning project has

on increasing social skills and decreasing problem behaviors for individuals with autism

cries for a qualitative research method. These questions are complex and cannot be

answered with a simple yes or no. Qualitative methodologies such as in-depth

observational notes provide a deep understanding of the participants and their

experiences (Lodico, Spaulding, & Voegtle, 2010). The sampling for this research

inquiry is small. Qualitative research is designed for case studies and small samplings.

Qualitative researchers use inductive reasoning to look for patterns and develop a theory

(Creswell, 2009); however, qualitative research is not generalizable to other populations.

Using a quantitative approach, such as implementing a survey specifying the type of

information collected and conducting a statistical analysis, increases the possibility of generalizing from a sample to a greater population (Creswell, 2009). Combining qualitative and quantitative methodology in a mixed-methods design combines the best of both worlds and increases the strength of the study. Qualitative research collects data that may be lost in quantitative research methodologies implementing yes/no questions. It provides an understanding of the numbers generated in the quantitative data. A *t* test was used to analyze quantitative data. Each of the participants brought a different perspective to this study. Therefore, the raw data compiled from the survey does not provide an accurate comparison. A *t* test indicates if a change occurs between pre-treatment data and post treatment data for each participant. The results of the *t* test were used for comparison.

Summary

The literature indicates the number of individuals on the autism spectrum is rising (Baio, 2012) and the effects on society are increasing (Ganz, 2007). An increasing number of interventions are available to facilitate an increase in academic achievement, social competency, and emotion regulation specifically for students with autism; however, many of these interventions are expensive both in price and the amount of time required to implement them (Kasari & Smith, 2013). Service learning is a low cost intervention embraced by teachers, but there is limited research supporting the use of service learning to facilitate social skills for special education students (Dymond et al.,

2010). In Section 3, a mixed-methods research design studied the impact of service

learning on the social skills of students with autism is presented.

Section 3: Research Method

Introduction

The purpose of this mixed-methods study was to determine the degree to which a service learning project facilitated increasing social skills and reducing problem behaviors for elementary students on the autism spectrum. A mixed-methods design was the most effective research method for this study as it provided qualitative data to increase an understanding of the participants and their experiences (Lodico et al., 2010), as well as quantitative data that increased the possibility of generalization to a larger population (Creswell, 2009). The study was approved by Walden University's Institutional Review Board, approval number 03-11-15-0177928. The scope of the project necessitated obtainment of a partner data use agreement from the school district, and analysis of data collected in multiple settings, including in a general education setting, a self-contained classroom setting, and at home. For the purposes of this study, the SSIS (Gresham & Elliott, 2008) provided quantitative data. The SSIS is a universal screener designed to collect information about social skills and problem behaviors from educators as well as parents. Qualitative data consisted of field notes and scatter plots collected from paraeducators and a speech language pathologist during the service learning project, as well as throughout the day as part of their regular job duties.

Research Design and Approach

A mixed-methods design combines the best of both qualitative and quantitative data (Creswell, 2008; Terrell, 2012). Quantitative research uses a deductive approach

using an experimental design (Christ, 2013). I proposed a hypothesis, tested the

hypothesis, and analyzed the data to determine if there were significant findings when a

variable was introduced and/or changed. Qualitative research used an inductive approach

on the premise every person's reality is unique (Christ, 2013). The researcher and

participants developed a relationship and worked together on the research project. Today,

many social scientists have concluded quantitative and qualitative research can be

combined to study problems in a variety of areas such as education and sociology

(Terrell, 2012). The strength of one design offsets the weakness of the other design

(Tillman, Clemence, & Stevens, 2011). Using both quantitative and qualitative methods

strengthened the findings of the study.

A sequential transformative strategy was implemented for data analysis. First, a

baseline assessment was completed using the SSIS. Next qualitative data were collected

during the service learning project, and finally a post-SSIS assessment was administered.

Sequential transformative data collection gave equal priority to both quantitative data and

qualitative data with data integrated during interpretation (Terrell, 2012). The SSIS was

used to provide quantitative data. The closed question format of the SSIS provided exact

information required for this study. The SSIS rating scale also alleviated interview bias

and increased validity. The SSIS was completed by parents and a speech language

pathologist prior to the implementation of the service learning project and served as a

baseline for data of existing social skills and problem behaviors. Next, the service

learning project was implemented and supervised by the community partner.

Paraeducators and a speech language pathologist used field notes to collect qualitative data in the general education setting during the implementation of the service learning project, as well as the special education self-contained setting. Field notes taken by the paraeducator and speech pathologist provided examples of social skills and problem behaviors exhibited during the service learning project. As soon as the service learning project was completed, parents and a speech language pathologist completed the follow-up SSIS evaluation.

A *t* test was used to determine whether there was a change in the frequency of social skills used or problem behaviors. In addition to rating social skills and problem behaviors, the SSIS included a rating scale to determine the importance of each social skill or problem behavior. This scale was used to rate the importance of the qualitative data collected. As the researcher for this study, I analyzed the data I received from the school upon completion of the post SSIS. Both quantitative and qualitative data were coded to determine whether evidence supported a theme. Triangulation was used to compare quantitative data and qualitative data, thus increasing the accuracy of the study (Creswell, 2008).

<div align="center">**Setting and Sample**</div>

Sample

A purposeful sampling with a homogenous strategy was used. This strategy was appropriate as I focused on the acquisition of social skills and reduction of problem behaviors for students on the autism spectrum. Purposeful sampling is a qualitative tool

used to focus on specific sites or participants (Creswell, 2008). A purposeful sampling

that focuses on individuals who have significant information about the research topic is

called a homogeneous strategy (Lodico et al., 2010). Participants consisted of five

students from a program designed to facilitate the acquisition of social skills for students

on the autism spectrum. The students were all male and had a diagnosis of autism,

Asperger syndrome, or pervasive developmental disorder – not otherwise specified. They

ranged in age from 5 to 10 years old. One of the five students participated in the free and

reduced lunch program.

Setting

The program studied was located in a rural elementary school serving 680

students and had 50% free or reduced lunch. The sampling was drawn from data provided

by nine parents, one paraeducator, and one speech language pathologist who had

relationships with students from the class diagnosed with autism spectrum disorder,

Asperger syndrome, or pervasive developmental disorder – not otherwise specified

(PDD-NOS) and had a deficit in the area of social/emotional and/or social

communication on their Individualized Education Program (IEP). Data provided by the

community partner were used to better understand the problem and answer research

questions.

A Partners Use of Data Agreement was arranged with the school district. Data

received from the school is stored as a data file on my personal computer that is protected

by a password and kept in a locked location. The research partners were asked to ensure

accuracy of data using member checks before sending it to the researcher. Upon completion of the data collection, code numbers and direct identifiers were removed. The data will be stored for at least 5 years.

Measures Taken for Protection of Participants' Rights

This study did not directly involve interaction with human participants; I analyzed secondary data. However, to minimize risks and protect participants and stakeholders, only de-identified data were sought in order to provide anonymity and privacy of participants. I have completed training through the National Institutes of Health and followed all procedures while conducting this study.

Details of the Treatment by Community Partner

All students in the focus class received instruction from Growing Up Wild curriculum and participated in an environmental service learning project. Service learning is a reciprocal relationship where students receive training and then implement the training into a community setting, thus providing a community service while increasing their own learning (National Service-Learning Clearinghouse, 2011). After receiving instruction in Growing Up Wild, my students used this knowledge to prepare environmental presentations for preschool and/or kindergarten students, consequently increasing their ability to meet requirements for presentation of knowledge and ideas in the common core standards, and the preschool and/or kindergarten students worked on their environmental science standards. Growing Up Wild is aligned with standards from the National Association of Education for Young Children (NAEYC) and is aimed at

students 3 to 8 years old. The curriculum provided hands on lessons giving students an

opportunity to explore outdoors and interact with nature within a school setting. After

mastering the curriculum, my students were placed in small groups of 3 or 4 students per

group. They worked together to determine individual roles during the presentation and

had an opportunity to practice their presentation prior to presenting the lessons to

preschool and kindergarten classes within our school. After each presentation, students

reflected on the experience and discussed any changes they wanted to make for future

presentations. Each student presented a minimum of four lessons. There were two

observers collecting data during each presentation to establish inter-observer reliability.

Data Analysis and Validation Procedure

I requested quantitative data in the form of the SSIS and qualitative data, such as

field notes and scatterplots, for the students in my class from the school district upon

completion of an environmental service learning project. I also requested data from the

Social Thinking – Social Communication Profile. The SSIS indicates how often social

skills and problem behavior occur (never, seldom, often, almost always). This instrument

has high internal consistency and moderately high validity. A comparison of the Social

Skills Rating System (SSRS) and the SSIS was conducted nationwide with a sample of

4,700 children and adolescents. Results for the SSIS indicated the median scale for

reliability in the social skills and problem behaviors is in the .90s. The median subscales

on the teacher form and parent form are in the mid .80s. (Gresham, Elliott, Vance, &

Cook, 2011). Quantitative data collected from the SSIS were analyzed by this researcher

using a *t* test to determine whether there is a change in the frequency of social skills and problem behaviors between the pre-experience data collection and the final. Field notes were typed and returned to participants to verify accuracy. I coded qualitative data obtained through field notes to determine whether there was evidence to support a theme. Quantitative and qualitative data were triangulated to identify patterns of convergence and divergence. Triangulation of data increased validity of the findings (Creswell, 2008; Tillman et al., 2011).

Data were also analyzed by the researcher using the Social Thinking-Social Communication Profile, a component of the school district's social thinking curriculum, completed by the speech language pathologist. The Social Thinking-Social Communication Profile describes different levels of social communicators such as significantly challenged social communicators, challenged social communicators, emerging social communicators, nuance challenged social communicators such as weak interactive and socially anxious behaviors, resistant social communicators, and neurotypical social communicators (Winner, 2014). The Social Thinking-Social Communication Profile was used to determine whether the level of social functioning impacted the effect service learning had on the acquisition of social skills. Research partners were asked to use member checks to ensure the accuracy of data prior to sending them to the researcher. Data will be stored electronically on my personal computer for 5 years (Creswell, 2009).

Summary

A mixed-methods research design was used to analyze the effects of an environmental service learning project on the acquisition of social skills and decrease of problem behaviors for students on the autism spectrum. Data from the service learning project were provided by the school district. Quantitative data were collected from parents and a speech pathologist using the SSIS. Qualitative data collected by a paraeducator and speech language pathologist were gathered while students implemented the service learning project in addition to data collected during the rest of the school day. The SSIS was used as a pre/post survey and was analyzed using a *t* test. Quantitative data were coded to identify patterns of behavior such as initiating social interactions, empathy, conflict resolution, and emotion regulation. Quantitative and qualitative data were triangulated to determine if there were corresponding themes.

Section 4: Results

Introduction

The purpose of this sequential transformative study was to determine whether an environmental service learning project could be an effective intervention to facilitate social skills and reduce problem behaviors for students with autism. A mixed-methods research methodology was explicitly chosen to provide an opportunity for an in-depth study and to increase the likelihood of generalization to a larger study. Social skills and problem behaviors are multifaceted and individual perceptions of them can be subjective. Quantitative data collected through a survey using a fixed set of questions increases the possibility of generalization to a larger population (Creswell, 2009). However, the survey is interpreted through the lens of the person completing it. Detailed observational notes provide a deeper understanding of the participants and their experiences (Lodico et al., 2010). Observational notes can provide evidence of patterns as well as support for quantitative data. A mixed-methods methodology provided the data required to understand the effect an environmental service learning project had on the acquisition of social skills and the reduction of problem behaviors.

Data Collection Process

The focus school district provided quantitative data consisting of the SSIS (Gresham & Elliott, 2008) completed by the parents of four of the five students (Subjects 2, 3, 4, and 5) and a speech language pathologist who worked with the five students in a school setting, as well as qualitative data in the form of field notes taken by the speech

pathologist and a paraeducator during the eight lessons. Six students participated in the service learning project, but SSIS forms were fully completed for only five of the students. The number of missing items was exceeded on one of the SSIS forms. Therefore, only five subjects are represented in this study.

Recorders who provided observations during the service learning project were instructed to describe the following: setting, activities, participants and their roles, and exact quotes while observing through a lens looking at social skills and problem behaviors. Participating parents and a speech language pathologist completed a SSIS survey prior to the service learning project to establish quantitative data as a baseline, and after the service learning project to ascertain ending data. The speech language pathologist provided services to the subjects in this study using a push in model in the self-contained setting as well as a pull out model in the speech room. The speech pathologist also observed the students in the school wide setting. The speech language pathologist completed the SSIS using information acquired in all three settings: self-contained classroom, speech room, and school wide. A sequential transformative strategy was implemented to collect and analyze data. Quantitative and qualitative data were assigned equal weight and were integrated during analysis (Terrell, 2012). A *t* test was performed to analyze the quantitative data using the SPSS Statistics program to identify whether the means between before and after data were statistically significant.

Field notes provided by the speech language pathologist and paraeducator were typed and member checked (Lodico et al., 2010). I organized the notes into tables by

student and sorted into the following social skills categories defined by SSIS: communication, cooperation, assertion, responsibility, empathy, engagement and self-control. Data from the SSIS collected for individual subjects were broken down into the social skills categories listed previously. I then entered the data into an excel spreadsheet to create a histogram illustrating each subject's social skills. The social skills histogram for each subject was compared to his or her individual field notes to determine whether a pattern of behavior existed.

A similar process was used to analyze problem behaviors. The SSIS breaks down problem behaviors into the following categories; externalizing, bullying, hyperactivity/inattention, and autism spectrum. A table was created to organize field notes pertaining to individual subject's problem behaviors in the above categories. Scores from the SSIS were entered into an excel spreadsheet, and a histogram was created to illustrate levels of problem behaviors for individual subjects. Results are discussed in four sections: Social Skills Quantitative, Social Skills Qualitative, Problem Behaviors Quantitative, and Problem Behaviors Qualitative.

Service Learning Project

Five students who have autism participated in an environmental service learning project in collaboration with the schools' Early Childhood Education and Assistance Program (ECEAP). The five students represented a wide range of ages and social communication levels. To obtain a better understanding of the student's social communication levels, the speech language pathologist completed a Social Thinking –

Social Communication Profile for each student. Social communication levels ranged from significantly challenged social communicator to nuanced challenged/socially anxious communicator. Baseline data from the SSIS also indicated the students had a vast array of social skills (Table 1).

Table 1

SSIS Student Profile: Baseline Social Skills

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Communication	Average	Average	Average	Average	Below average
Cooperation	Average	Average	Average	Average	Below average
Assertion	Average	Average	Average	Average	Below average
Responsibility	Average	Average	Average	Average	Below average
Empathy	Average	Average	Below average	Below average	Below Average
Engagement	Average	Average	Average	Below average	Below average
Self-Control	Average	Average	Below average	Below average	Below Average

Participating students were members of a class designed to focus on social skills (FOSS). The FOSS class participated in service learning through collaboration with community partners to learn about environmental science and perform community

service such as raising salmon in the classroom, restoration projects, nature mapping, and salmon carcass tossing. Using the knowledge learned from these service learning experiences, participating students extended their community service by bringing environmental science activities to a preschool classroom.

The participating students met as a group and voted to use lessons from *Growing Up Wild* (Council For Environmental Education, 2011) to generate four lessons for typically developing preschool students. The lessons from *Growing Up Wild* had many components, and students chose which components to implement in the service learning project. The lessons were presented on four consecutive Thursdays during a morning preschool class, as well as an afternoon preschool class, giving students an opportunity to participate in a maximum of eight lessons (Table 2).

Table 2
Preschool Service Learning

Date/time	Large group activity	Small group activity(s)
February 26, 2015 10:24 a.m. – 11:03 a.m.	Theme: Fishing Read aloud: *Gone Fishing* by Earlene Long Group leader: Subject 2	1.Fishing station 2. Goldfish cracker sort/graph 3. Habitat puzzle
February 26, 2015 1:24 p.m. – 2:06 p.m.	Theme: Fishing Read aloud: *Gone Fishing* by Earlene Long Group leader: Subject 3	Habitat Puzzle (3 groups)
March 5, 2015 10:25 a.m. – 11:05 a.m.	Theme: Spiders Readers theater: *The Very Busy Spider* All attending subjects participated	Weave a spider web using template from *Growing Up Wild*

(table continues)

March 5, 2015 1:15 p.m. – 1:45 p.m.	Theme: Spiders Readers theater: *The Very Busy Spider* All attending subjects participated	Weave a spider web using template from *Growing Up Wild*
March 12, 2015 10:36 a.m. – 11:15 a.m.	Theme: Worms Worm poem (*Growing Up Wild*) Group leader: Subject 2	Worm lab (students measured worms, observed to see if worms move forward/backward, towards wet/dry)
March 12, 2015 1:23 p.m. – 1:50 p.m.	Theme: Worms Worm poem (*Growing Up Wild*) Group leader: Subject 2	Worm lab (students measured worms, observed to see if worms move forward/backward, towards wet/dry)
March 19, 2015 10:37 a.m. – 11:00 a.m.	Theme: Seeds Subject 2 introduced the activity for the day. Readers theater: *The Tiny Seed* All attending Subjects participated.	Planted marigold seeds
March 19, 2015 125 p.m. – 1:50 p.m.	Theme: Seeds Subject 2 introduced the activity for the day. Readers theater: *The Tiny Seed* All attending Subjects participated.	Planted marigold seeds

Although there were eight opportunities available for participating in the service learning project, not all students participated in every lesson due to absences and/or behavior issues. However, each student participated in a minimum of four lessons (Table 3).

Table 3

Student Service Learning Profile in Lessons

Subject No.	Grade	Social thinking - social communication profile	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
1	5	Nuance challenged social communicator/ socially anxious	X	X	X	X	X	X	X	X
2	4	Challenged social communicator on the cusp of emerging	X	X	X	X	X	X	X	X
3	2	Challenged social communicator on the cusp of emerging			X	X	X	X	X	X
4	1	Challenged social communicator			X	X	X	X	X	X
5	K	Significantly challenged social communicator			X	X		X	X	X

Note: Social thinking social communication profile (Winner, 2014).

Each of the lessons had a theme. Topics included fishing, spiders, worms, and seeds. During weeks one and three, students followed the lesson plan from *Growing Up Wild* meticulously with one student leading the large group instruction and then breaking into three small groups for a hands-on learning activity about the lesson theme. Students discussed and voted for the leader of the large group activity. The teacher assigned leaders and their assistants for the small group activities. During Week 2 and Week 4, the students decided to create a readers' theater around the selected theme so more students could be active participants during the large group presentation. The Readers Theater

format also gave students additional opportunities to practice social skills in the self-contained setting while they chose roles for each student to play, created storyboards, and practiced the script. Table 1 elucidates the level of social communication for each student, represented by a number, per Social Thinking –Social Communication Profile (Winner, 2014) as well as the number of service learning lessons in which each subject participated.

The service learning project was developed, organized, and monitored by the school district. Data generated from the project were released to the researcher through a partner use data agreement. The service learning project provided eight opportunities for students to participate over a period of 4 weeks. Table 3 explains when the lessons took place as well as the theme of the lessons and activities that took place.

Findings

The findings were organized to answer the following research questions:

1. To what degree does a service learning project facilitate social skills improvement for students with autism?

2. To what degree does a service learning project reduce problem behaviors in students with autism?

Quantitative data for social skills are presented first, followed by qualitative data for social skills. The qualitative data are portrayed through the lens of quantitative data: Is there evidence of a pattern of behavior? Next, quantitative data for problem behaviors are presented. Once again, the qualitative data for problem behaviors are

portrayed through the lens of quantitative data to determine if there are patterns of behavior present.

Social Skills Quantitative

To test the hypothesis that an environmental service learning project can facilitate social skills improvement for students with autism, paired samples statistics were created from data collected through the SSIS and analyzed using IBM SPSS Statistics. The mean of the SSIS social skills teacher subscale completed by the school's speech pathologist prior to the implementation of the service learning project was 84.3333 and the standard deviation was 13.45610. The mean for the SSIS social skills subscale completed following the service learning project was 86.8333 and the standard deviation was 10.92551. All students participating in the service learning project were male. Sex specific norms for males ages 5 to 12 years old were used to neutralize any differences in gender. Scores falling between 85 and 100 are considered within the average range. Social skills scores lower than 85 are below average and suggest social skills intervention is needed. The paired samples test indicated a mean of -2.50000 and a standard deviation of 3.27109. The results of a paired sample t test indicated there was no significant difference in mean scores between pre and post, $t(4) = -1.872$, $p = .120$. Although the p-value indicates the results are not statistically significant, evaluation of the numerical results suggests there may have been a positive change. Data indicated three out of five students demonstrated an increase in social skills and two students stayed at the same level (See Figure 1).

Figure 1 includes the numeric results of the SSIS Teacher Rating Scale for

Subjects 1, 2, 3, 4, and 5 completed by the speech language pathologist prior to and upon

completion of the service learning project. Analysis of the numeric data indicated three

students experienced an increase in social skills and two students showed no change.
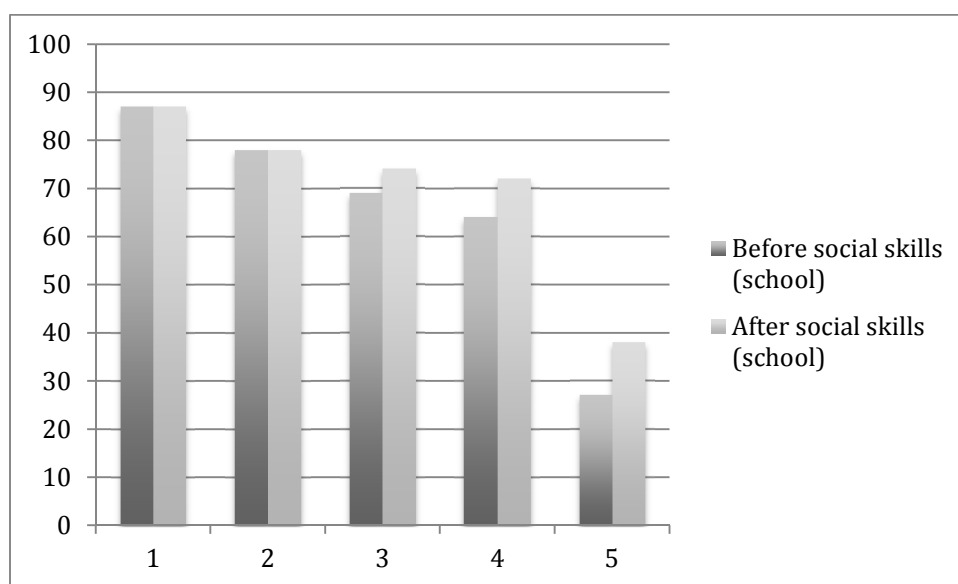
Figure 1. SSIS before and after social skills rating per teacher.

To test the hypothesis that participating in an environmental service learning

project can facilitate the generalization of social skills improvement at home for students

with autism, paired samples statistics were created from parent generated data through

the SSIS and analyzed using IBM SPSS Statistics. The mean of the SSIS social skills

parent subscale completed prior to the implementation of the service learning project was

81.8000 and the standard deviation was 8.70057. The mean for the SSIS social skills

parent subscale completed following the service learning project was 83.2000 and the

standard deviation was 6.76018. The paired samples test indicated a mean of 1.40000 and

a standard deviation of 5.59464. The results of a paired sample *t* test indicated there was

no significant difference in mean scores between pre and post, $t(3) = -1.872$, $p = .606$. Even though the p-value indicated the results are not statistically significant, evaluation of the numerical data suggests there was a positive change and that students may have generalized social skills from school to home. Data indicated two students demonstrated an increase in social skills, one student exhibited a decrease, and one student appeared to stay at the same level (See Figure 2).

The parents of Subjects 1, 3, 4, 5, and 6 returned the SSIS Parent Rating Scale reflected observations of their student in their home environment. Numeric data compiled from the surveys are presented in Figure 2. Analysis of the data suggested two students experienced an increase in social skills, one student showed no change, and one student demonstrated a decrease in social skills.
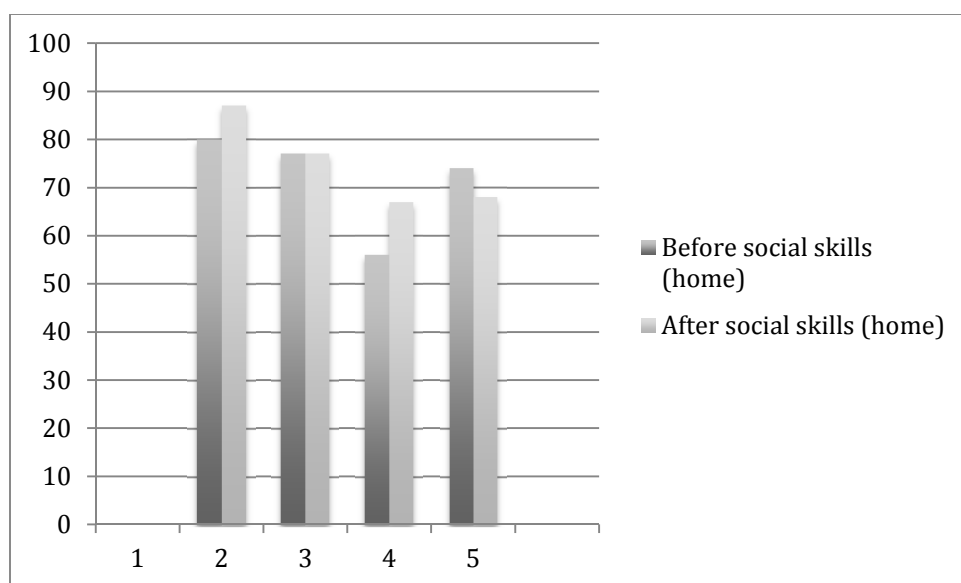
Figure 2. SSIS before/after social skills rating per parent.

Social Skills Qualitative

Quantitative data indicated there may have been a numeric positive change in social skills for most students. To further analyze this phenomenon, an analysis of numeric and qualitative data for individual subjects was conducted. Evaluation of Subject 1's quantitative data collected from the SSIS (Figure 3) indicated there was no change in his demonstration of social skills throughout the service learning project. Field notes suggest that Subject 1's self-control stayed at a constant level (Table 4). Subject 1 had difficulty regulating his emotions during five out of the seven service learning opportunities; however, on the last day of the project an observer noted that although Subject 1's voice was elevated five times during session 7, the intensity of his body language had improved over the four-week project; no demonstrations of intimidating postures and feet remained flat on the floor 85% of the time. Field notes also indicated Subject 1 stepped into a leadership role in the fifth session where Subject 1 asked to introduce the topic to the preschool students during large group instruction. Subject 1 maintained this role through the rest of the sessions.

The numeric data compiled from the SSIS Teacher Rating Scale breaking social skills into seven categories for Subject 1 are presented visually in Figure 3. Analysis of the data indicated Subject 1 did not experience a change in social skills.
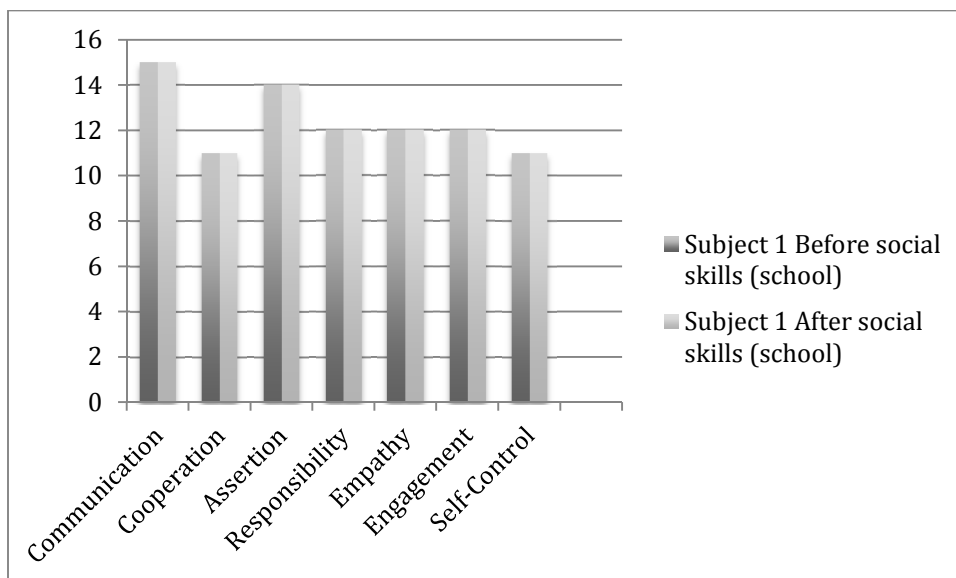
Figure 3. Subject 1 SSIS before/after social skills (school).

Qualitative data presented in the form of field notes from the two recorders are recorded in Table 4. The eight service learning lessons are organized by session representing the service learning lessons.

Table 4

Subject 1 Field Notes

Session 1	Subject 1 joined in singing the song and doing the hand movement towards the end of the song.
	During large group Subject 1 moved his chair close to a peer's leg. The peer started shaking the chair leg. Subject 1 began to move his hand in front of the peer's face during the hand movement part of the song. Para gave a verbal prompt; Subject 1 apologized to peer and stopped unexpected behavior.

(table continues)

Session 1	Subject 1 passed out papers on three tables while peer read a story to the preschool students during large group instruction.
	Subject 1 did not want to participate in the small group activity. Para prompted him to go for a walk. He went for a walk with his teacher.
Session 2	Did not sing at first during large group activity.
	Struggled to hold it together.
Session 3	Subject 1 felt a bit overwhelmed. He shouted out twice to the teacher. The teacher asked him to wait for one minute. Subject 1 calmed down, facial expressions and tone of voice became relaxed and he was close to baseline.
	Subject 1 called students by name (he remembered names from the previous week).
	Subject 1 was group leader during small group activity. He offered encouragement to the group of students he was working with.
	Subject 1 shouted out a reminder to two students to remind them to pick up their spider webs.
Session 4	Subject 1 read three parts during Readers Theater.
	Subject 1 was group leader during small group activity. He was playing with scissors, "Hey ___, look I'm Edward Scissor Hands!"

(table continues)

Session 4	During transition from preschool to class, Subject 1 played at kitchen in dramatic play area in preschool, When prompted to line up, he postured and elevated his voice. 1:1 Para prompted him to close his eyes and take five deep breaths. He transitioned back to class and went to his desk.
Session 5	Subject opened the large group activity. He said, "Welcome club. Today is all about worms and to start off I'm going to read a poem." He finished the poem and then told the preschoolers, "For safey guys, don't eat real worms." He told them the boy in the picture is eating a gummy worm.
	He was enthusiastic about singing the song. He had a calm body during the song.
	Subject 1 led a small group activity He introduced the day's activities and clarified that students could ask questions. He also asked, "Who wants to wear gloves?"
	During the group activity, Subject 1's voice was getting elevated. An adult prompted him to stay calm. Subject 1 sprayed his face over 5 times with water (water bottle used for worm acitivity). He remained at an excited/wired level and used breathing techniques several times to keep himself from escalating.
Session 6	During the transition from class to preschool, Subject 1 was playing in the kitchen in the dramatic play area at preschool but got right back on task when it was time to start the large group activity.

Session 6	Subject 1 started the large group activity with, "Raise your hands if you like worms." Today we're talking about worms. He read a poem about worms.
	After reading the poem, Subject 1 chose to sit in a chair at the back of the room during the song. He joined in the song.
	When the preschool students transitioned back to class Subject 1 was running around playing with two of his peers.
Session 7	Subject 1 asked the teacher if he could tell the preschool students what they were going to learn about. He introduced the topic.
	He read his part during the Readers Theater well with clear and positive pronunciation.
	After the story, he pushed his way out of the line and asked the teacher if he could tell the preschoolers what they were going to do next.
	He introduced the activity by saying, "Whose excited about planting seeds? With great enthusiasm.
	He was a small group leader. He wanted everybody to hold hands as they waled outside to the designated area.
	He moved around the table making sure all of the students in his group had their seeds.
	He was very bossy at times.

(table continues)

Session 7	His voice got elevated five times. His body language greatly improved from other service learning projects. He kept flat feet and no posturing postures 85% of the time.
Session 8	He followed directions to line up and walked to the preschool classroom.
	During the intro, Subject 1 got the preschoolers excited by explaining what they were going to do.
	He read two parts during the Readers Theater.
	Subject 1 was a small group leader with a peer acting as an assistant. Subject 2 grabbed the peer's hand to let him know he's in his group and to keep his assistant focused.
	During clean up, Subject 1 eventually offered to help clean up on his own.

Subject 2

Evaluation of Subject 2's numeric data from the SSIS (See Figure 4) also

indicated his social skills remained at the same level throughout the project. Field notes

suggested Subject 2 participated in all eight of the service learning lessons. Field notes

also indicated Subject 2's leadership style evolved from passive (followed directions but

did not recognize the needs of others) during lessons 1-4 to active (initiated conversation

with students in his group about the activity and kept them engaged in the activity,

recognized when his assistant was uncomfortable, and attempted to provide support for

him) during lessons 5-8 (See Table 5). Subject 2 demonstrated cooperation skills 4 out of 8 opportunities.

Analysis of numeric data obtained from the SSIS Parent Ratings Scale supports the increase in social skills that the field notes suggested. The analysis indicated Subject 2 demonstrated an increase in communication, cooperation, assertion, responsibility, and self-control (See Figure 5). However, the analysis also suggested Subject 2 experienced a decrease in engagement and remained at the same level in the area of empathy.

Before/after numeric data gathered from the SSIS Teacher Rating Scale for Subject 2 is visually displayed in Figure 4. Analysis of the data indicated Subject 2 did not experience a change in social skills.
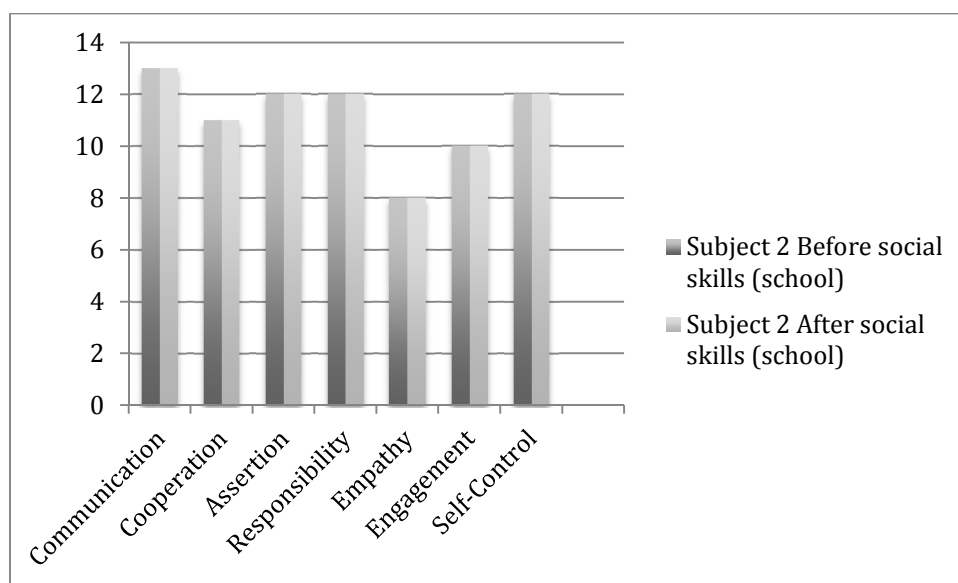
Figure 4. Subject 2 SSIS before/after social skills (school).

The histogram in Figure 5 represents the numeric data analysis collected from the SSIS Parent Rating Scales for Subject 2. Analysis of the data indicated Subject 2 demonstrated an increase in social skills in communication, cooperation, assertion,

responsibility, and self-control. The analysis also suggested Subject 2 experienced a

decrease in engagement and his empathy skills remained the same.
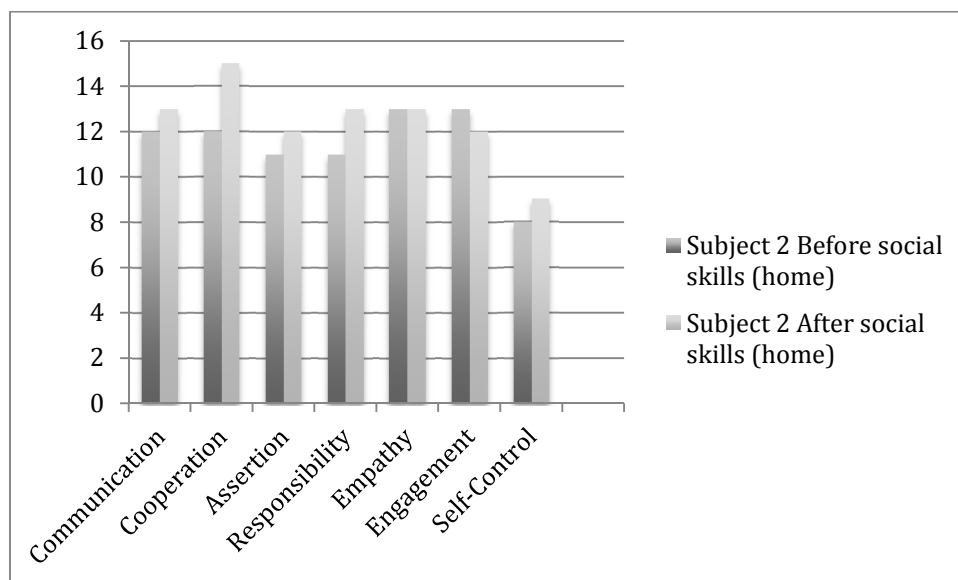
Figure 5. Subject 2 before/after social skills (home).

Table 5

Subject 2 Field Notes

Session 1	During transition time from class to preschool classroom, Subject 2 followed directions (walked in line, quiet voice, sat in assigned place).
	During the song, he looked at preschool students in front of him, sang the song, and performed hand movements.
	During first small group rotation, Subject 2 helped preschool students measure paper fish that they caught.

(table continues)

Session 1	When preschool students transitioned to their next group, Subject 2 wandered around the room.
	During the second rotation Subject 2 moved to the station where students were using magnetic fishing poles to catch paper fish with paper clips. He helped students catch the fish. While working in the fish catching station, he smiled and instructed preschool students to go to the next station.
	During the small group activities, Subject 2 engaged 1:1 with the students. He was smiling and appeared to be enjoying his task.
Session 2	During the large group activity, Subject 2 read a book to preschool students. He showed the pictures while he read the story.
	He was a group leader during the small group activity. During the activity he made helpful suggestions and helped students piece their puzzle together. He also offered words of encouragement such as, "You're doing great!" and "You're almost done!"
	He followed directions while transitioning back to the classroom.

(table continues)

Session 3	Subject 2 participated in Readers Theater.
	He was a group leader during the small group activity and was responsible for handing out spider web templates to preschool students in his group and for providing support to students as needed so they could accomplish weaving their spider web.
	He helped preschool students finish weaving their spider web.
	He praised one of his students and said, "You are a rock star. You finished your web."
	He stayed with his group until everyone finished weaving their webs.
Session 4	During Readers Theater Subject 2's role was to weave a spider in correlation with peers telling a story. During the storytelling, Subject 2 made comments but did not realize they were poorly timed during the storytelling.
	He was a group leader during small group activity.
	He did not recognize when someone needed help.
Session 5	Subject 2 was a group leader during the small group activity. He told the students, "We're going to look at worms."

(table continues)

Session 5	During the small group activity, he began by telling all the facts about worms that he knows. His group was very interested and engaged with their body language. He kept them interested by telling them to look at stuff.
	He appeared comfortable with the group and wanted the students to know facts about worms.
	Subject 2 was quick to help a peer cleanup when given a prompt by the teacher.
Session 6	Subject 2 listened during the large group activity. He didn't sing but had a calm body.
Session 7	During Readers Theater, Subject 2 read loudly and clearly appropriately for his audience. He read three parts during the Readers Theater.
	He was a group leader during the small group activity. While transitioning from the large group to the small group activity, Subject 2 approached a peer who was going to assist him with the activity. He said, "I know you didn't like what we did last time with the worms but today we're going to learn about seeds.
	During the activity, Subject 2 had a great tone of voice when he addressed the preschool students and made sure that all of the students in his group had their names on the cartons where they planted seeds.

(table continues)

Session 7	Subject 2 had good interactions with preschool students. He listened and interacted with them.
Session 8	Subject 2 read three parts in Readers Theater. He read very clearly with appropriate volume and confidence. He took charge in keeping younger peers quiet during Readers Theater. During the performance he quieted noisy peers by saying, "shh."
	Subject 2 was a small group leader. He gave a lot of verbal encouragement, "You're doing great!"
	During the small group activity, Subject 2 spoke off topic about ALS Ice Bucket Challenge.
	At the end of the small group activity, preschool students returned to their classroom. Subject 2 cleaned up his small group area and took the trays with milk carton planters into the preschool room.

Subject 3

Evaluation of the numeric data from the SSIS in Figure 6 suggests Subject 3

demonstrated an increase in social skills over the 4-week service learning project. Field

notes support this supposition, see Table 6. Throughout the project Subject 3

demonstrated the ability to follow directions when participating in structured activities

such as large and small group activities. Subject 3 had difficulty following expectations

during less structured time such as clean-up and transitions. Subject 3 activitely

participated during large and small group activities. During session 7, he enthusiastically

participated during readers' theater by reading three parts and elaborating an answer to a

student generated question.

Analysis of the numeric data from the SSIS Parent Rating Scales also supports the

hypothesis Subject 3 may have experienced an increase in social skills. The analysis

indicated Subject 2 demonstrated an increase in assertion and self-control (See Figure 7).

However, the analysis also suggests Subject 3 demonstrated a decrease in

communication, empathy, and engagement.

Numeric social skills data for each of the seven components of social skills

obtained from the SSIS Teacher Rating Scales for Subject 3 is represented visually in

Figure 6. Analysis of the data indicated Subject 3 experienced increased communication,

assertion, and empathy.
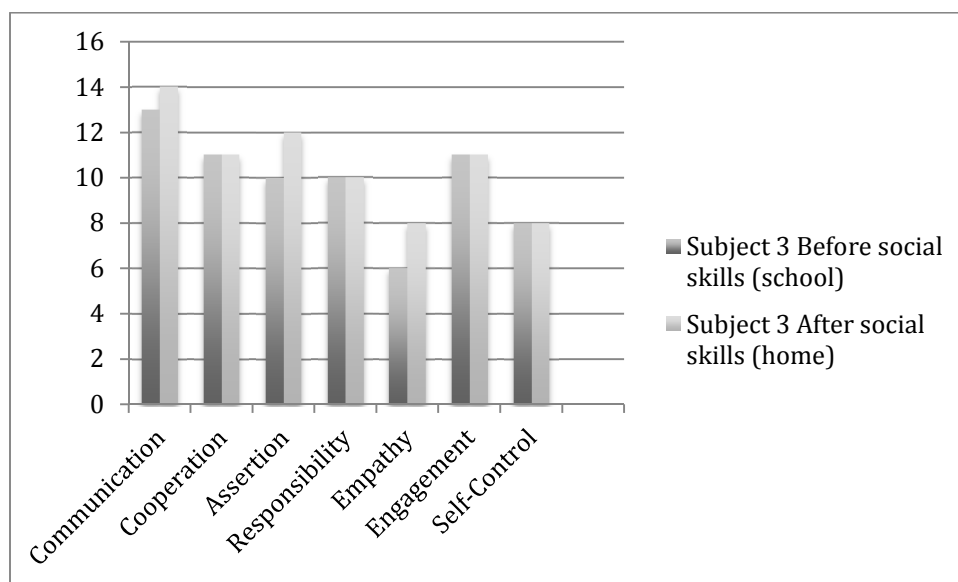
Figure 6. Subject 3 SSIS before/after social skills (school).

Analysis of Subject 3's numeric data obtained from the SSIS Parent Rating Scales is displayed in Figure 7. The analysis indicated Subject 3 may have experienced an increase in social skills in the areas of assertion and self control as well as a decrease in the areas of communication, empathy, and engagement.
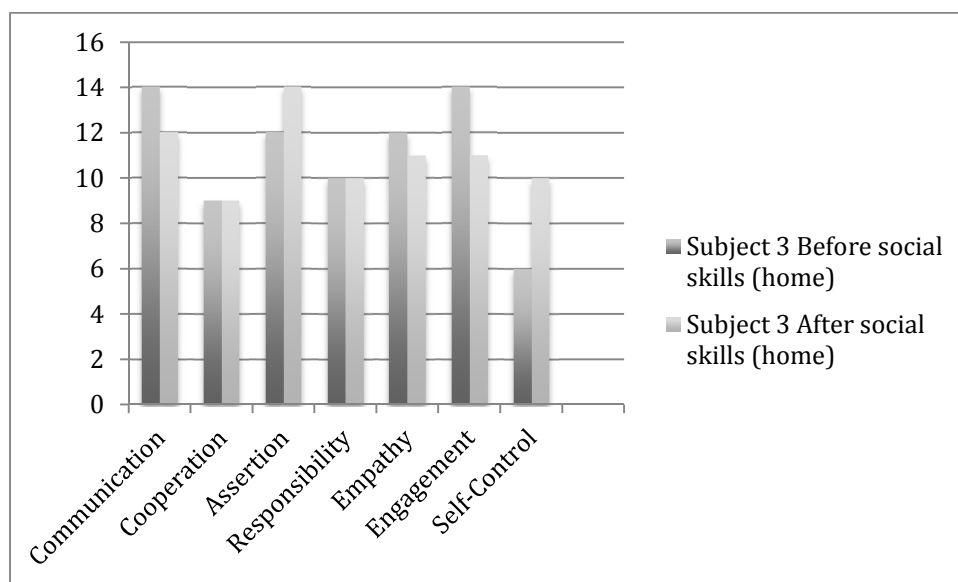
Figure 7. Subject 3 before/after social skills (home).

Transcribed field notes for Subject 3 collected by the two recorders are compiled in Table 6. The field notes are organized by session representing the service learning lessons.

Table 6

Subject 3 Field Notes

Session 1	Subject 3 followed directions during transition from classroom to preschool classroom.

(table continues)

Session 1	During large group activity, Subject 3 looked at students in front of him while singing a song and performing hand movements.
	During the small group activity Subject 3 helped preschool students measure their paper fish. He was calm and quiet, took the fish the student gave him, and measured it.
	Preschool students rotated through two groups during the small group activity. Subject 3 stayed in his assigned area during the rotation.
	At the end of the activity, he stood by the teacher and waited for instructions.
Session 2	Subject 3 assisted students with measuring their paper fish.
	During the small group activity he zoned out from time to time.
	There was limited language and mild interaction with preschool students.
Session 3	Subject 3 assisted a group leader with the small group activity. He had a calm voice the entire time and sat with a calm and quiet body.
	Subject 3 did very little instruction with the students. He looked at them but offered no words or assistance.
	He assisted a student sitting next to him when the student asked for help.

(table continues)

Session 4	Subject 3 read two parts during Readers Theater.
	He was assigned to assist a peer group leader during the small group activity. During the activity, Subject 3 sat at the table with quiet hands and voice, working on his web because the needle kept falling off.
	Subject 4 followed directions to line up and transition back to class.
Session 5	Subject 4 read his part during Readers Theater and sang the song with the group when given a prompt.
	He assisted a peer group leader during the small group activity.
Session 6	Subject 3 sang the song during the opening of large group.
	He assisted a peer group leader during the small group activity. He had a calm body during the small group activity.
	During cleanup after the small group activity, he was running around playing with two peers.
Session 7	During Readers Theater, Subject 3 read three parts and talked about the pictures he drew.
	He elaborated an answer to a question directed at him from the audience.

(table continues)

Session 7	During the small group activity, Subject 3 was assigned to assist a peer group leader. He was prompted three times to participate in the small group activity.
	During cleanup, Subject 3 left the area to play with a peer on the playground.
Session 8	During Readers Theater, Subject 3 read two parts with a quiet voice. He did not demonstrate an awareness of the audience's needs.
	During the small group activity, he was assigned to assist a peer group leader. The group leader grabbed Subject 3's hand during the transition to small group to remind him whose group he was in and to help keep him focused.
	Subject 3 helped clean up when given a verbal prompt.

Subject 4

Evaluation of numeric data from the SSIS (See Figure 8) indicated Subject 4 also demonstrated an increase in social skills. Field notes presented in Table 7 support this hypothesis. Subject 4 was absent the first week of the project so he only partcipated in sessions 3 to 8. During sessions 3 to 5, Subject 4 was off task during large and small group activities. Subject 4 stayed in designated area during activities, but did not actively engage in the activity. During sessions 7 and 8, however, Subject 4 actively participated during Readers Theater by reading two parts. During session eight, Subject 4 was engaged during the small group activity and offered encouragement to students in his

group. Subject 4 continued to have difficulty following routines during unstructured times such as cleanup and transitions.

Analysis of numeric data obtained from the SSIS Parent Rating Scales also indicated Subject 4 experienced an increase in social skills specifically in the areas of communication, assertion, responsibility, engagement, and self-control (See Figure 9). The analysis also suggested Subject 4 demonstrated a decrease in cooperation and empathy.

Numeric data collected from the SSIS Teacher Rating Scales for Subject 4 were broken down into seven categories of social skills. Subject 4's pre/post social skills data is displayed in Figure 8. Analysis of the data indicated Subject 4 experienced an increase in communication, assertion, responsibility, empathy, and engagement.
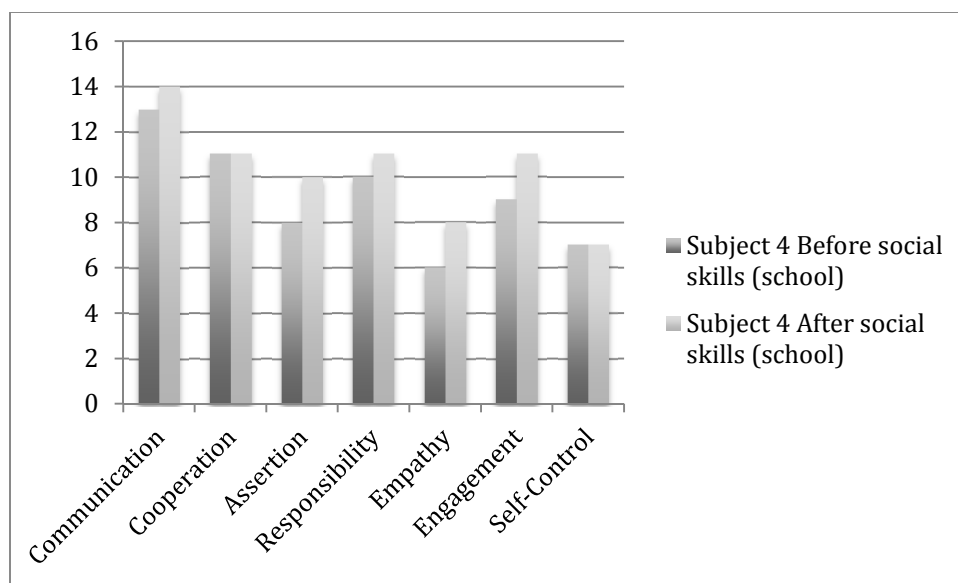
Figure 8. Subject 4 SSIS before/after social skills (school).

The histogram in Figure 9 is a visual display of the analyis of numeric data collected from the SSIS Parent Rating Scales for Subject 4. Analysis of the data indicated

Subject 4 demonstrated an increase in communication, assertion, responsibility, engagement, and self-control as well as a decrease in cooperation and empathy.
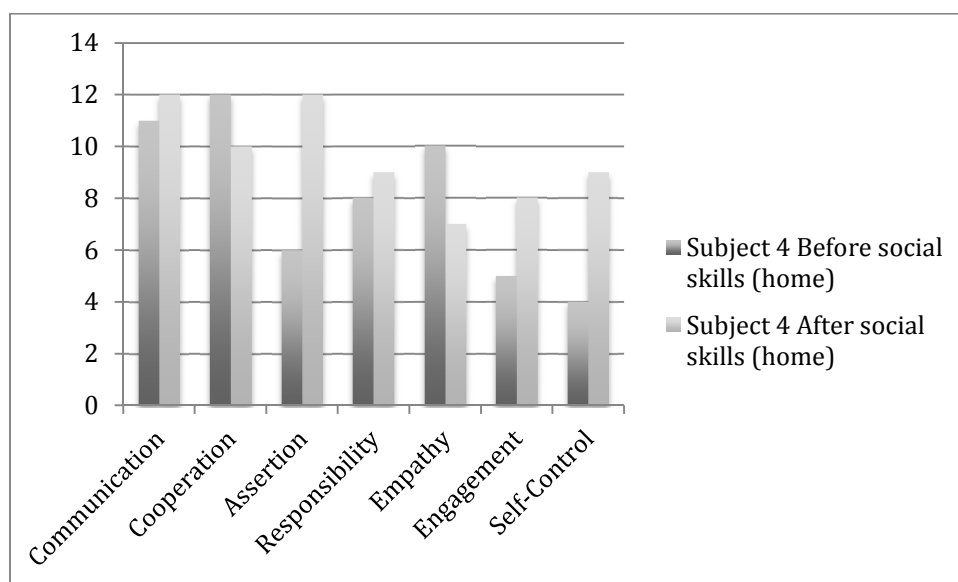
Figure 9. Subject 4 before/after social skills (home).

Qualitative data in the form of field notes provided by two recorders are displayed in Table 7. The notes are organized into sessions representing the service learning lessons.

Table 7

Subject 4 Field Notes

Session 1	Absent
Session 2	Absent
Session 3	During small group activity, Subject 4 sat quietly outside his group with quiet hands and voice. He appeared to be more interested in the fabric covering the bookshelf next to him as that is where his eyes were.

(table continues)

Session 4	He crawled over to the classroom paraeducator and requested a hug. Hug given, he walked away.
	During Readers Theater, Subject 4 read his part. No engagement. He Played with gum and stared at the ceiling. He needs to work on articulation.
	He was assigned to assist a peer group leader during the small group activity. He stayed with the group but wandered around the classroom after all the students had left the table.
	Followed directions to transition back to class.
Session 5	Subject 4 was off task during opening of large group activity.
	He was assigned to assist a peer group leader during small group activity. During the transition from large to small group activity, Subject 4 stood in designated area while preschool students lined up behind him. He then marched his students outside to the worm activity. No verbal interaction with preschool students during small group activity.
	Distracted during small group activity.
Session 6	Subject 4 had a calm body during the opening of the large group activity. He initially listened during the activity but did not participate in singing the song.

(Table continues)

Session 6	During the transition from the large group activity to the small group activity, Subject 4 stood in the designated area while preschool students lined up behind him. He then marched his students outside to the worm activity.
Session 7	Participant 4 read two parts during the Readers Theater. During the small group activity, he was assigned to assist a peer group leader. Subject 4 needed some support but remembered some of what to do. During cleanup, Subject 4 left assigned area to play with peers on the playground. When given a verbal prompt, he returned to his assigned area. He then yelled, " _____ ! Come back."
Session 8	Subject 4 read two parts during Readers Theater. He read his parts very quietly. Subject 4 had difficulty waiting for his turn during Readers Theater and began talking. Older peers promptly yelled, "shhh." Subject 4 responded to the prompt to be quiet. During small group activity, Subject 4 was assigned to assist a peer group leader. He was more involved in this session than the group leader and offered encouragement to the preschool students. He also assisted preschool students in watering the seeds they planted. During cleanup, Subject 4 was off task and was playing with peers. He said, "This was wonderful teacher _____."

Subject 5

Evaluation of Subject 5's numeric data in Figure 10 suggests an increase in five out of the seven areas of social skills during the service learning project. Field notes also indicated there may have been a positive change in social skills (Table 8). Subject 5 participated in five of the service learning lessons. Subject 5 participated during Readers Theater when given prompts by the teacher. Subject 5 read his parts well, but then reverted back into his own world, oblivious to peers or preschool students. Subject 5 waited to be invited to participate in large and small group activities, but was receptive and accepted invitations to participate. Subject 5 had difficulty regulating his emotions during unstructured activities such as clean-up and transitions.

Analysis of numeric data obtained from the SSIS Parent Rating Scales also indicated Subject 5 may have demonstrated an increase in communication, assertion, and engagement (See Figure 11); however, analysis also suggested Subject 6 may have experienced a decrease in cooperation, responsibility, empathy, and self-control.

Social skills data for Subject 5 obtained from the SSIS Teacher Ratings Scale was broken down into seven categories. The pre/post social skills data reflecting each of these categories for Subject 5 is displayed in Figure 10. Analysis of the data indicated Subject 5 experienced an increase in communication, cooperation, responsibility, and self-control.
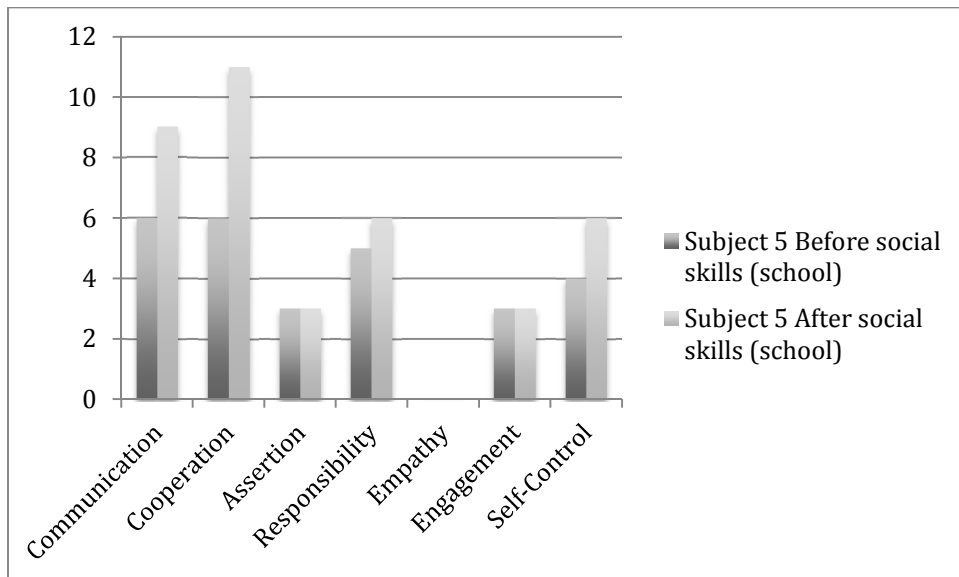
Figure 10. Subject 5 SSIS before/after social skills (school).

The histogram in Figure 11 represents an analysis of numeric data obtained from the SSIS Parent Rating Scales for Subject 5. The analysis suggested Subject 5 may have experienced an increase in communication, assertion, and engagement as well as a decrease in cooperation, responsibility, empathy, and self-control.
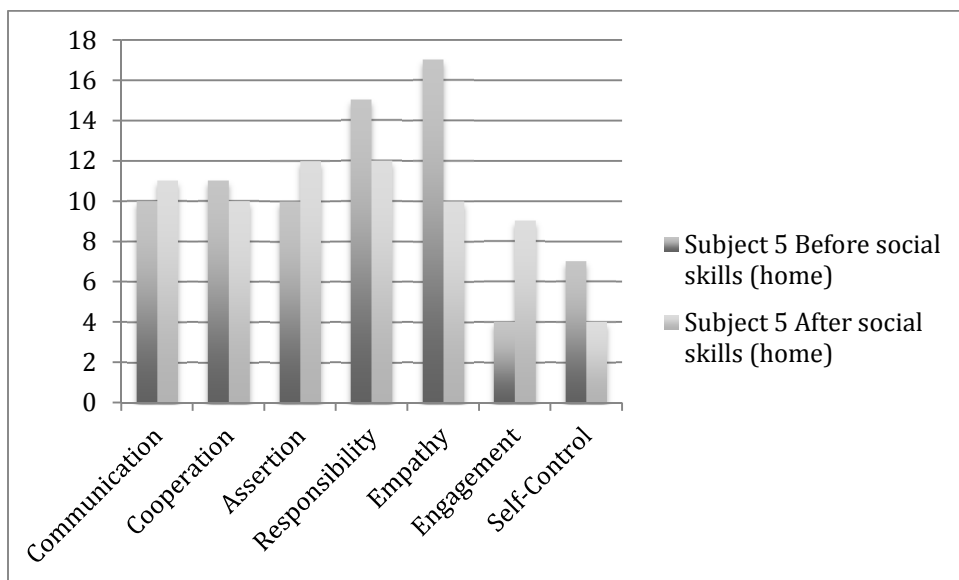
Figure 11. Subject 5's before/after social skills (home).

Qualitative data consists of field notes provided by two recorders. The field notes are organized into Table 8 and are organized by session reflecting the service lessons.

Table 8

Subject 5 Field Notes

Session 1	He was not offered an opportunity to participate in this lesson.
Session 2	He was not offered an opportunity to participate in this lesson.
Session 3	During small group activity, Subject 5 sat in a chair quietly with a paraeducator assisting him with weaving a spider web. He was very focused with a calm and quiet body even after the paraeducator redirected her attention to another student.
Session 4	Subject 5 participated during Readers Theater. He did not want to read his part at first but after a verbal prompt from the teacher he read quickly and moved out of the way for the next person in line.
	During the small group activity, Subject 5 was assigned to help a peer group leader. He did not interact with the preschool students. Subject 5 was unable to participate in the spider web activity as the group ran out of needles. He demonstrated having a flexible brain by sitting quietly during the activity.
	When the small group activity was over, Subject 5 followed directions by lining up and walking back to class.

(table continues)

Session 5	Subject 5 chose not to participate in this lesson
Session 6	During the opening of the large group activity, Subject 5 sat on a chair with the group but was in his own world, not paying attention and jumping in and out of his chair.
Session 7	During Readers Theater, Subject 5 followed directions and sat in a chair until it was his turn to read his part. He read his part well but was mostly oblivious to what was happening around him. He demonstrated some brief attention to the team. He sat down in the chair when prompted by the teacher to sit still. During transition to the small group activity, Subject 5 was in his own world, dancing around. When the teacher asked if he wanted to help a peer group leader during the small group activity, he responded yes and went to his assigned table.
Session 8	During Readers Theater, Subject 5 sat in a chair by the group. He jumped in and out of his chair but calmed down as the reading began. He read his part very well. At the closing of Readers Theater, Subject 5 joined his peers to take a bow in front of the audience. During the transition from large group activity to small group activity, Subject 5 became over stimulated. He chose not to participate in the small group activity and return to the classroom.

Problem Behaviors

The SSIS defines problem behaviors as behaviors that impact a person's ability to demonstrate expected behavior in social settings. Items on the problem behavior scale are broken into five categories: externalizing, bullying, hyperactivity/Inattention, internalizing, and autism spectrum. Externalizing behaviors include temper tantrums, physical aggression towards people or objects, fighting with others, and non-compliance. Bullying behaviors encompass doing things to others and/or making others do things that make them feel unsafe. Hyperactivity/Inattention behaviors are comprised of fidgeting, easily distracted, impulsive, and not focused. Students demonstrating internalizing behaviors may withdraw from others, be lethargic, act sad/depressed, or act anxious. Behaviors considered for the autism spectrum category include responding to and/or initiating conversation, establishing eye contact with others, showing empathy for others,demonstrating the ability to adjust to changes in routine, inviting others to join in activities, and activitely participating in activities with others. Ideally, students would exhibit average or below average problem behaviors in order to function optimally in social settings such as school, home, and the community. Table 9 includes baseline data from the SSIS indicating the students participating in the service learning project had a range of problem behaviors that leaned towards above average.

Table 9

SSIS Student Profile – Baseline Problem Behaviors (school)

	Subject 1	Subject 2	Subject 3	Subject 4	Subject 5
Externalizing	Average	Above average	Above average	Average	Above average
Bullying	Above average	Average	Above average	Average	Above average
Hyperactivity/ Inattention	Average	Above average	Above average	Average	Above average
Internalizing	Above average	Average	Average	Above average	Above average
Autism Spectrum	Average	Above average	Above average	Above average	Above average

Problem Behaviors Quantitative Data

To test the hypothesis that an environmental service learning project can facilitate

the reduction of problem behaviors for students with autism, paired samples statistics

were created from data collected through the SSIS and analyzed using IBM SPSS

Statistics. The mean of the SSIS problem behaviors teacher subscale completed by the

school's speech language pathologist prior to the implementation of the service learning

project was 125.1667 and the standard deviation was 6.61564. The mean for the SSIS

problem behaviors subscale completed following the service learning project was

124.0000 and the standard deviation was 5.13809. All students who participated in the

service learning project were male. Sex norms for males ages 5–12 years were used to

neutralize any gender differences for both the teacher groups and the parent groups. With

average scores ranging between 85 and 100, behavior scores higher than 115 indicate the

individual demonstrates more than the average number of problem behaviors compared

to the norm group. The paired samples test indicated a mean of 1.16667 and a standard

deviation of 2.40139. The results of a paired sample t test indicated there was no

significant difference in mean scores between pre and post, $t(4) = 1.190$, $p = .287$.

Although the p-value indicates the results are not statistically significant, evaluation of

the numerical data suggests there may have been a positive change (See Figure 12).

The histogram in Figure 12 is a visual display of the numeric data representing

before/after problem behaviors collected from the SSIS Teacher Rating Scale for

Subjects 1, 2, 3, 4, and 5. Analysis of the data indicated one of the subjects experienced a

decrease in problem behaviors.
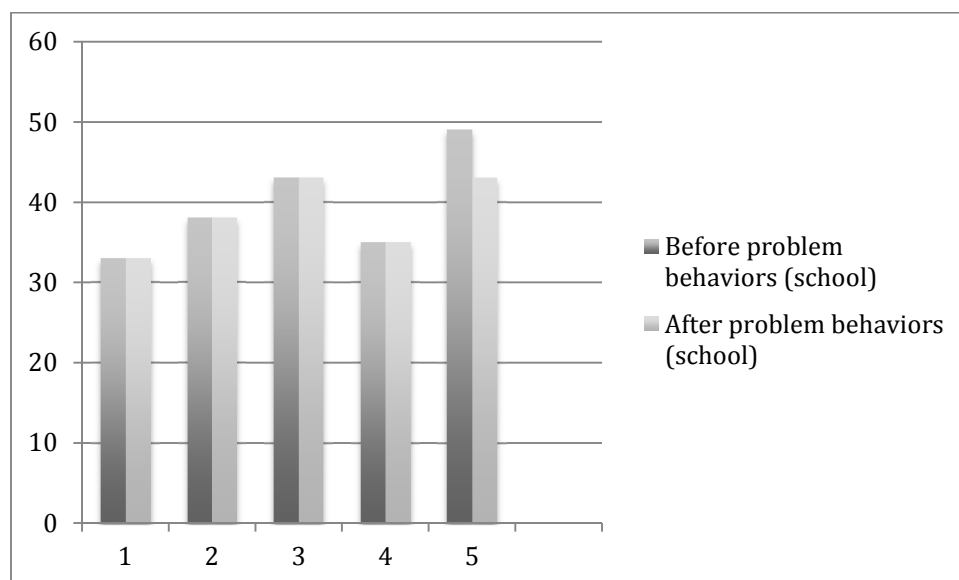
Figure 12. Before/after behaviors (school)

To test the hypothesis that participating in an environmental service learning project can enable students with autism to generalize the reduction of problem behaviors at home, paired samples statistics were created from parent generated data collected through the SSIS and analyzed using IBM SPSS Statistics. The mean of the SSIS problem behaviors parent subscale completed prior to the implementation of the service learning project was 117.0000 and the standard deviation was 4.18330. The mean for the SSIS problem behaviors parent subscale completed following the service learning project was 120.8000 and the standard deviation was 7.46324. The paired samples t-test indicated a mean of -3.80000 and a standard deviation of 4.76445. The results of a paired sample t test indicated there was no significant difference in mean scores between pre and post, $t(3) = -1.783$, $p = .149$. Although the p-value indicates the results are not significant, evaluation of the numerical data suggests there may have been a negative change (See Figure 13). Three out of four students demonstrated an increase in problem behaviors at home while one student exhibited a decrease.
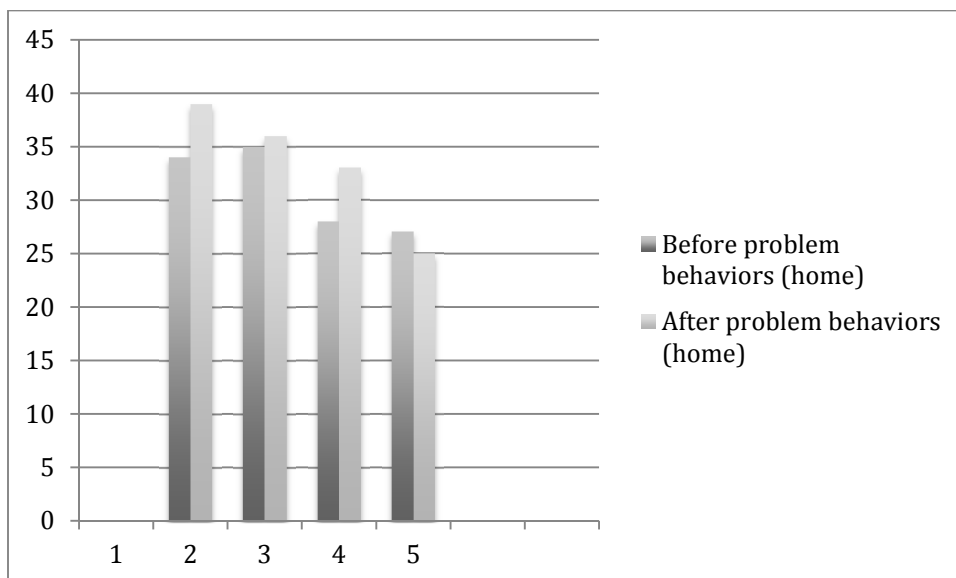
Figure 13. Before/after problem behaviors (home).

Qualitative Data

Problem behaviors impact an individual's ability to have social relationships. Field notes collected during the service learning project provided insight into both social skills and problem behaviors. Quantitative data suggests that problem behaviors may have been reduced and/or stayed at the same level during the service learning project. To gain a better understanding of this observation, an analysis of numeric and qualitative data for individual subjects was conducted. Evaluation of numeric data collected from the SSIS Teacher Rating Scales indicated Subject 1's problem behaviors remained at a constant level throughout the service learning project (Figure 14). Field notes suggest he may have experienced a reduction in problem behaviors. Following is a presentation of field notes. During the first session, Subject 1 was off task during the large group activity and indicated he did not want to participate in the small group activity. Subject 1's 1:1 para prompted him to go for a walk with the teacher. During Session 2 he attempted to

participate, but he was flagging and struggled to hold it together. Subject 1 participated in

Session 3 and became a bit overwhelmed during the transition from the large to small

group activity. Subject 1 responded postitvely to a redirection given by the teacher. He

was the group leader during the small group activity and offered encouragment to the

students he was working with. During Session 4, Subject 1 participated in both the large

and small group activities. Subject 1 demonstrated off task behavior during the small

group activity stating, "Hey _____, look I'm Edward Scissor Hands!" Subject 1 was also

off task during the transition from preschool to class; He played in the kitchen at the

dramatic play area in the preschool classroom. When given a prompt to line up, Subject 1

adopted an intimidating posture and his voice became elevated. Subject 1 stepped up to

be the leader of the group in Session 5. Subject 1 led the large group activity as well as

was in charge of a small group activity. During the small group activity, Subject 1

became overstimulated and needed verbal prompts to use breathing techniques to regulate

his emotions. Subject 1 continued in the leader role for Session 6 by opening the large

group activity. However, after his opening Subject 1 sat at the back of the room. During

the transition from large to small group, Subject 1 gravitated back to the dramatic play

area and played in the kitchen until it was time to start the small group activity. He

fulfilled his commitment as a small group leader, but once the preschool students went

back to class, he left his area to play with peers instead of cleaning up. Subject 1

continued in the leadership role for Session 7. He provided the introduction to the large

group activity, participated during Readers Theater, and was a small group leader. During

the small group activity Subject 1 was bossy at times and his voice elevated five times.

However, one of the observers noted Subject 1's body language had greatly improved

from other service learning projects. He kept flat feet and did not demonstrate posturing

85% of the observed time. During Session 8, Subject 1 remained in the leadership role

during both large and small group activities. Subject 1 gave his peer assistant prompts to

keep him focused during the small group activity. Subject 1 also offered to help clean up

after some wait time. The offer to clean up was an improvement over prior service

learning lessons where he demonstrated off task behavior by leaving the area to go play

with peers.

The SSIS Parent Rating Scales for Subject 1 was not returned. Therefore, there is

no data available to describe Subject 1's problem behaviors at home. Subject 1's pre/post

problem behaviors numeric data collected from the SSIS Teacher Rating Scale is

displayed visually in Figure 14. Analysis of the data indicated Subject 1 did not

experience a change in problem behaviors.
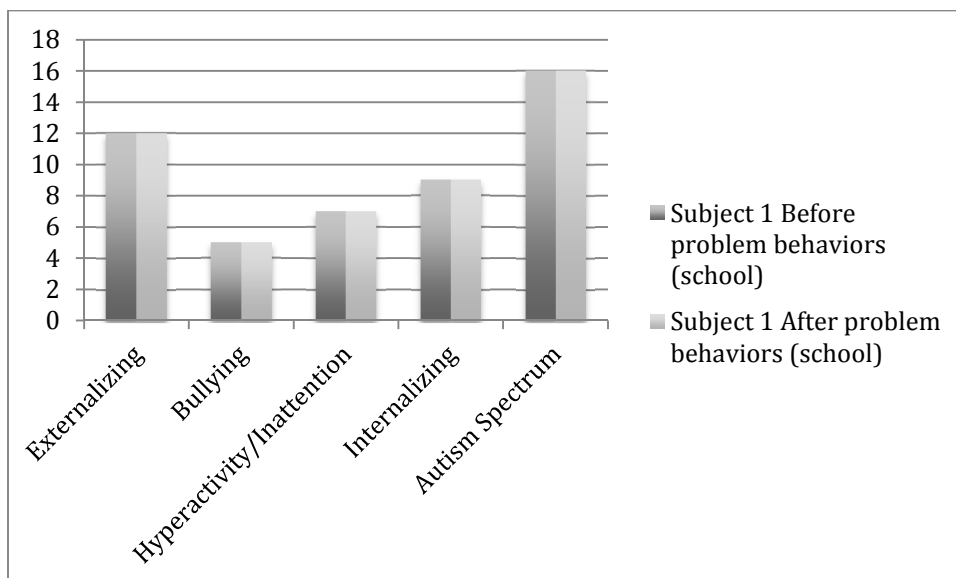
Figure 14. Subject 1 before/after problem behaviors (school).

Subject 2

Evaluation of numeric data obtained from the SSIS Teacher Rating Scales indicated no change in Subject 2's problem behaviors (See Figure 15). Field notes support this hypothesis. Throughout all eight sessions of the servie-learning project, Subject 2 was engaged in both large and small group activities. Subject 2 interacted with the preschool students and provided them with knowledge on specific topics as well as encouragement. During Session 7 Subject 2 demonstrated empathy towards a peer assistant in his small group.

However, data collected from the SSIS Parent Rating Scales indicated Subject 2 demonstrated an increase in problem behaviors at home. Although Subject 2's hyperactivity/inattention behaviors decreased, internalizing and autism spectrum behaviors increased (Figure 16). The histogram in Figure 15 is a visual representation of Subject 2's pre/post problem behaviors generated with numeric data provided by the

SSIS Teacher Rating Scales. Analysis of the data indicated Subject 2 did not experience a

change in problem behaviors.
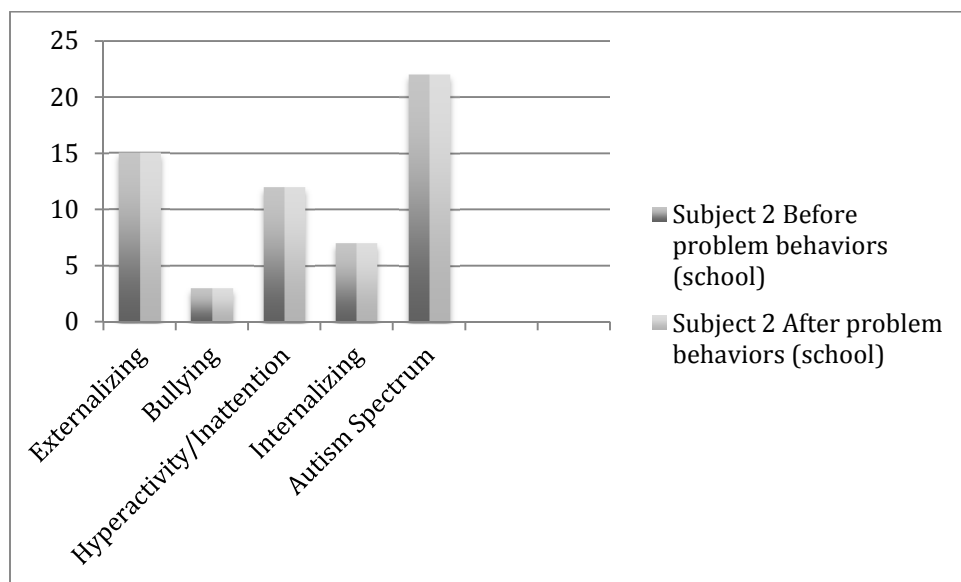
Figure 15. Subject 2 before/after problem behaviors.

The histogram in Figure 16 is a visual representation of Subject 2's pre/post

problem behaviors generated with numeric data provided by the SSIS Parent Rating

Scales. Analysis of the data indicated Subject 2 demonstrated a decrease in

hyperactivity/inattention and an increase in internalizing and autism spectrum behaviors.
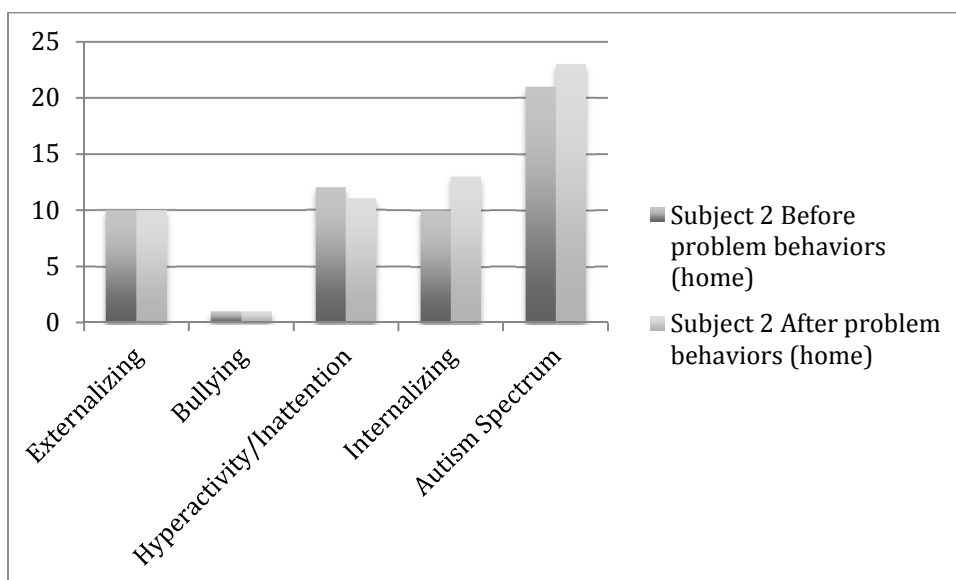
Figure 16. Subject 2 before/after problem behavior (home).

Subject 3

Looking at the pre-post problem behaviors numeric data collected from the SSIS

Teacher Rating Scales in Figure 12, it appears there was no change in Subject 3's

problem behaviors. However, analyzing the components of problem behavior

individually suggests there may have been an increase in internalizing and a decrease in

autism spectrum behaviors (Figure 17). Field notes support the possibility of a decrease

in autism spectrum behaviors, but there are a limited number of observations

demonstrating an increase in internalization. Subject 3 actively participated in both large

and small group activities when given a role in Readers Theater or a job measuring fish.

Participation in cooperative activities demonstrated a possible reduction of autism

spectrum behaviors. During Session 1 it was noted Subject 3 "zones out" from time to

time. During the transition from large to small group during Session 8, Subject 3 needed

a prompt from a peer to help him stay focused on his group. Withdrawal is one of the

measures associated with autism spectrum behaviors in the SSIS. Data obtained from the

SSIS Parent Rating Scales suggested Subject 3 demonstrated a decrease in internalizing

and an increase in externalizing, hyperactivity/inattention, and autism spectrum behaviors

(Figure 18). Bullying behaviors remained constant.
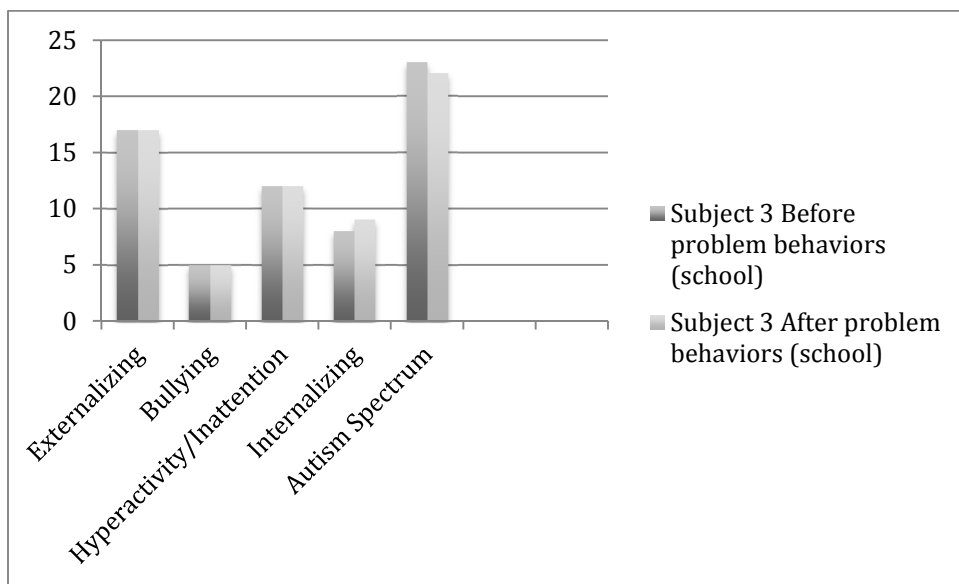
Figure 17. Subject 3 before/after problem behaviors (school).

The numeric data obtained from the SSIS Parent Rating Scales representing

Subject 3's problem behaviors is displayed visually in Figure 18. Analysis of the numeric

data indicated Subject 3 demonstrated a decrease in internalizing and an increase in

externalizing, hyperactivity/inattention, and autism spectrum behaviors.
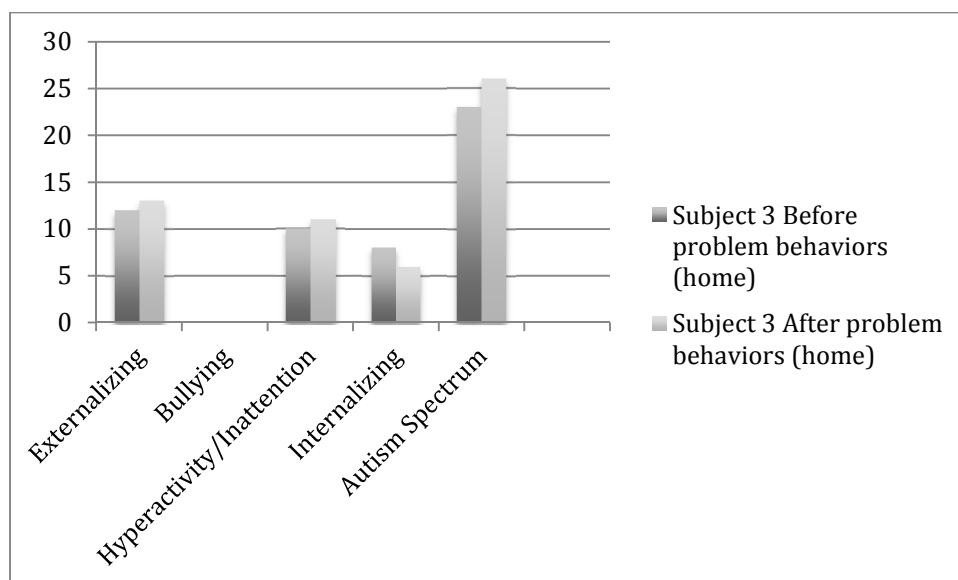
Figure 18. Subject 3 before/after problem behaviors (home).

Subject 4

Evaluation of quantitative data obtained from the SSIS Teacher Rating Scales

indicated there was no change in Subject 4's problem behaviors (Figure 12). Analyzing

individual strands of problem behaviors through the lens of the SSIS suggests a slight

decrease in autism spectrum behaviors (Figure 19). Field notes support the hypothesis

there may have been a slight decrease in autism spectrum behavior. Session 3 was the

first service learning lesson Subject 4 participated in. During Readers Theater Subject 4

read his prompt when prompted. Subject 4 was assigned to assist a peer group leader

during the small group activity. During this activity, Subject 4 sat quietly outside his

group with quiet hands and voice, but appeared to be more interested in the fabric

covering the bookshelf next to him. During Session 4, Subject 4 participated in Readers

Theater when prompted, but the rest of the time he was playing with gum and staring at

the ceiling. During the small group activity, Subject 4 stayed with the group. Subject 4

was off task during both the large and small group activities. Subject 4 did not participate in any verbal interaction with the preschool students during the small group activity. Subject 4 sat with a calm body and initially listened during the opening large group activity of Session 6, but then lost focus. During Session 7, Subject 4 read two parts during Readers Theater. Throughout the small group activity, Subject 4 demonstrated an understanding of what to do when given support. Subject 4's participation increased during Session 8. Subject 4 not only read two parts during Readers Theater, but he was also actively engaged during the small group activity and offered encouragement to the preschool students. Throughout the project, Subject 4 participated when given a structured setting with clear expectations, such as the readers theater. Subject 4 demonstrated an understanding of his role in the cooperative activity and he eagerly participated. Participation in group activities indicated a decrease in autism spectrum behaviors. Subject 4 had more difficulty staying on task when his role in an activity wasn't clearly defined such as during the small group activity. During the small group activities, Subject 4 was expected to interact with preschool students by talking about the activity, answering questions, and assisting students as needed. Field notes indicated during small group activities in early sessions, Subject 4 was withdrawn, which can be attributed to autism spectrum behavior; however, as the lessons progressed he became a more activite participant.

Data obtained from the SSIS Parent Rating Scales indicated Subject 4 experienced an increase in externalizing and hyperactivity/inattention behaviors, and a

decrease in internalizing and autism spectrum behaviors (See Figure 20). Subject 4's

problem behavior numeric data collected from the SSIS Teacher Rating Scale is

displayed visually in Figure 19. The data suggested Subject 4 experienced a decrease in

autism behaviors.

Figure 19. Subject 4 before/after behaviors (school).

The histogram in Figure 20 is a visual representation of Subject 4's before/after

problem behaviors generated with numeric data collected from the SSIS Parent Rating

Scales. Analysis of the data suggests Subject 4 experienced an increase in externalizing

and hyperactivity/inattention behaviors and a decrease in internalizing and autism

spectrum behaviors.
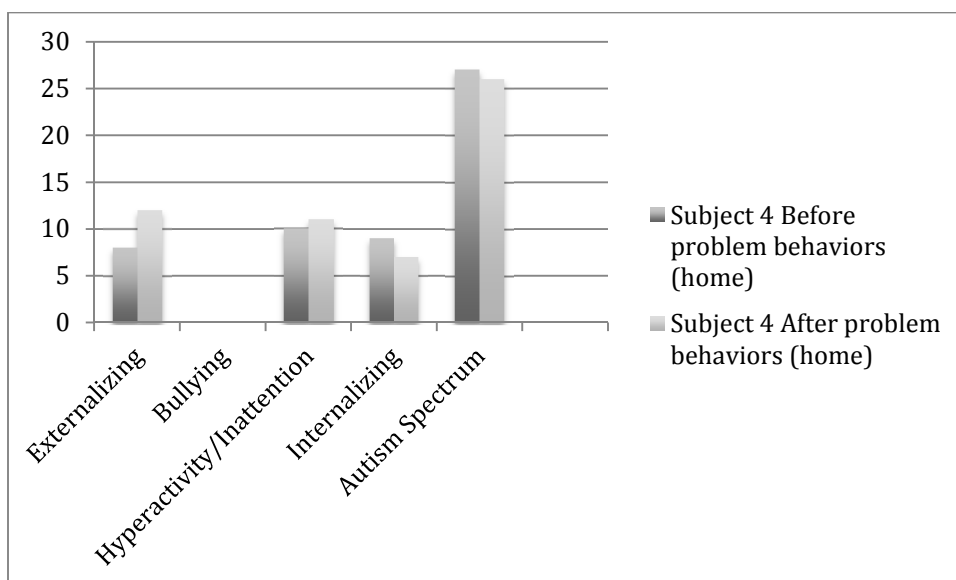
Figure 20. Subject 4 before/after problem behaviors (home).

Subject 5

Evaluation of numeric data collected from the SSIS Teacher Rating Scales suggested Subject 5's problem behaviors decreased in the areas of externalizing, bullying, hyperactivity/inattention, and autism spectrum (Figure 21). Field notes indicate that while Subject 5 participated in five out of the eight service learning lessons, there was not a noticeable reduction of problem behaviors during the actual lessons. During Readers Theater Subject 5 sat in a chair with support such as proximity and verbal prompts from the teacher until it was his turn to read instead of lining up with the rest of the students in another room; When the teacher gave a verbal prompt, Subject 5 went to the assigned area, read his part, and returned to his designated chair. This was Subject 5's routine throughout all of the service learning lessons. Field notes also suggest that while Subject 5 indicated he wanted to assist during the small group activities, he was a passive observer. During small group activities, Subject 5 stayed in the designated area for the

most part and participated in the activity, but did not interact with the preschool students or peers. During Sessions 6 and 7, Subject 5 was observed to withdraw into his own world during the large group activity and the small group activity respectively.

Analysis of numeric data collected from the SSIS Parent Rating Scales suggested Subject 5 demonstrated an increase in externalizing behaviors and a decrease in hyperactivity and autism spectrum behaviors (Figure 22). The histogram in Figure 21 is a visual representation of Subject 5's problem behavior numeric data collected from the SSIS Teacher Rating Scale. The data indicated Subject 5 experienced a decrease in externalizing, bullying, hyperactivity/inattention, and autism spectrum behaviors.

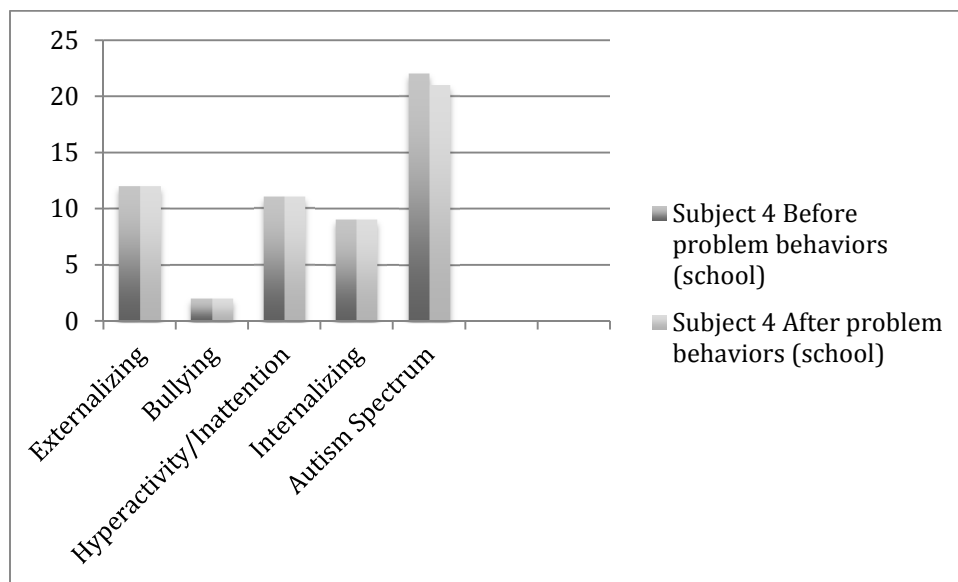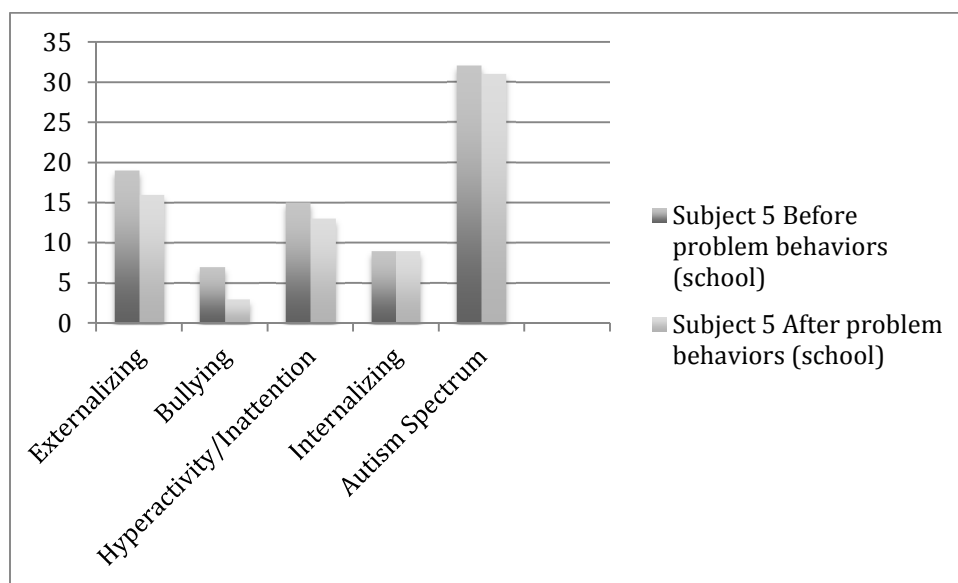*Figure 21.* Subject 5 before/after problem behaviors (school).

The histogram in Figure 22 is a visual representation of Subject 5's before/after problem behaviors generated with numeric data provided by the SSIS Parent Rating Scales. Analysis of the data indicated Subject 5 demonstrated an increase in externalizing behaviors and a decrease in hyperactivity/inattention and autism spectrum behaviors.
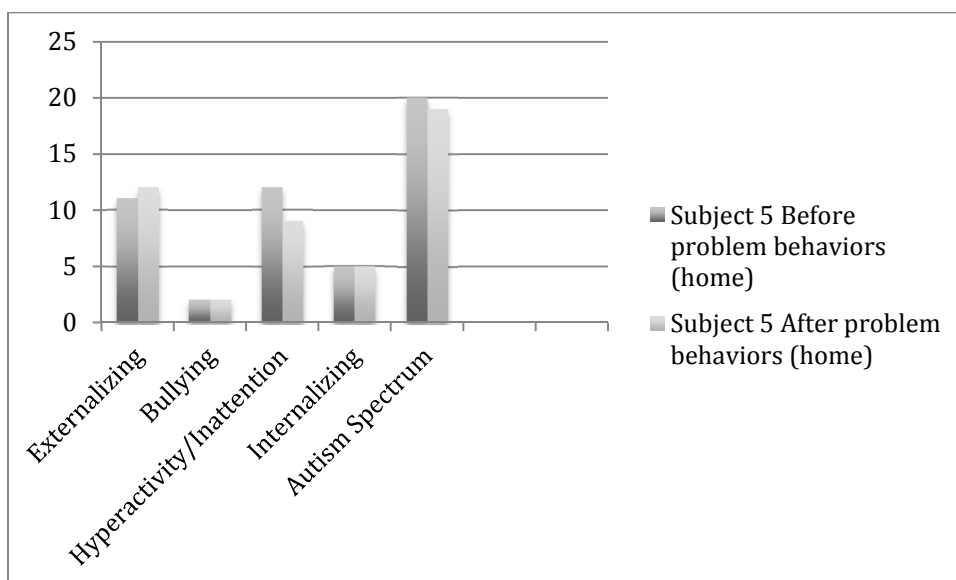
Figure 22. Subject 5 before/after problem behaviors (home).

Analysis of Numeric Data and Level of Social Communication

Subjects participating in the study represented five levels of social

communicators: emerging, nuance challenged-socially anxious, challenged-on the cusp,

challenged, and significantly challenged. Table 10 organizes numeric data for social

skills from the SSIS Teacher Rating Scales through the lens of social communication

levels. Subject 2 and Subject 3 exhibited social communication skills at the challenged-

on the cusp level. Analysis of numeric data obtained from the SSIS Teacher Rating

Scales indicated Subject 3 demonstrated an increase in three out of the seven areas of

social skills and experienced no change in four out of the seven areas. Evaluation of the

numeric data obtained from the SSIS Teacher Rating Scales suggested Subject 2 did not

experience a change in social skills.

Table 10 also includes information showing Subject 4 exhibited social

communication skills at the challenged level and analysis of the numeric data obtained

from the SSIS Teacher Rating Scales suggested that he demonstrated an increase in five out of seven areas of social skills while experiencing no change in two of the seven areas. Subject 5 is described as a significantly challenged social communicator, and analysis of the numeric data collected from the SSIS Teacher Rating Scales indicated that he demonstrated an increase in four of the seven areas of social skills while experiencing no change in three of the seven social skills. An evaluation of the numeric data obtained from the SSIS Teacher Rating Scales for Subject 1, a nuance challenged-socially anxious social communicator, suggested he experienced no change in social skills.

Table 10 provides an overview of the analysis of numeric data collected from the SSIS Teacher Rating Scales for each of the five subjects: No. 1, No. 2, No. 3, No. 4, No. 5 and the subjects' levels of social communication. The data was recorded by the speech language pathologist who worked closely with the students. Challenged and significantly challenged social communicators demonstrated the greatest increase in social skills.

Table 10

Level of Social Communication and Post Social Skills Analysis

	No. 1 NC – SA	No. 2 C - OTC	No. 3 C - OTC	No. 4 C	No. 5 SC
Communication	0	0	+	+	+
Cooperation	0	0	0	0	+
Assertion	0	0	+	+	0
Responsibility	0	0	0	+	+
Empathy	0	0	+	+	0
Engagement	0	0	0	+	0
Self-Control	0	0	0	0	+

Notes: Abbreviations for levels of social communication are: E = Emerging, NC-SA = Nuance challenged/socially anxious, C-OTC = Challenged/on the cusp, C = Challenged, SC = Significantly challenged. Analysis of social skills indicates whether the subject demonstrated an increase (+), a decrease (-), or no change (0).

Table 11 provides an overview of the analysis of problem behaviors data collected from the SSIS Teacher Rating and is organized using a social communicator lens. Subject 1, a nuance challenged-socially anxious social communicator, experienced no change in problem behaviors. Subject 2, a challenged-on the cusp social communicator, experienced no change in problem behaviors. Subject 3, a challenged-on the cusp social communicator, demonstrated an increase in one problem behavior, a decrease in one problem behavior, and no change in three problem behaviors. Subject 4, a challenged social communicator, demonstrated a decrease in one problem behavior and no change in four problem behaviors. Subject 5 experienced a decrease in four problem behaviors and no change in one problem behavior.

Table 11

Level of Social Communication and Post Problem Behavior Analysis

	No. 1 NC – SA	No. 2 C - OTC	No. 3 C - OTC	No. 4 C	No. 5 SC
Externalizing	0	0	0	0	-
Bullying	0	0	0	0	-
Hyperactivity/ Inattention	0	0	0	0	-
Internalizing	0	0	+	0	0
Autism Spectrum	0	0	-	-	-

Notes: Abbreviations for levels of social communication are: E = Emerging, NC-SA = Nuance challenged/socially anxious, C-OTC = Challenged/on the cusp, C = Challenged, SC = Significantly challenged. Analysis of problem behaviors indicates whether the subject demonstrated an increase (+), a decrease (-), or no change (0).

Evidence of Quality

I demonstrated evidence of the quality of this mixed-methods research study by following the procedures outlined in Section 3. A community partner supervised the research project. Quantitative data were collected using the SSIS. The SSIS is a standardized rating scale that demonstrates a high degree of reliability and validity. The closed question format of the SSIS decreased interview bias and increased validity. Social skills data obtained from the SSIS were analyzed using a *t* test (Appendix A). Problem behaviors data from the SSIS was also analyzed using a *t* test (Appendix B). Both *t* tests were performed using SPSS. Field notes were recorded by a paraeducator (Appendix C) and a speech language pathologist (Appendix D). The field notes were transcribed and member checked. A sequential transformative strategy was used to analyze the quantitative and qualitative data. Field notes were analyzed through the lens

of seven social skills categories defined in the SSIS (communication, cooperation, assertion, responsibility, empathy, engagement, self-control) using a table. Competing problem behaviors impacting social skills were also included in the table. Triangulation of the data increased the validity of the study.

Summary of Findings

Quantitative data analyzed using a *t* test indicates an environmental service learning project did not have a significant effect on the increase of social skills or the reduction of problem behaviors for these six students with autism; however, numerical data and field notes indicate that the service learning project may have had a positive impact on the increase of social skills and reduction of problem behaviors for some of the students with autism. Analysis of numerical data obtained from the SSIS Teacher and Parent Rating Scales suggested three out of five students demonstrated an increase of social skills at school, and two out of five students experienced an increase of social skills at home. Although analysis of numeric data suggested Subject 1 did not experience a change in social skills, field notes indicated that he demonstrated an increase in leadership skills specifically in the areas of communication and responsibility. Analysis of the numeric data for Subject 2 also suggested that he did not demonstrate a change in social skills. However, field notes also indicated Subject 2 exhibited an increase in leadership skills specifically in the areas of communication and responsibility as well as in empathy. Analysis of the numeric data indicated Subject 3 demonstrated an increase in three out of seven areas of social skills at school and two out of seven areas of social

skills at home. Field notes suggested Subject 3 applies social skills most successfully in a structured environment. Evaluation of numeric data for Subject 4 suggested he experienced an increase in five out of seven social skills at school and at home. The common areas of increased social skills between the two settings are communication, assertion, responsibility, and engagement. Field notes also suggest that a structured setting increased Subject 4's ability to successfully utilize social skills. Subject 5 also experienced an increase in social skills in four out of seven areas at school and three out of seven areas at home. Field notes suggested a structured environment facilitated Subject 5 using expected social skills.

Analysis of numeric data obtained from the SSIS Teacher and Parent Rating Scales indicated one out of five students demonstrated a decrease in problem behaviors at school and one of four students experienced a reduction of problem behaviors at home. Subject 1's numeric data obtained from the SSIS Teacher Rating Scale indicated he did not experience a change in problem behaviors; however, field notes suggested he demonstrated an increase in self-control. Analysis of numeric data collected from the SSIS Teacher Rating Scales suggested Subject 2 did not experience a change in problem behaviors. Field notes support that hypothesis. However, analysis of the numeric data from the SSIS Parent Rating Scale indicated Subject 2 demonstrated a decrease at home in hyperactivity/inattention and an increase in internalizing and autism spectrum.

Analysis of Subject 3's numeric data collected from the SSIS Teacher Rating Scales indicated at school he demonstrated an increase in one area, a decrease in one

area, and stayed the same in three areas. Analysis of the numeric data obtained from the SSIS Parent Rating Scales suggested Subject 3's problem behaviors increased in three areas, decreased in one area, and stayed the same in one area. It appears that the service learning project did not influence an increase and/or decrease of behaviors at school and home.

The evaluation of the numeric data obtained from the SSIS Teacher Rating Scales indicated Subject 4 demonstrated a decrease in one out of five problem behaviors and experienced no change in four out of five problem behaviors. Both the Teacher Rating Scales and Parent Rating Scales indicated there was a decrease in autism spectrum behaviors. Analysis of Subject 5's numeric data obtained from the SSIS Teacher Rating Scales suggested he demonstrated a decrease in four out of five problem behaviors and experienced no change in one problem behavior. Evaluation of Subject 5's numeric data collected from the Parent SSIS Rating Scales indicated he demonstrated a decrease in two out of five problem behaviors, an increase in one out of five problem behaviors, and experienced no change in two out of five problem behaviors. Analysis of the data from both the Teacher and Parent rating scales suggested Subject 5 demonstrated a decrease in autism spectrum behaviors and experienced no change in internalizing behaviors both at school and at home.

Summary

Although quantitative data indicated that the service learning project did not have a significant effect on the acquisition of social skills and reduction of problem behaviors,

triangulation of quantitative and qualitative data suggested there may have been a

positive change. In Section 5, I will discuss the implications of the data and the

recommendations it suggests.

Section 5: Interpretations, Implications, and Conclusions

Introduction

The purpose of this mixed-methods study was to determine the effects an environmental service learning project had on the acquistion of social skills and reduction of problem behaviors for five elementary (kindergarten–Grade 5) students who have autism. Participating students were provided instruction in the *Growing Up Wild* curriculum. As a group, the students then chose four lessons, prepared the materials, rehearsed their roles, and then taught the lessons in a preschool classroom. Quantitative data were collected using the SSIS Teacher and Parent Rating Scales (Gresham & Elliott, 2008). Field notes, the qualitative component of the study, provided a greater understanding of students' experiences during the service learning project. Quantitative and qualitative data were analyzed using a sequential transformational strategy (Terrell, 2012). Findings from the study indicated there was no statistical significance in the increase of social skills or reduction of problem behaviors; however, evaluation of the numeric and qualitative data suggested there may have been a positive change.

Interpretation of Findings

Research Question 1

Research Question 1 asked: To what degree does a service learning project facilitate social skills improvement for students with autism? Data indicated no statistically significant change in social skills; however, analysis of the social skills numeric data obtained from the SSIS Teacher Rating Scale suggested there may have

been a positive change. Three in five students demonstrated an increase in social skills and two students experienced no change. Field notes indicated one of the subjects demonstrated an increase in leadership, specifically in communication and responsibility. These findings are supported by a study conducted by Hebert and Hauf (2015) that indicated college students participating in a service learning project self-reported an increase in leadership, verbal communication, and teamwork. Field notes also indicated the second subject also demonstrated an increase in leadership as well as in empathy. Research indicated that service learning can foster an increase in empathy as well as in community engagement (Scott & Graham, 2015).

Analysis of numerical data indicated that students with the most significant deficits in social communication demonstrated the greatest growth in social skills with Subject 4 (challenged social communicator) demonstrating an increase in five of seven areas of social skills and Subject 5 (significantly challenged social communicator) experiencing an increase in four out of the seven areas. These findings agree with the theory, "Behavior grows by multiplying – not adding" (Calkin, 2005). This theory is the foundation of the Standard Celeration Chart used in Precision Teaching (Calkin, 2005). For example, when a baby takes a first step everyone celebrates. As the baby adds two, three, four, and five steps at a time to their repetoire, he or she continues to receive praise. By the time the baby is taking 100 steps at a time the experience is no longer considered a great achievement. Therefore, when the students who were challenged or significantly challenged social communicators participated during Readers Theater or

interacted with peers and/or preschool students, this was a major step and cause for celebration. When students who were functioning at a higher social communication participated in these activities, the result was positive, but not as significant.

Analysis of the data indicated Subject 4 demonstrated an increase in social skills at school and home. Evaluation of the numeric data for the remaining three subjects indicates there was no correlation of skill acquisition from school to home. Transferring social skills to a new setting is often difficult for individuals who have autism (Wass & Porayska-Pomsta, 2014) and may account for students not generalizing social skills from the service learning setting, to the self-contained/school wide setting and/or home setting. In addition, service learning can affect individuals differently. Some students may report an immediate change in their interpersonal skills and others may need time to process the experience before making a change (Hullender, Henck, Wood-Nartker, Burton, & Bowlby, 2015). The results from this study indicated the students participating in the service learning project were able to generalize social skills they learned in class and transfer them to community based instruction in a service learning project (Laursen, Moor, Yazdgerdi, & Milberger, 2013); however, they had difficulty transferring them to a less structured setting such as home. Naturalistic Behaviour Intervention works from most structured social skills groups to less structured community based instruction to no structure as at home (Sowden, Perkins, & Clegg, 2011). Results of this study indicated students were able to generalize social skills from a structured setting to a less structured setting, but were not yet ready to transfer them to an unstructured setting.

Through this service learning project, students were able to develop a sense of belonging, whether it was being a leader during large and/or small group activities or as a participant during Readers Theater (Laursen & Yazdgerdi, 2012). In addition to acquiring a sense of belonging, students also experienced competency as they performed their role during Readers Theater (Fried, 2011). During the service learning project, subjects may have become more aware of their social setting which led to the increase in social skills (Gredley, 2015). Three out of five subjects demonstrated an increase in communication skills that facilitated social interactions critical to their developmental stage (Batra, 2013) and increased access to belonging to a group (Chun, Hertzog, Gaffney, & Dymond, 2011; Hildenbrand & Schultz, 2015). One of the students demonstrated an increase in engagement. Service learning facilitates engagement by giving students a voice in how the project operates (Laursen, 2014). For the low social communicator, this means being ready to read a part during Readers Theater can determine the outcome of the performance. Three of five subjects demonstrated an increase in the area of assertion on the social skills rating scale. This increase speaks to a student's self confidence and ability to speak up for himself. Qualitative data suggested the other two subjects demonstrated an increase in leadership skills which also indicates an increase in self confidence. Self confidence is one of four areas identified as significant areas of development impacted by service learning in a study conducted by Scott Lester (2015). A study conducted by Broome, Herd, Johnston, and Sevig (2015) also indicated students developed increased feelings of self worth while participating in service learning.

This research study is based on Maslow's Hierarchy of Needs and was focused on the following stages: love/belonging, esteem, and self actualization (Maslow, 1970). Results of the study indicated that all subjects participated in the service learning project and therefore had a sense of belonging to a group to some degree. Analysis of the data also indicated all of the participants demonstrated an increase in assertion and/or leadership skills which speaks to esteem on the hierarchy of needs. Numeric data and/or qualitative data indicated all subjects demonstrated at least some increase in social skills.

Research Question 2

Research Question 2 asked, to what degree does a service learning project reduce problem behaviors in students with autism? Quantitative data indicated there was no significant change in problem behaviors. However, evaluation of numeric data collected from the SSIS Teacher Rating Scales suggested there may have been a positive change in one of the students and four of the students experienced no change. The student who experienced a decrease in problem behaviors at school, also experienced an increase in social skills. The parallel of a decrease in problem behaviors and an increase in social skills appears to support the findings of Gresham, Van, and Cook (2006). Analysis of numeric data indicated the acquistion of social skills did not result in reduction of problem behaviors at school for the other four subjects. Evaluation of the numeric data from the SSIS Parent Rating Scales indicated no relationship between social skills and problem behaviors at home for four out of five subjects. No relationship between social skills attainment and problem behaviors reduction could be attributed to the brief length

of the project. Gresham et al. (2006) recommended an intense social skills training to reduce problem behaviors and increase social skills.

Implications for Social Change

As demonstrated in this study, service learning can lend itself as a holistic intervention to increase the quality of life for students who have autism. In this study participants worked with their team members to create and perform Readers Theater performaces for a preschool audience. This type of experience can promote a sense of belonging to a group thus helping to get their social emotional need for a sense of belonging met (Maslow, 1970). Subjects 2 and 3, higher level social communicators, demonstrated leadership skills in both large and small group activities. These experiences gave Subjects 2 and 3 social recognition for their leadership through an authentic experience (Maslow, 1970). Participants also developed a sense of pride in their accomplishments, for example during Readers Theater and as group leaders and were motivated to master new skills (reading fluency, public speaking) which are essential elements for the Industry vs Inferiority stage of Erickson's Theory of Eight Stages of Personality Development (Batra, 2013). Subject 5 summed up the experience with these words, "This was wonderful teacher _____."

Research also suggests there is a correlation between a student's beliefs about the importance of social skills and an increase in positive social skills and a reduction in problem behaviors (Kwon, Kin, & Sheridan, 2014). Service learning projects can provide students an opportunity to examine their own social skills and a platform to hone their

skills. This self-awareness supports students in developing a belief in the importance of social skills that will transfer to a posititve attitude about school.

Recommendation for Action

The potential relationship between a service learning project and the facilitation of social skills and reduction of problem behaviors has influenced the following recommendations. First, I will present the findings of this study to my colleagues in our district autism cadre. Implementing a service learning project provides an authentic activity in which to teach social skills as opposed to teaching them in isolation during social skills groups. I will also meet with district administrators, both special education and general education, to share the results of the study. Literature suggests that children's beliefs in the importance of social skills is essential for general education students as well as for students with special needs (Kwon et al., 2014). I will also seek out national venues to share the results of this study. Possible national professional conferences addressing issues of learning with students of autism may include the Social Thinking Providers Conference and Positive Behavior Interrventions Support Conferences.

Recommendations for Further Study

The study's findings that service learning may facilitate a positive change in social skills and problem behaviors would benefit from a more in-depth study. My recommendations for further study are as follows:

Replications

This study was limited in both time and the number of participants. Research suggests that students who participate in an intensive social skills training program of sixty hours demonstrate a large decrease in problem behaviors and an increase in social skills (Gresham, Van, & Cook, 2006). A larger sampling would increase the validity of the results and the potential for generlization (Creswell, 2008).

Further Examination

Service learning as a tool to facilitate social skills also needs to be further explored. After completing my research project, I conducted a boolean search through Eric, Education Research Complete, and Education Research Complete using the search words, service learning, special education, and elementary students from January 2010 through August 2015 and found current research limited. When I began my project, the literature indicated that implementing service learning to facilitate social skills appeared to be promising, but further research was needed. I plan to add my voice to those recommending more research in this area by publishing my study.

<div align="center">Conclusions</div>

Analysis of numeric data from the SSIS Teacher Rating Scales indicated there may have been a positive change in social skills and problem behaviors for some of the students who participated in an environmental service learning project. As a result of this study, I will continue to have my students participate in service learning projects in the preschool setting. This low cost/low impact intervention on school resources is an

accessible strategy for teachers to implement. Integrating service learning projects to facilitate social skills and reduce problem behaviors has the potential to help students meet essential needs such as developing a feeling of belonging and a sense of of pride so students will be able to reach the level of self-actualization.

References

Acar, C., & Diken, I. (2012). Reviewing instructional studies conducted using video modeling to children with autism. *Educational Sciences: Theory and Practice, 12*(4), 2731–2735. Retrieved from Education Research Complete Database.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders (text revision).* Washington, DC: Author.

Attwood, T. (2008). *The complete guide to Asperger's Syndrome.* London, UK: Jessica Kingsley Publishers.

Baio, J. (2012). Prevalence of autism spectrum disorders: Autism and developmental disabilities monitoring network, 14 sites, United States, 2008. *Morbidity and Mortality Weekly Report, 61,* 1–19. Retrieved October 21, 2012 from the World Wide Web:

www.cdc.gov/mmwr/preview/mmwrhtml/ss6103al.htm?s_cid=ss6103al_w

Baron-Cohen, S., Leslie, A., & Frith, U. (1986). Mechanical, behavioural and intentional understanding of picture stories in autistic children. *British Journal of Developmental Psychology, 4*, 113–125. doi:10.1111/j.2044-835X

Baron-Cohen, S. (1997). *Mindblindness.* Cambridge, MA: MIT Press.

Baron-Cohen, S., Tager-Flusberg, H., & Cohen, D. (2000). *Understanding other minds,* Oxford, NY: Oxford University Press.

Barron, J., & Barron, S. (1992). *There's a Boy in Here.* New York, NY: Simon & Schuster.

Batra, S. (2013). The psychosocial development of children: Implications for education and society – Erik Erikson in context. *Contemporary Education Dialogue, 10*(2), 249–278. doi: 10.1177/0973184913485014

Blake, K. (2011). Generalizing ABA treatment outside of sessions. *Brown University Child and Adolescent Behavior Letter, 27*(9), 1–7. Retrieved from Education Research Complete Database.

Briers, S. (2009). *Brilliant cognitive behavioural therapy.* Edinburgh Gate, UK: Pearson Education Unlimited.

Broome, J., Herd, K., Johnston, J., & Sevig, D. (2015). Experiences in multiage art education: Suggestions for teachers working with split class combinations. *Art Education, 68*(2), 30–35. Retrieved from Education Research Complete Database.

Brunner, D., & Seung, H. (2009). Evaluation of the efficacy of communication-based treatments for autism spectrum disorders: A literature review. *Communication Disorders Quarterly, 31*(1), 15–41. doi: 10.1177/1525740108324097

Buijsen, M., Hendrika, A., Ketelaars, M., & Verhoeven, L. (2011). Assessment of theory of mind in children with communication disorders: Role of presentation mode. *Research in Developmental Disabilities, 32*(3), 1038–1045. doi: 10.1016/j.ridd.2011.01.036

Calkin, A. (2005). Precision teaching: The standard celeration chart. *The Behavior Analyst Today, 6*(4), 207–215. Retrieved from Education Research Complete Database.

Campbell, A., & Tincani, M. (2011). The power card strategy: Strength-based intervention to increase direction following of children with autism spectrum disorder. *Journal of Positive Behavior Intervention, 13*(4), 240–249. doi: 10.1177/1098300711400608

Chafant, A., Rapee, R., & Carroll, L. (2007). Treating anxiety disorders in children with high functioning autism spectrum disorders: A controlled trial. *Journal of Autism and Developmental Disorders, 37*, 1842–1857. doi: 10.1007/s/0803-006-0318-4

Christ, T. (2013). The world view matrix as a strategy when designing mixed methods research. *International Journal of Multiple Research Approaches, 7*(1), 110–118. Retrieved from Education Research Complete Database.

Chun, E, Hertzog, N., Gaffney, J., & Dymond, S. (2011). When service learning meets the project approach: Incorporating service learning in an early childhood program. *Journal of Early Childhood Research, 10*(3), 232–245. doi: 10.1177/1476718X11430199

Cooper, J., Heron, T., & Heward, W. (2007). *Applied behavior analysis.* Upper Saddle River, NJ: Pearson.

Council for Environmental Education. (2011). *Growing up wild*. Houston, TX: Council for Environmental Education.

Courchesne E., Pierce, K., Schumann, C., Redcay-E., Buckwalter, J., Kennedy, D., & Morgan, J. (2007). Mapping early brain development in autism. *Neuron, 56*, 399–413. doi: 10/1016/j.neuron.2007.10/016

Creswell, J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Upper Saddle River, NJ: Pearson Education Inc.

Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousands Oaks, CA: Sage Publications, Inc.

Crooke, P., Hendrix, R., & Rachman, J. (2007). Measuring the effectiveness of teaching social thinking to children with Asperger syndrome (AS) and high functioning autism (HFA). *Journal of Autism and Developmental Disorders*, *38*, 581–591. doi: 10.1007/s10803-007-0466-1

Dahlgren, S., & Sandberg, A. (2008). Referential communication in children with autism spectrum disorder. *Autism, 12*(4), 335–348. doi: 10.1177/1362361308091648

Darretxe, L., & Sepulveda, L. (2011). Educational strategies to address the educational needs of student with Asperger syndrome in the mainstream classroom. *Education & Psychology, 24*, 1696–2095. Retrieved from Education Research Complete.

Dillenburger, K. (2011). The emperor's new clothes: eclecticism in autism treatment. *Research in Autism Spectrum Disorders, 5*, 1119–1128. doi: 10.1016/j.rasd.2010.12.008

Dominick, K., Davis, N., Lainhart, J., Tager-Flusberg, H., & Folstein, S. (2007). Atypical behaviors in children with autism and children with a history of language impairment. *Research in Developmental Disabilities, 28*, 145–162. doi: 10.1016/j.ridd.206.02.003

Donoghue, K., Stallard, P., & Kucia, J. (2010). The clinical practice of cognitive behavioural therapy for children and young people with a diagnosis of Asperger's Syndrome. *Clinical Child Psychology and Psychiatry, 16*(1), 89–102. doi: 10.1177/1359104509355019

Dymond, S., Renzaglia, A., & Slagor, M. (2010). Trends in the use of service learning with students with disabilities. *Remedial and Special Education*, *32*(3), 219–229. doi: 10.1177/0741932510362173

Eldar, E., Talmor, R., & Wolf-Zukerman, T. (2008). Successes and difficulties in the individual inclusion of children with Autism Spectrum Disorder (ASD) in the eyes of their coordinators. *International Journal of Inclusive Education, 14*(1), 97–114. doi: 10.1080/13603110802504150

Farrugia, S., & Hudson, J. (2006). Anxiety in adolescents with Asperger syndrome: Negative thoughts, behavioral problems, and life interference. *Focus on Autism and Other Developmental Disabilities, 21*(1), 25–35. Retrieved from Education Research Complete Database.

Fried, L. (2011). Teaching teachers about emotion regulation in the classroom. *Austrailian Journal of Teacher Education, 36*(3), 117–127. Retrieved from ERIC Database.

Frith, U. (2001). *Autism and Asperger syndrome*. New York, NY: Cambridge University Press.

Ganz, M. (2007). The lifetime distribution of the incremental societal costs of autism. *Pediatrics and Adolescent Medicine, 161*(4), 343–349. doi: 10.1001/archpedi.161.4.343

Gerhardt, P., & Garcia-Winner, M., 2012. *From applied behavior analysis to cognitive behavior therapy: Exploring who needs what, when and why.* Presented at the 2012 Social Thinking Providers Conference, San Francisco, CA.

Gray, C. (2010). *The new social story book*, Arlington, TX: Future Horizons.

Gredley, S. (2015). Learning through experience: Making sense of students' learning through service learning. *South African Journal of Higher Education, 29*(3), 243–261. Retrieved from Education Research Complete.

Gresham, F., & Elliott, S. (2008). *Social Skills Improvement System*, Bloomington, MN: Pearson.

Gresham, F., Elliott, S., Vance, M., & Cook, C. (2011). Comparability of the social skills rating system to the social skills improvement system: Content and psychometric comparisons across elementary and secondary age levels. *School Psychology Quarterly, 26*(1), 27–44. doi: 10.1037/a0022662

Gresham, F., Van, M., & Cook, C. (2006). Social skills training for teaching replacement behaviors: Remediating acquisition deficits in at-risk students. *Behavioral Disorders, 31*(4), 363–377. Retrieved from Education Research Complete Database.

Hebert, A., & Hauf, P. (2015). Student learning through service learning: Effects on academic development, civic responsibility, interpersonal skills, and practical skills. *Active Learning in Higher Education, 16*(1), 37–49. doi:10.1177/1469787415573357

Hildenbrand, S., & Schultz, S. (2015). Implementing service learning in pre-service teacher coursework. *Journal of Experiential Education, 38*(3), 262–279. doi:10.1177/1053825915571748

Hudock, R., Kashima-Ellingson, Y., & Bellini, S. (2011). Increasing responses to verbal greetings in children with autism spectrum disorders: A comparison of the effectiveness of social story and generic story intervention. *School Psychology Forum, 5*(3), 103–113. Retrieved from Education Research Database.

Hullender, R., Henck, S., Wood-Nartker, J., Burton, T., & Bowlby, S. (2015). Evidence of transformative learning in service-learning reflections. *Journal of Scholarship of Teaching, 15*(4), 58–82. doi: 10.14434/josotl.v15i4.13432

Karkhanen, M., Clark, B., Ospina, M., Seida, J., Smith, V., & Hartling, L. 2010. Social stories to improve social skills in children with autism spectrum disorder: A systematic review. *Autism, 14*(6), 641–662. doi: 10.1177/1362361310373057

Kasari, C., & Smith, T. (2013). Interventions in schools for children with autism spectrum disorder: Methods and recommendations. *Autism, 17*(3), 254–267. doi: 10.1177/1362361312470496

Koegel, R., Fredeen, R., Kim, S., Danial, J., Rubinstein, D., & Koegel, L. (2012). Using

    perseverative interests to improve interactions between adolescents with autism

    and their typical peers in school settings. *Journal of Positive Behavior*

    Interventions, 14(3), 133–141. doi: 10.1177/1098300712437043

Kokina, A., & Kern, L. (2010). Social story interventions for students with autism

    spectrum disorders: A meta-analysis. *Journal of Autism Developmental*

    Disorders, 40(7), 812–826. doi: 10.1007/s10803-009-0931-0

Kwon, K., Kim, E., & Sheridan, S. (2014). The role of beliefs about the importance of

    social skills in elementary children's social behaviors and school attitude. *Child*

    Youth Care Forum, 43, 455–467. doi: 10.1007/s/0566-014-9247-0

Lane, A., Dennis, S., & Geraghty, M. (2011). Further evidence of sensory subtypes in

    autism. *Journal of Autism and Developmental Disorders, 41*, 826—831. doi:

    10.1007/s10803010-1103-y

Laugeson, E., Frankel, F., Gantman, A., Dillon, A., & Mogil, C. (2011). Evidence-based

    social skills training for adolescents with autism spectrum disorders and the

    UCLA PEERS program. *Journal of Autism and Other Developmental Disorders,*

    42(6), 1025–1036. doi: 10.1007/s/10803-011-1339-1

Laursen, E. (2014). Respectful youth cultures: Reclaiming children and youth.

    Reclaiming Youth International, 22(4), 48–52. Retrieved from Education

    Research Complete Database.

Laursen, E., Moore, Yazdgerdi, S., & Milberger, K. (2013). Building empathy and social

   mastery in students with autism. *Reclaiming Youth International, 22*(3), 19–22.

   Retrieved from Education Research Complete Database.

Laursen, E., & Yazdgerdi, S. (2012). Autism and belonging. *Reclaiming Youth and*

   Children, 21(2), 44–47. Retrieved from Education Research Complete Database.

Lazzara, E., Shuffler, M., Rosen, M., Xavier, L., Wooten, S., Salas, E., Zaccaro, S., &

   Hilton, R. (2009). Identifying the best practices for critical thinking and

   metacognitive thinking training. *Proceedings of the Human Factors and*

   Ergonomics Society Annual Meeting, 53, 1378–1382. doi:

   10.1177/154193120905301845

Leaf, J., Dotson, W., Oppenheim-Leaf, M., Sherman, J., & Sheldon, J. (2011). A

   programmatic description of a social skills group for young children with autism.

   Topics in Early Childhood Education, XX(X), 1–11. doi:

   10.1177/0271121411405855

Lemmon, K. (2013). Alleviating anxiety in children and adolescents with autism

   spectrum disorders: Exploring the effectiveness of cognitive-behaviour therapy.

   New Zealand Journal of Teachers' Work, 10(1), 67–86. Retrieved from Education

   Research Complete Database.

Lerner, M., & Mikami, A. (2012). A preliminary randomized controlled trial of two

   social skills interventions for youth with high-functioning autism spectrum

   disorders. *Focus on Autism and Other Developmental Disabilities, 27*(3)*,* 147-

   157. doi: 10.1177/1088357612450613

Lester, S. (2015). Melding service learning and leadership skills development: Keys to

   effective course design. *Journal of Experiential Education, 38*(3), 280–295. doi:

   10.1177/1053825915576196

Levesque-Bristol, C., Knapp, T., & Fisher, B. (2010). The effectiveness of service-

   learning: It's not always what you think. *Journal of Experiential Education,*

   33(3), 208–224. Retrieved from Education Research Complete Database.

   (Accession No. 56583414)

Lind, S., & Bowler, D. (2010). Impaired performance on see-know tasks amongst

   children with autism: Evidence of specific difficulties with theory of mind or

   domain-general task factors? *Journal of Autism Development and Developmental*

   Disorders, 40, 479–484. doi: 10.1007/s10803-009-0889-y

Lodico, M., Spaulding, D., & Voegtle, K. (2010). *Methods in educational research:*

   From theory to practice. San Francisco, CA: John Wiley & Sons, Inc.

Lovitt, T. (2012). Applied behavior analysis: A method that languished but should be

   restored. *Intervention in School and Clinic, 47*(4), 252–256. doi:

   10.1177/1053451211424598

Ma, H. (2009). The effectiveness of intervention on the behavior of individuals with

    autism: A meta-analysis using percentage of data points exceeding the median of

    baseline phase (PEM). *Behavior Modification, 33*(3), 339–359. doi:

    10.1177/0145445509333173

Maslow, A. (1970). *Motivation and personality.* NY: Harper.

Matson, J., Gonzalez, M., & Rivet, T. (2008). Reliability of the autism spectrum disorder

    –behavior problems for children. *Research in Autism Spectrum Disorders, 2*(4),

    696–706. doi: 10.1016/j.rasd.2008.02.00

McDougall, J., Servais, M., & Meyer, K. (2009). A preliminary evaluation of a school

    support program for children with autism spectrum disorders: Educator and

    school level outcomes and processes. *Exceptionality Education International,*

    19(1), 32–50. Retrieved from Education Research Complete Database.

Meguid, N., Fahim, C., Yoon, U., Nashaat, N., Ibrahim, A., Mancini-Marie, A.,

    Brandner, C., & Evans, A. (2010). Brain morphology in autism and fragile X

    syndrome correlates with social IQ: First report from the Canadian-Swiss-

    Egyptian neurodevelopmental study. *Journal of Child Neurology, 25*(5), 599–608.

    doi: 10.1177/0883073809341670

Meyer, J., Mundy, P., Van Hecke, A., & Durocher, J. (2006). Social attribution processes

    and comorbid psychiatric symptoms in children with Asperger syndrome. *Autism,*

    10(4), 383–402. doi: 10.1177/1362361306064435

Morrison, R., Blackburn, A. (2008). Take the challenge: Building social competency in adolescents with Asperger's Syndrome. *Teaching Exceptional Children Plus, 5*(2), 1–17. Retrieved from Education Research Complete. (Accession No. 35629008)

National Youth Leadership Council. (2011). What is service learning? Retrieved October 21, 2011 from www.servicelearning.org/what-is-service-learning.

Neiworth, J. (2009). Thinking about me: How social awareness evolved. *Current Directions in Psychological Science, 18*(3), 143–147. Retrieved from Academic Search Complete.

Olnes, L. (2008). Special projects for special people: Students with disabilities serve others through service-learning projects. *Teaching Exceptional Children Plus, 5*(2), 1–13. Retrieved from Education Research Complete Database.

Orsmond, G., & Seltzer, M. (2009). Adolescent siblings of individuals with an autism spectrum disorder: Testing a diathesis-stress model of sibling well-being. *Journal of Autism and Developmental Disorders, 39*, 1053–1065. doi: 1007/s10803-009-0722-7

Ozdemir, S. (2008). Using multimedia social stories to increase appropriate social engagement in young children with autism. *The Turkish Online Journal of Educational Technology, 7*(3), 80–88. Retrieved from ERIC Database. (Accession No. ED502678)

Premack, D., & Woodruff, G. (1978). *Behavioral and brain sciences, 4*, 515–526.

Reiter, S., & Vitani, T. (2007). Inclusion of pupils with autism. *Autism, 11*(4), 321–333. doi: 10.1177/1362361307078130

Rotheram-Fuller, E., & MacMullen, L. (2011). Cognitive behavioral therapy for children with autism spectrum disorders. *Psychology in the Schools, 48*(3), 263–271. doi: 10.1002/pits.20552

Ryan, J., Hughes, E., Katsiyannis, A., McDaniel, M., & Sprinkle, C. (2011). Research-based educational practices for students with autism spectrum disorders. *Teaching Exceptional Children, 43*(3), 56–64. Retrieved from Education Research Complete Database.

Sansosti, F., & Powell-Smith, K. 2008). Using computer-presented social stories and video models to increase social communication skills of children with high functioning autism spectrum disorders. *Journal of Positive Behavior, Interventions, 10*(3), 162–178. Retrieved from Academic Search Complete Database. (Accession No. 32732486)

Sansosti, J., & Sansosti, F. (2012). Inclusion for students with high-functioning autism spectrum disorders: Definitions and decision making. *Psychology in the Schools, 49*(10), 917–931. doi: 10.1002/pits.21652

Schreiber, C. (2011). Social skills interventions for children with high-functioning autism spectrum disorders. *Journal of Positive Behavior Interventions, 13*(1), 49–62. doi: 10.1177/1098300709359027

Scott, K., & Graham, J. (2015). Service learning: Implications for empathy and community engagement in elementary school children. *Journal of Experiential Education, 38*(3), 1–19. doi: 10.1177/1053825915592889

Smith, L., & Elder, J. (2010). Siblings and family environments of persons with autism spectrum disorder: A review of the literature. *Journal of Child and Adolescent Psychiatric Nursing, 23*(3), 189–195. Retrieved from CINAHL Plus with Full Text Database.

Sofronoff, K., Attwood, T., Hinton, S., & Levin, I. (2007). A randomized controlled trial of a cognitive behavioural intervention for anger management in children diagnosed with Asperger syndrome. *Journal of Autism and Other Developmental Disabilities, 37*, 1203–1214. doi: 1007/x10803-006-0262-3

Sowden, H, Perkins, M., & Clegg, J. (2011). Context and communication strategies in naturalistic behavioural intervention: a framework for understanding how practitioners facilitate communication in children with ASD. *Child Language Teaching & Therapy, 27*(1), 21–38. doi: 10.1177/0265659010369990

Steen, S., O'Keefe, A., Griffin, D., & Routzahn, K. (2012). Service-learning and classroom guidance: A program for elementary students. *Journal of School Counseling, 10,* 1–31. doi: Retrieved from Education Research Complete Database.

Stichter, J., O'Connor, Herzog, M., Lierheimer, K., & McGhee, S. (2012). Social

    competence intervention for elementary students with Aspergers syndrome and

    high functioning autism. *Journal of Autism and Other Developmental Disorders,*

    42, 354–366. doi: 10.1007/s/10803-011-1249-2

Storey, K. (2004). The case against the Special Olympics. *Journal of Disability Policy*

    Studies, 15(1), 35–42. Retrieved from Education Research Complete Database.

Strain, P., & Schwartz, I. (2001). ABA and the development of meaningful social

    relations for young children with autism. *Focus on Autism and Other*

    Developmental Disabilities, 16(2), 120–128. Retrieved from Education Research

    Complete Database.

Strain, P., Schwartz, I., & Barton, E. (2011). Providing interventions for young children

    with autism spectrum disorders: What we still need to accomplish. *Journal of*

    Early Intervention, 33(4), 321–332. doi: 10.1177/1053815111429970

Strang, J., Kenworthy, L., Daniolos, P., Case, L., Wills, M., Martin, A., & Wallace, G.

    (2012). Depression and anxiety symptoms in children and adolescents with autism

    spectrum disorders without intellectual disability. *Research in Autism Spectrum*

    Disorders, 6, 406–412. doi: 10.1016/j.rasd.2011.06.015

Sung, M., Ooi, Y., Goh, T., Pathy, P., Fung, D., Ang, R., Chua, A., & Lam, C. (2011).

    Effects of cognitive-behavioral therapy on anxiety in children with autism

    spectrum disorders: A randomized controlled trial. *Child Psychiatry and Human*

    Development, 42, 634–649. doi: 1007/s/10578-011-0238-1

Terrell, S., (2012). Mixed methods research methodologies. *The Qualitative Report, 17*(1), 254–280. Retrieved from ERIC Database.

Thompson, T. (2013). Autism research and services for young children: History, progress and challenges. *Journal of Applied Research in Intellectual Disabilities, 26*, 81–107. Retrieved from Education Research Complete Database.

Tillman, J., Clemence, A., & Stevens, J. (2011). Mixed methods research for pragmatic psychoanalytic studies. *Journal of the American Psychoanalytic Association, 59*(5), 1023–1040. doi: 10.1177/0003065111418650

Tse, J., Strulovitch, J., Tagalakis, V., Meng, L., & Fombonne, E. (2007). Social skills training for adolescents with asperger syndrome and high functioning autism. *Journal of Autism and Developmental Disorders, 37*, 1960–1968. doi: 10.1007/s10803-006-0343-3

Vermeulen, P. (2012). *Autism as context blindness*. Lenexa, KS: AAPC Publishing Co.

Wass, S., & Porayska-Pomsta, K. (2014). The uses of cognitive training technologies in the treatment of autism spectrum disorders. *Autism, 18*(8), 851–871. doi: 10.1177/1362361307078130

White, S., Koenig, K., & Scahill, L. (2010). Group social skills instruction for adolescents with high functioning autism spectrum. *Focus on Autism and Other Developmental Disabilities, 25*(4), 209–219. doi: 10.1177/1088357610380595

Winner, M. (2007). *Thinking about you, Thinking about me.* San Jose, CA: Social Thinking Publishing.

Appendix A: SPSS Social Skills Data

T-TEST PAIRS=PreParent PreTeacher WITH PostParent PostTeacher (PAIRED)
 /CRITERIA=CI(.9500)
 /MISSING=ANALYSIS.

T-Test

Notes

Output Created		23-MAY-2015 17:04:59
Comments		
Input	Data	/Users/beckyhendrickson/Documents/Becky's Data/Social Skill Scale.sav
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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	7
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST PAIRS=PreParent PreTeacher WITH PostParent PostTeacher (PAIRED) /CRITERIA=CI(.9500) /MISSING=ANALYSIS.
Resources	Processor Time	00:00:00.01
	Elapsed Time	00:00:00.00

[DataSet0] /Users/beckyhendrickson/Documents/Becky's Data/Social Skill Scale.sav

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreParent	81.8000	5	8.70057	3.89102
	PostParent	83.2000	5	6.76018	3.02324
Pair 2	PreTeacher	84.3333	6	13.45610	5.49343
	PostTeacher	86.8333	6	10.92551	4.46032

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PreParent & PostParent	5	.766	.131
Pair 2	PreTeacher & PostTeacher	6	.985	.000

Paired Samples Test

		Paired Differences					T
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	PreParent - PostParent	-1.40000	5.59464	2.50200	-8.34666	5.54666	-.560
Pair 2	PreTeacher - PostTeacher	-2.50000	3.27109	1.33542	-5.93279	.93279	-1.872

Paired Samples Test

		Df	Sig. (2-tailed)
Pair 1	PreParent – PostParent	4	.606
Pair 2	PreTeacher – PostTeacher	5	.120

Appendix B: SPSS Problem Behavior Data

T-TEST PAIRS=PreParent PreTeacher WITH PostParent PostTeacher (PAIRED)
 /CRITERIA=CI(.9500)
 /MISSING=ANALYSIS.

T-Test

Notes

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	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	7
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST PAIRS=PreParent PreTeacher WITH PostParent PostTeacher (PAIRED) /CRITERIA=CI(.9500) /MISSING=ANALYSIS.
Resources	Processor Time	00:00:00.01
	Elapsed Time	00:00:00.00

[DataSet1] /Users/beckyhendrickson/Desktop/Problem Behaviors Scale.sav

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PreParent	117.0000	5	4.18330	1.87083
	PostParent	120.8000	5	7.46324	3.33766
Pair 2	PreTeacher	125.1667	6	6.61564	2.70082
	PostTeacher	124.0000	6	5.13809	2.09762

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	PreParent & PostParent	5	.809	.097
Pair 2	PreTeacher & PostTeacher	6	.947	.004

Paired Samples Test

		Paired Differences					T
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	PreParent - PostParent	-3.80000	4.76445	2.13073	-9.71585	2.11585	-1.783
Pair 2	PreTeacher- PostTeacher	1.16667	2.40139	.98036	-1.35344	3.68677	1.190

Paired Samples Test

		df	Sig. (2-tailed)
Pair 1	PreParent – PostParent	4	.149
Pair 2	PreTeacher – PostTeacher	5	.287

Appendix C: Paraeducator Field Notes

Service Learning – Paraeducator – 2/26/15

10:24 (Read aloud, Gone Fishing, fishing station, habitat puzzle station, goldfish cracker sorting station).
- Subjects 4, 1, 7, 3 followed directions. They came into the room in a line, quiet and sat right down where FOSS Teacher asked them to. Subject 2 followed behind and sat in the "teacher chair." Subject 2 began to read book to preschool class.
- Student interrupted and Subject 2 paused and continued to read the story without frustration.
- Subject 2 misread a page and re-read while looking at FOSS Teacher for prompt.
- Subject 2 asked if there were any question and calmly picked on students one by one those that raised their hands.
- Subject 2 started to get excited about singing the song. Two shouts out loud about the song and how it's like the "bear hunt" song. FOSS Teacher proceeded to start the song and K followed her cue promptly.
- Subjects 1,4,3 sing song, with hand movements, looking at students in front of them.
- Subject 7 looked at FOSS Teacher up to his right the whole time.
- Subject 2 interrupted at the end of song to say "you have a nice classroom." FOSS Teacher prompted him to sit down at a different spot. While she gave instructions to break into groups,

10:30 (small group activity)
- Preschool Teacher asks her students to list what things they see in habitats.
- Subject 1 explains his group activity.
- Subject 7 explains his group activity – catching fish.
- Subjects 4,3 help measure.
- FOSS Teacher takes Subjects 7,3,4 into to their respective spots. Subject 7 sits behind poster board where he helps students catch the fish.
- Subjects 4,3 help measure the fish they caught.
- Subject 2 welcomes everyone to his table – one girl says she wants to sit by him. He says, "I like you." She says, "I like you too." "We're friends", he says.
- Subject 2 shows what they're going to do, asks if there are any questions, and lets them begin.
- Subject 4 is calm, quiet, and takes the fish the student gives him and measures it.
- Subject 1 helps four students count their goldfish crackers and line them up in categories of color. He has calm tone of voice and body language.

- Subject 2 voice is getting raised as it's time for groups to transition. Other preschool teacher is there and he looks at her three times.
- FOSS Teacher moves to her students groups to prompt transition. Subject 3 wanders around the room. Subjects 4,7 stay in their areas.

10:48
- Subject 2 is trying to wrap up his group. He says he will give them 30 seconds and counts down out loud.
- Subject 2 walks around the room.
- FOSS Teacher switches Subject 3 and Subject 7. Subject 7 & Subject 4 will help measure fish caught. Subject 3 is at the fishing station.
- Subject 3 needs help from FOSS Teacher to get the fish attached.
- Subject 7 & Subject 4 are working well together to measure the fish caught. Subject 7 interacts will with the students asking them what their names are gets down on their level (eye to eye).
- Subject 1 has teacher K help instruct their group on counting & sorting fish crackers. Subject 1 helps as well as eats some of the goldfish crackers.
- Subject 2 has an elevated volume when speaking but starts to calm down as he explains step by step what they need to do.
- Subject 3 is smiling and helping the students "catch" fish and then instructs them to go to the next station.
- Subject 2 begins to fall out of his chair to be funny.
- FOSS Teacher walks over and speaks to Subject 2, saying "that is unexpected."

11:03
- As the groups transition, Subject 1 is more active in helping the students clean up & give instructions.
- Subject 2 goes to play at the kitchen play area.
- Subject 4 is standing by FOSS Teacher waiting for instruction.

1:24 Afternoon Session
- Subject 2 has been very stuck for about 30 minutes prior to going to the preschool so FOSS Teacher has a "special job" for Subject 2. He is to pass out sheets of paper on 3 tables while Subject 3 reads the story to the class. He does it well and without disagreeing.
- Subject 3 reads the story while Subject 7 and Subject 1 sit and listen while finishing coloring their habitat.
- During the song portion – FOSS Teacher sings the song. Subject 3 and Subject 7 sing the song as well as perform hand movements. Subject 2 begins the singing and hand movements towards the end.
- Subject 1 is annoyed with how close Subject 2's chair is to his leg. He starts shaking the leg of the chair. Para asks Subject 1 to sit back. Subject 2 begins to

move his hand in front of Subject 1's face during the hand movements part of the song. Para says, "Subject 2 no." He apologizes and stops unexpected behavior.
- Beginning to transition and break into groups Subject 2 doesn't want to pick one of the 3 tables where group activity will be. He tells 1:1 para that he doesn't want to participate and that FOSS Teacher won't listen to him. 1:1 para convinces Subject 2 to just take a walk outside to get some fresh air. FOSS Teacher decides she better go with him to assist in de-escalation.
- Subject 7 helps everyone sit at his table but is distracted by the fact that he hasn't finished coloring his own habitat yet. Subject 7 walks around looking for crayons because his table only has colored pencils.
- Subject 3 works well with his group helping the kids color their habitat.
- Subject 1 has a large group of six students and is doing well with instructions but begins to get frustrated when the kids begin to glue before everyone is done coloring. Preschool Teacher comes over to assist and explains that for younger students it's harder to wait.
- Subject 3 is doing excellent, offering helpful suggestions, helping piece the puzzle together. He keeps a calm tone of voice and seems almost like a different kid with his level of patience. Subject 3 offers words of encouragement, "you're doing great!" "You're almost done!"
- Subject 1 is doing well with the level of noise and talking at his table.
- Subject 7's group finished early and left his table. Subject 7 is now coloring his habitat and gluing his puzzle pieces.
- Para #2 took FOSS Teacher's place in the classroom.
- Subjects 7, 1, 3 transitioned well out of the classroom and into the next task.

Time ended @ 2:06 pm.

SL – Paraeducator – 3-5-15 Spider Book (readers theater) & Weaving Webs w/preschool

10:45 Groups are formed.
- Subject 2 level 1 leader with Subject 4 assisting.
- Subjects 1,7,6 in one group.
- Subjects 3,5 in the third group.
- Subject 2's string fell off so he asked for FOSS Teacher for assistance.
- Subject 3 praised one of his students and said, "you are a rock star!" "You finished your web."
- Subject 1 is working quietly weaving his web.
- Subject 5 is sitting quietly at the outside of his group with quiet hands and voice. He seems to be more interested in the fabric covering the bookshelf next to him, as that is where his eyes are.
- Subject 3 helps the students finish their webs.

- Subject 2 if feeling a bit overwhelmed. He puts his head into his hands and takes a deep breath. He shouts out twice to the FOSS Teacher. FOSS Teacher responds with "one minute Subject 2, I'll be right there." Subject 2 seems to calm down in one minute. His facial expressions and tone of voice become relaxed and he is close to baseline. Subject 4 has a calm voice the entire time and sits with calm and quiet body language.
- Subject 6 sits in a chair quietly with a para assisting him with weaving his web. He is very focused with calm & quiet body language even after the para redirects her attention to another student.
- Subject 3 stays with his group until everyone in his group has finished weaving their web.
- Subject 4 assists the kid next to him when the student asks for help.
- Subject 2 is shouting out with two of the students names saying I think you forgot your web. He remains sitting.
- Subject 5 crawls over to classroom para and asks for a hug. Hug given and he walks away.
- Subject 7 sits quietly the entire time looking for direction from FOSS Teacher often.
- Subject 1 is finished and leans against the door.
- All of the students remain seated throughout the web weaving project.

PM Preschool Observation
- Role change – Subject 1 opted not to participate. Subject 3 was the weaver of the web during the story.
- Subject 6 didn't want to read his part at first, but with a quick prompt from FOSS Teacher, he read and quickly moved out of the way for the next person in line.

1:36 pm
- Subjects 2,5 at purple table with 5 students.
- Subjects 3,4 at the green table with 5 students.
- Subject 4 is sitting at his table with quiet hands & voice, working on his web because the needle keeps falling off.
- Subject 6 didn't get a needle because they ran out but had a flexible brain and sat quietly.
- Subject 2 towards the end played with scissors and got Subject 7's attention and said, "Hey Subject 7, look I'm Edward Scissor Hands!"
- Subject 5,7 wander around the room after all the students left their table.
- Subject 6 remains at his table until everyone lines up.

1:43 pm
- Subject 2 plays at kitchen.

- Subjects 7,5 are lined up.
- Subject 3 is talking to Preschool Para
- Subject 4 stands in line.
- Para has to prompt Subject 2 to line up. He postures and elevates his voice. 1:1 para intervenes and he responds to her and gets in line. She asks him to close his eyes and take 5 deep breathing techniques. Works well and he transitions to his desk.

1:45 pm
- Subject 6 lines up and sits at his desk
- Subjects 3,7 walk and sit at FOSS Teacher's table.
- Subjects 4,5 transition well.

SL – Paraeducator – 3/12/15 Worms (poem & worm observation)
10:36 am
- Subject 2 walks in on tip toes with a smile on his face, "welcome club", he says. "Today is all about worms and to start off I'm going to read a poem." He finishes and tells the preschoolers "for safety guys, don't eat real worms." He tells them in the picture the boy is eating a gummy worm.
- Subject 5's attention is on the other side of the room @ white board.
- Subject 4 reads/sings the song with FOSS Teacher's prompt.
- Subject 2 is enthusiastic about the song. Calm body.
- Subject 3 tells the students we're going to look at the worms. Subject 2 wants to clarify that the students can ask questions.

10:41 am
- Students break into groups
- Subject 3 is group leader
- Subjects 2,4 in another group
- Subject 5 sits calmly until he is called. Subjects 5,7 in another group.
- Subject 2 asks who wants to wear gloves, "one at a time."
- Subject 3 begins to tell all the facts about worms. Subject 4 doesn't really interact a whole lot verbally but his attention is on Subject 3 and his group. Subject 3 has his group nicely around the table. His group is very interested and engaged with their body language as well as keeping them interested by telling them to look at stuff.
- Subject 2's voice is getting elevated and Preschool Paraeducator calmly walks over to prompt him to stay calm.
- Subject 7's group – Subject 5 is distracted. Subject 7 is engaged with his group but quiet. Two preschoolers break away.

- Subject 2 sprays his face over 5 times with water spray bottle. Subject 2 needs to be prompted several times to listen to directions. He remains at an excited/wired level and used breathing techniques several times to keep himself from escalating.
- Subjects 3,7 are quick to help clean up via FOSS Teacher's prompt. Subject 2 is distracted and runs around the playground and responds with, "I'm taking a short cut."

1:23 After Preschool Class
- Subject 2 was playing in the play kitchen but got right on task when it was time to start.

1:32 pm
- Subject 2 started with opening, "raise you hands if you like worms." Today we're talking about worms. Subject 2 read a book.

1:34 pm
- Subject 4 begins the song. Subject 2 joins in the song but sits at the back of the room.
- Subjects 5,3 don't sing but have calm bodies.
- Subject 6 is siting on a chair with the group but is in his own world – not paying attention and jumping in and out of his chair.
- Subjects 3,6 break out into groups @ 1:38 pm.
- Subject 5 stands up waiting for his group. Subject 5 stands facing his group and marches outside to the worm activity. He does great.
- Subjects 4,7 had calm bodies, did well with some quiet interaction with other students.

1:50 pm
- Preschoolers go inside. Subjects 6,4,2 are running around playing.

SL – CW – 3/19/15
10:37 am
- Subject 2 asked FOSS Teacher if he could tell the kids what they're learning today. Subject 2 introduces the topic.
- Subject 1begins to read the story.
- Subject 6 is prompted to sit in a chair & he does quietly until it's his turn to read. The other students are lined up quietly in the room. Subject 6 reads his part well and sits down in his chair with prompts from FOSS Teacher to sit still.
- Subject 4 read his part and then talks about the picture he drew.
- Subject 3 reads loudly and clearly appropriately for his audience.
- Subject 2 reads well – with clear and positive pronunciation.

- Subject 7 reads well and shows picture – he is clearly trying to read loudly and with clarity.
- After the story is over, Subject 2 pushes his way out of the line and asks FOSS Teacher if he can tell the preschoolers what they're doing next. Subject 2 introduces the activity, "whose excited about planting seeds?" he says with great enthusiasm.

10:44 pm groups break out for planting activity
- Subjects 7,6 lead one group
- Subjects 5,3 lead another group. Subject 3 asks Subject 5 to wait for their group. Subject 3 says, "I know you didn't like what you we did last time with the worms but today we're going to learn about seeds."
- Subjects 2,4 lead another group. Subject 2 wants everyone to held hands as they walk out.
- Subject 6 is in his own world, dancing around. FOSS Teacher asks if he wants to help Subject 7 with their group. He says yes and he helps out at his assigned table.
- Subject 2 is moving around the table making sure all of the kids have their seeds.
- Subject 3 has a great tone of voice and is making sure all of the kids in his group have their names of the cartons. Subject 5 plays in the dirt.
- Subject 4 is prompted 3 times to join Subject 2 in participating.

10:55
- Subject 7's group is the first to break for lunch. Subject 7 yells out, "I'm all done Ms. _____(FOSS Teacher). Subject 6 is dancing around.
- Subject 2's voice got elevated 5 times. His body language has greatly improved from other service learning project. He kept flat feet and non-posturing postures 85% of the time.
- Subjects 5,4 are prompted to come back and not play at playground. Later on Subject 5 sees Subject 4 playing at playground and yells," Subject 4! come back."

11:00 am
- Subject 3 takes his group in.
- Subjects 2,6,5,4 are playing around.
- Subject 7 is helping Subject 3's table plant their seeds better (everyone has left).

1:25 pm Afternoon Preschool Class
- Everyone is lined up and ready to begin.
- Subject 2 gets the preschoolers excited by explaining what they will do.
- Subject 6 sits himself in his chair by the group. He jumps in and out of his chair but calms down as the reading begins.
- Subject 4 reads very quietly.

- Subject 6 read well.
- Subject 5 read very quietly. While waiting in the other room, Subject 5 begins talking and his older peers promptly yell, "shh."
- Subjects 4,7,2 read very clearly, appropriate volume and with confidence.
- Subjects 4,7,2 really take charge in keeping their younger peers quiet.

1:35 pm – break into groups
- Subject 2 grabs Subject 4's hand to let him know he's in his group and to keep Subject 4 focused.
- Subject 5 follows behind his group. Once outside, Subject 5 begins to be involved in his group, spraying water in their containers.
- Subject 7 leads his group.
- Subject 3 talks about the ALS Ice Bucket Challenge.
- Subject 6 goes back to class. He was over stimulated and stimming.
- Subject 3 gives a lot of verbal encouragement, "You're doing great!"

1:45 pm activity ends
- Subjects 3,7 are totally focused and on task when the preschoolers leave by cleaning up their areas and take the trays with the milk carton planters into the preschool room.
- Subject 4 (with prompt) helps clean up the table areas outside.
- Subject 2 eventually on his own offers to help clean up.
- Subject 5 is playing around and says, "this was wonderful" to the FOSS Teacher.
- Things are clean up at 1:50 pm.

Appendix D: Speech Pathologist Field Notes

SL – SLP – 2/26/15
- Subject 7 – trying to engage but kids with are demonstrating unexpected behavior and he is a bit flummoxed. Helped out, reassured child.
- Subject 3 (measure fish) – engaged with student 1:1. Smiling & enjoying his task.
- Subject 1 – assisted by teacher. Calm, good directions. He helped student sort. Stamina for commitment decreased. Needed to be reminded, "this is your job". Verbally stated that he was "bored."
- Subject 2 – invited students to sit. Sweet & cute. Compliments/encouragement. Attempts to offer constructive criticism.
- Subject 4 (measuring fish) – assisting but not much language. Some mild interaction with kids. Zoning out from time to time.

2/26/15 Afternoon
- Subject 7 – Engaged. Got up to share seat with child who didn't have one. Group finished first. When alone – scripting or singing.
- Subject 3 – Patient, solicitous. Showed book and read it. Engaged. Gave instructions and made suggestions. Offered encouragement and praise.
- Subject 1 – A bit demanding on details. Having difficulty from coloring to song. Not engaged entirely (on/off/on/off). Pulled out chair for child. Was in teacher mode – stern but also gentle speech. Off topic during activity.
- Subject 2 – not singing at first. Observing kids and most engaged. Flagging, struggling to hold it together.

SL – SS – 3/5/15 – AM Preschool Class
- Subject 2– observed a bit of frustration (3 times), controlling words and actions. Subject 2 was offering encouragement. He had the most interaction with students. He remembered their names.
- Subject 3 – Tuning in and out at first then offering encouragement, "you are a rock star!"
- Subject 4 – very little instruction with students. Looking but no words or assistance.
- Subject 1 – frustrated, mild interaction. Spacing out after done.
- Subject 7 – attending to task but not much interaction with students. Eye contact but very few words.

3/5/15 PM Preschool Class
- Subject 4 read two times. Absorbed in task.

- Subject 3 – Absorbed in task. Unaware that his comments are poorly times during reading. Doesn't know when someone needs help.
- Subject 6 – read his part with support. No interaction with kids.
- Subject 2 – read three times. Difficulty holding it together. Signs of anxiety.
- Subject 1 – having a melt down
- Subject 7 – read three times. Not really interacting with kids without prompt.
- 5 – read his part. No engagement. Playing with gum and staring at ceiling. (needs to work on articulation).

SL – SS – 3/12/15
- Subject 2 – Read a poem. Sat in front of class and talked. Offered a safety tip. Pushed on with questions.
- Subject 3 – appeared confortable with group. Wanted the kids to know facts about worms.
- Subject 5 – No interaction verbally with students.
- Subject 7 – quietly in charge. Not much interaction verbally.
- Subject 4 – sang song to class with direct assists. Offered comments. K was in charge.

3/12/15 PM Preschool Class
- Subject 2 – same as morning. Difficulty delegating.
- Subject 4 – sang worm song
- Subject 5 – initially listened
- Subject 6 – listened – liked the song
- Subject 3 – listening – leader at worm activity
- Subject 7 – outside setting up during opening poem & song

SL – SS – 3/19/15 AM Preschool Class
- Subject 2 – good presence – did the intro. Read three times. Holding kids hands. Very bossy at times. K & J were team leaders.
- Subject 5 – Read his card. In the same group as N. S needs support but remembers some of what to do.
- Subject 4 – read three parts. Elaborated an answer. Really into project.
- Subject 7 – read three parts. C & M on same team. C interacted with M. C watches but has limited interactions. Interactions increase when adult is present. Greetings – good. Cleaned up his area – informed teacher of status. Pointed out to N that they were not done.

- Subject 3 – read three parts. N & S are a team. Good interactions with kids. Listens and interacts with his students.
- Subject 1 – read three parts with adult support.
- Subject 6 – read his part with support. Mostly oblivious to what was happening. Some brief attention to team.

SL – SS – 3/19/15 PM Preschool Class
- Subject 2 – Did the intro. Read two parts.
- Subject 4 – Read two parts with a quiet voice. Not aware of audience needs.
- Subject 3 – Read three parts.
- Subject 5 – Read two parts. More involved than N this session offering encouragement.
- Subject 7 – Read three parts – good inflection. Totally focused and attending to task.
- Subject 6 – Having trouble keeping body calm. Took a bow. Went back to class.
- Subject 1- Read three parts. Voice is quiet and with little feeling. Participation ends with reading.