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The Effectiveness of a Social Thinking Curriculum in Facilitating Social Competence of Young Children with Autism Spectrum Disorders

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ACCEPTANCE

This dissertation, THE EFFECTIVENESS OF A SOCIAL THINKING CURRICULUM IN FACILITATING SOCIAL COMPETENCE OF YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDER, by BROOKS LACEY PETERS was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

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THE EFFECTIVENESS OF A SOCIAL THINKING CURRICULUM IN FACILITATING SOCIAL COMPETENCE OF YOUNG CHILDREN WITH AUTISM SPECTRUM DISORDER

by

BROOKS LACEY PETERS

Under the Direction of Peggy A. Gallagher, Ph.D.

ABSTRACT

A lack of social competence is one of the primary characteristics of children diagnosed with autism spectrum disorder (ASD). This pervasive lack of social competence can cause individuals with ASD to struggle to develop meaningful social relationships with peers and adults across their lifetime. Thus, learning appropriate socialization skills is an essential component in the education of this population. The purpose of the current study was to provide an initial investigation into the effectiveness of a comprehensive social skills training intervention on the social competence of young children with ASD using direct recording methods. Eight students with ASD between the ages of 5 and 7 years, with current placements in self-contained kindergarten or first grade classrooms in the public school setting participated in a 12 week intervention. The intervention implemented was

"The Incredible Flexible You: A Social Thinking Curriculum for Preschool and Early Elementary Years" (Hendrix, Palmer, Tarshis, & Winner, 2013), a packaged, multi-sensory social skills training program developed to promote the social competence of young children with ASD. The intervention was presented daily for approximately 20 minutes in a small group school setting. Using a concurrent multiple baseline across participants single-case research design, the research study aimed to evaluate the effectiveness of the program upon the participant's positive social initiations, positive social responses, and active engagement during recess. Observational data were collected utilizing both a frequency behavior count system and a timed interval behavioral observation system. Additionally, data were collected via the Autism Social Skills Profile (ASSP; Bellini & Hopf, 2007) through pre- and post-intervention parent forms to determine the effects of the program on the overall social functioning of the participants. Procedural fidelity was collected throughout the research, and social validity was also assessed utilizing the Behavior Intervention Rating Profile (BIRP, Von Brock & Elliott, 1987). Overall, participants made slight gains in social competency, yet the data did not support a functional relation between the intervention and dependent variables. Individual participant progress was discussed in detail. Limitations of the study and implications for practice and future research in social competency for young children with ASD were further discussed.

INDEX WORDS: Autism spectrum disorder, Social skill competence, Disabilities

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1 STATEMENT OF THE PROBLEM

INTRODUCTION

Autism spectrum disorder is the fastest growing developmental disorder diagnosed by pediatricians in the U.S. (Center for Disease Control, 2014) and has been ranked as the second most incapacitating disorder by the Center for Disease Control (CDC, 2010). Despite the recent increase in diagnoses, children identified with an autism spectrum disorder (ASD) make up approximately only 6 percent of students provided special education services in public schools under the "autism" classification of the *Individuals with Disabilities Education Act* (U.S. Department of Education, 2013). However, it is plausible that this figure is an underestimate of children with ASD serviced by the public schools in the U.S., as many of the diagnosed population are serviced under the IDEA classifications of "significant developmental delay", "other health impairment," "emotional disturbance", or "speech and language impairment".

People identified with ASD exhibit concurrent deficits in socialization, receptive and/or expressive language, and the presentation of restricted interests and repetitive behaviors (DSM-5, 2013). These behavioral deficits are further complicated by documented insufficiency in perspective taking, executive functioning, and the development of central coherence (Baron-Cohen et al, 1985; Frith, 1998; Landa & Goldberg, 2005). Consequently, these students are often targeted for specialized instruction through speech/language therapy, social skills interventions, supplementary aids and services, and placement within special education programs within the public school environment (Winner, 2008). The U.S. Department of Education reported that 37% of students in the public school system serviced under the IDEA classification of "autism" participate in the general education classroom for more than eighty percent of their school day (U.S. Department of Education, 2013). As a result, therein lies a critical need for daily targeted

interventions to address the core deficits displayed by students with ASD, beginning in early childhood, in order to assist in socially interacting with neurotypical peers in the later years (Maley, 2003).

Significance of the Problem

ASD is being diagnosed by pediatricians throughout the U.S. at the alarming rate of 1 in 68 children (CDC, 2012). The U.S. Department of Education, National Center for Education Statistics (2013) reported that the number of school-age children diagnosed with autism that are receiving any of the continuum of special education placement options rose drastically from approximately 94,000 in 2000-2001 to 417,000 in 2010-2011. This reflects a startling increase of over 450% in ten years. ASD occurs in all racial subgroups and across all socioeconomic backgrounds. Historically, research has shown a significantly higher instance of diagnoses in boys rather than girls (CDC, 2012). ASD describes a continuum of neuro-developmental disorders defined by the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5, 2013). In previous editions, four disorders that fell under the umbrella of an ASD diagnosis were autistic disorder, Asperger syndrome, childhood disintegrative disorder, and Pervasive Developmental Delays-Not Otherwise Specified (APA, DSM-IV-TR, 2000). However, upon the release of the DSM-5 in May 2013, practitioners no longer provide a diagnosis of the four separate disorders. An ASD diagnosis currently encompasses a host of disorders, including the afore mentioned, that are characterized, in varying degrees, by the observation of a specific set of symptoms and/or behaviors.

Defined by the DSM-5, the criteria for a diagnosis of ASD must include persistent impairments in social interaction, communication, and the presentation of restricted, repetitive stereotypic behaviors, interests, and/or activities that exist from early childhood (prior to age 8) and

limit everyday functioning (APA, 2013). Medical practitioners must provide evidence of a persistent delay in all of these areas to determine a diagnosis of ASD. During the evaluation process, practitioners analyze the presence of social communication and social interaction impairments through the examination of the child's ability to display social-emotional reciprocity, understand nonverbal and verbal communicative behaviors used for social interactions, and develop and maintain developmentally appropriate relationships with others. Practitioners assess repetitive and restricted interests through documenting the presence of stereotyped or repetitive speech, motor movements, and/or use of objects; excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or atypical resistance to change; highly restricted, fixated interests that are abnormal in intensity or focus; and, hyper-or hypo-reactivity to sensory input. Patients must exhibit deficits in all of these areas of social interaction, combined with the documented presence of two out of four repetitive, restrictive, or stereotypic behaviors examined, to warrant an ASD diagnosis as defined by the DSM-5 (APA, 2013).

In the total population of people diagnosed with ASD, there is a varying degree of severity of impairment among those diagnosed. High functioning autism, though not a diagnostic label in the DSM-5, is a term that can be used to describe people who are considered on the higher end of this spectrum, as the severity of which the disorder limits or impairs everyday functioning is comparatively lessened. Additionally, these individuals are largely distinguished from other individuals with the same diagnosis based upon the presence of average or above average cognitive functioning (Macintosh & Dissanayake, 2004). Furthermore, individuals identified with higher functioning autism tend to display generally intact adaptive behaviors with the exception of social skills. Previously, individuals with high functioning autism were often diagnosed with Asperger's Disorder. After much debate, Asperger's Disorder is currently not a separate diagno-

sis in the DSM-5, and many of these individuals are now identified and meet criteria for an ASD diagnosis (APA, 2013). For the purpose of this investigation, high functioning autism and Asperger's Disorder are to be considered no different in regards to current diagnostic criteria established by the DSM-5, as there is no current evidence to suggest any relative differences in the populations (Macintosh & Dissanayake, 2006). Additionally, the term "autism spectrum disorder" (ASD) will be used throughout this paper to refer to the subset of individuals who previously met the diagnostic criteria of autistic disorder, Asperger's Disorder, childhood disintegrative disorder, or PDD-NOS.

Although behavioral characteristics of people with ASD are generally agreed upon in the empirical literature, and diagnostic criteria are established to identify people with ASD, until recently, the underlying biological mechanisms were unknown. Researchers in the medical field are currently investigating genetic similarities and possible environmental causal factors which is the biological mechanism that has the most empirical support (Tick, Bolton, Happe, Rutter, & Rijsdijk, in press).

Despite promising results indicating a strong genetic component determining ASD, the largest body of research to date lies in educational treatment (Simpson, 2005). Early intervention for children with ASD is critical for future educational success (CDC, 2012; Maley, 2003), and behaviorally based teaching strategies have been demonstrated to be the most effective (Maley, 2003). Consequently, parents with young children with ASD are seeking autism-specific treatments addressing the core deficits of ASD within early intervention and early childhood special education programs nationwide (Kasari et al., 2005). As more children are diagnosed with ASD, it becomes crucial to understand what treatments are most effective in helping to improve the core symptoms children display.

Social Competence and ASD

One of the hallmark deficits of students with ASD is a qualitative impairment in social interaction (Laushey & Heflin, 2000; Rao et al., 2008). Social impairments hinder all aspects of development and can potentially lead to a variety of detrimental short-term and long-term outcomes, including peer rejection, social isolation, and depression (Bellini, Peters, Benner, & Hopf, 2007). Common distinguishing traits of students with ASD are a lack of shared enjoyment or joint attention; difficulty with perspective taking; problems building, initiating, and maintaining social interactions; and the lack or inappropriate use of nonverbal body language. Other impairments such as underdeveloped social play; restricted interests; repetitive, stereotypic behaviors; and impaired pragmatic communication skills may possibly limit the opportunities to establish positive and long-lasting social relationships with others.

Despite their level of functioning, a cardinal characteristic of individuals diagnosed with ASD is their pervasive struggle in relating to people socially (Fein, Pennington, Markowitz, Braverman, & Waterhouse, 1986; Gutstein & Whitney, 2002; Weiss & Harris, 2001). This deficit in social relatedness could debatably be the most incapacitating and persistent of all the diagnostic concerns (Eaves & Ho, 2008; Howlin, Goode, Hutton, & Rutter, 2004; Njardvik, Matson, & Cherry, 1999; Rogers, 2000; Sigman et al., 1999). Qualitative differences in social interactions for people with ASD encompass nonverbal and verbal forms of communication, as well as differences in the ways they process and interpret social situations. For example, individuals with ASD often display difficulty with nonverbal forms of communication and are observed having eye contact that may be fleeting or excessive (Gutstein & Whitney, 2002). Joint attention skills such as following another's eye gaze to identify intention, establishing reference through shared eye gaze, and generating gestures to express interest may be underdeveloped for individu-

als with ASD (Gutstein & Whitney, 2002; Weiss & Harris, 2001). Emotional coordination skills, such as the demonstration of emotions and reciprocal smiling, also may be limited (Gutstein & Whitney, 2002). Additionally, Weiss and Harris (2001) found that individuals with ASD may also lack the ability to interpret nonverbal social cues, such as the ability to recognize and interpret facial expressions of others.

In conjunction with nonverbal communication skill deficits, individuals with ASD display insufficient expressive social communication abilities. Modulating and maintaining a conversation to include topic maintenance and conversational repair skills may be impaired (Gutstein & Whitney, 2002). Pragmatic language difficulties may cause individuals to struggle with identifying how and when to initiate and/or terminate a conversation. Such difficulties are often expressed through perseveration, with individuals with ASD focusing solely on preferred topics of interest. Expressing ideas or discontinuing a topic of discussion when the listener is confused or disinterested, the comprehension of conventional humor, conveying empathy, and perspective taking skills, all can pose a noteworthy struggle for individuals with ASD (Weiss & Harris, 2001). Gutstein and Whitney (2002) emphasized that the key discrepancy in people with ASD is the inability to share experiences with others, which is essentially the building block of establishing and refining human relationships. Some people with ASD may extend social initiations to others and have the capacity to build satisfying reciprocal relationships with peers, adults, and family members, albeit these attempts occur with less frequency and appear to have less significance than their neurotypical peers (Gutstein & Whitney, 2002). Although communication is one aspect of social interaction, social competence may be limited even with more complex vocal interactions (Attwood, 2000).

Gresham and Elliott (1987) defined social competence as an individual's ability to successfully utilize a learned social skill while simultaneously regulating their own behavior and emotions. The overarching deficit in social competence displayed by individuals diagnosed with ASD is pervasive and shapes the quality of their engagement with the social world in which they live. For students with high functioning autism, who possess more complex language and cognitive functioning, this deficit in the development of social competence is commonly characterized by the inability to interpret nonverbal and verbal behaviors that regulate social interactions (Barry et al., 2003), failure to build developmentally-appropriate peer relationships (Cotugno, 2009), a lack of social or emotional reciprocity and perspective taking (Attwood, 2000), difficulty with social pragmatics (White, Keonig, & Scahill, 2007), and adjusting their own verbal and nonverbal behaviors according to social cues (Ozonoff & Miller, 1995).

Theoretical Background

Although much current research in the medical field aims to find the cause of ASD, no clear evidence supports any one source of origin. However, when observing the diagnostic characteristics of individuals with ASD, the evidence is clear that individuals with ASD have a qualitative difference in the area of social competence (APA, 2013; Laushey & Heflin, 2000). In an effort to explain these unique deficits in social competence experienced by individuals with ASD, three prominent theories have emerged in the field. Executive functioning theory (EF; Ozonoff, Pennington, & Rogers, 1991), Theory of Mind (ToM; Baron-Cohen, Leslie, & Frith, 1985), and the theory of weak central coherence (WCC; Frith, 1989) attempt to explain the neurobehavioral characteristics observed in individuals with ASD. Happe, Ronald, and Plomin (2006) advocated that this triad of cognitive theories most adequately explains the broad scope of social deficits that individuals with ASD exhibit. Pellicano (2010) investigated this multifaceted

approach and found that individuals with ASD do in fact experience great variability in their cognitive processes and validated the importance of investigating all three theoretical approaches to gain holistic understanding of the cognitive profile of this population.

The EF theory of ASD hypothesizes that executive skills are significantly deficient in those with ASD when compared to those of the neurotypical individual. Specifically, the cognitive processes that can negatively affect an individual's ability to display appropriate social skills include an individual's ability to shift attention, sustain attention to task, employ self-control and self-monitoring of behaviors, regulate emotionality, plan and organize thoughts, and utilize working memory (Gioia, Isquith, Guy, & Kenworthy, 2000). Many individuals with ASD exhibit behaviors such as elopement, restricted interests, and underdeveloped self-regulation that can be explained by inadequate executive functioning.

Baron-Cohen et al. (1985) addressed the facet of social knowledge pertaining to the understanding that others have beliefs, thoughts, intentions, and feelings that are separate from one's own by investigating the individual's ToM. Individuals with ASD often present with deficient behaviors that control their ability to differentiate their own thoughts and feelings from those of others, infer others' thoughts and feelings, and predict others' behaviors (Solomon et al., 2004). Consequently, these individuals have significant difficulty in relating to others in a way that fosters the development and maintenance of reciprocal social relationships. The ToM perspective is an important component in understanding the social profile of these individuals.

Frith (1989) developed the theory of WCC of ASD in order to investigate several of the common characteristics presented by individuals with ASD. Central coherence is defined as the integration of pieces of information into a whole concept. Individuals with ASD have the ability to process the discrete parts of information, yet struggle to integrate informational details into an

inclusive concept. For example, individuals with ASD may display an insistence of sameness and routine, difficulty categorizing, and difficulty generalizing information across environments or audiences. Thus, individuals with ASD are said to have a weak central coherence

Executive functioning, Theory of Mind, and weak central coherence theoretical approaches each address different social discrepancies of individuals with ASD. Because every individual with ASD exhibits differing degrees of social competence, a theoretical shift to encompass all three theoretical perspectives can provide researchers and practitioners with a comprehensive understanding of the symptoms. Furthermore, when designing interventions to remediate the social competence of individuals with ASD, program developers must take all theoretical perspectives into consideration to adequately address and improve the overarching goal of social competence.

Social Interventions and ASD

It is important to identify interventions for individuals with ASD that may lead to measurable gains in social competence. Without effective long-term intervention that begins in early childhood, social avoidance may arise that could potentially further compound social problems (Bauminger, 2002; Krantz, 2000; White, Keonig, & Scahill, 2007). Children with ASD who have not received socially-specific interventions are increasingly the target of bullying and social rejection from their peers (Bellini et al, 2007), and experience loneliness (Bauminger & Kasari, 2000), and academic underachievement (White et al., 2007). As adolescence and adulthood approach, these outcomes become even more complicated because of the increased complexity of social interactions, self awareness of social incompetence, escalated desire for social relationships, and continued immature ToM that occurs during these later stages of development (Bal et al., 2013; Tse et al., 2007).

Although ASD can be a debilitating long-term disability, consistently targeted interventions provided in early stages of development can improve the prognosis for this population, especially for those individuals with high functioning autism. Carefully-designed targeted interventions that address the core deficits of ASD have the capability to assist in improving performance in deficit areas and reducing aberrant behaviors, which in turn may provide more educational and social options for individuals with ASD (Luiselli, McCarty, Coniglio, Zorilla-Ramirez, & Putnam, 2005). In recent years, much attention has been given to educational interventions that aim to remediate the social competence for this population. Although there are a variety of intervention methods, the literature is clear that it is crucial for children with ASD to be provided early systematic interventions for socialization during the years of early childhood development (Cappadocia & Weiss, 2010; Krantz, 2000).

Regardless of the social skills program implemented with students with ASD, it is imperative that the target population's cognitive needs are adequately addressed, as they may differ from the needs of those children with other disorders that impact social skills. Rao, Beidel, and Murray (2008) reviewed 10 social skill training programs utilized with children and adolescents with ASD age 18 or younger. The researchers found that 70% of the programs reviewed demonstrated a positive treatment effect, improving the targeted social skill. One of the critical components of the programs deemed effective was the use of modeling and repeated practice of the appropriate targeted behaviors. Additionally, a number of the programs evaluated included the use of typically developing peers to assist in providing appropriate models and assist in facilitating the intervention. In conclusion, the authors suggested that due to the targeted population's poor cognitive flexibility and failure to generalize skills across multiple settings and/or peers, future

social skill programs must provide opportunities for participants to practice the targeted skills in novel settings with unfamiliar peers to foster generalization.

Michelle Garcia Winner, founder of the Center for Social Thinking in San Jose, California, has found success in teaching social skills to children and adolescents with ASD through instruction designed to target factors previously described by Gresham (Crooke, Hendrix, & Rachman, 2008; Winner, 2008). Her intervention, which is gaining popularity in elementary and middle school applied settings, is titled *Think Social!* (Winner, 2007). Winner developed this social competence curriculum utilizing a social-cognitive framework and evidence-based practices to address older elementary and adolescent students' with ASD social competence by promoting the development of skills on how to think about others, perspective taking in a variety of situations, and engaging in self-regulatory behaviors in social situations (Winner, 2007). Winner coined the phrase Social Thinking to refer to the underlying social cognitive knowledge required for the expression of related social skills. Social Thinking is grounded in the theories of EF, ToM, and WCC discussed previously, and promotes teaching the rationale and purpose for engaging in social interactions. Winner explains that social skills instruction should concentrate not only on each discrete social skill and its generalization across environments, but also on developing the individual's ability to engage in social problem-solving and decision-making that involves dynamic cognitive processing.

Crooke and colleagues (2008) examined the effectiveness of using this Social Thinking curriculum to address the social competence of six elementary-aged students with ASD. Within each lesson, students were taught why the information on the targeted social skills is important or useful, as well as how they can use the information. Results from this study suggest that when students are taught specific social skills, in conjunction with the rationale for demonstrating these

skills within a social-cognitive framework, the students exhibit more socially acceptable behaviors across settings.

An additional intervention that shows potential to assist students with ASD in advancing their social competence is the teaching interaction procedure (TI; Leaf et al., 2009). TI, like the Social Thinking curriculum, describes the targeted behavior, provides a rationale for the use of the behavior, provides cues of what social situations are appropriate for its use, and then demonstrates the behavior for the students. The rationale is provided to encourage the student to engage in self-instruction and self-management of the social skill when in socialization situations outside of the presence of the teacher (Leaf, Dotson, Oppenheim, & Sheldon, 2010).

As suggested in the literature, it is crucial that individuals with ASD receive interventions targeting social-cognitive deficits from an early age and consistently throughout their lifetime (Krantz, 2000). In an effort to provide an early intervention Social Thinking curriculum to young children with ASD, Hendrix, Palmer, Tarshis, and Winner (2013) developed the program titled "*The Incredible Flexible You*" (*TIFY*). The program is a multi-sensory social-emotional learning package that utilizes Winner's Social Thinking concepts. The authors designed *TIFY* to engage students with ASD during the early childhood years in learning about how to improve their social-emotional problem-solving and self-regulation skills. The treatment package aims to provide early childhood educators with a curriculum that will improve the ability of young children with ASD to learn within a group, improve their social awareness, and improve their self-regulation (Hendrix, Palmer, Tarshis, & Winner, 2013). The authors utilized the social-cognitive framework in conjunction with the evidence-based practices of group discussions (MacKay et al., 2007), visually presented information (Fullerton & Coyne, 1999), social stories (Broderick et al., 2002), role play opportunities (Tse et al., 2007), rehearsal opportunities (Minihan et al.,

2011), and instructional music (Hillier et al., 2012) to design this program for children from 4-7 years of age.

At this time, there is no published evidence that teaching Social Thinking concepts and strategies through *TIFY* program (Hendrix et al., 2013) impacts the social competence and related social behaviors of early childhood students with ASD. Within school settings, *No Child Left Behind* (U.S. Department of Education, 2001) legally mandates the use of evidence-based or empirically supported practices. Behavioral and social/emotional programs and interventions are included in this mandate. However, despite the increased prevalence of the use of social skills training programs, minimal research has fully established the majority of these packaged programs as evidence-based. The What Works Clearinghouse defines evidence-based practices as interventions that have a significant scientific research base supporting their effectiveness (2004). Teachers are often hesitant about which programs to select for teaching social competence to students with ASD, as the presence of evidence-based practices is limited. Extensive future research needs to investigate the effectiveness of various programs.

Individuals with ASD experience social difficulties across their lifespan that in turn impact their daily functioning. Practitioners in the field of special education are utilizing social skills training with this population as a major component of their instruction. Therefore, materials for facilitating social skills instruction are becoming increasingly more popular and commercially available. Unfortunately, there is little research base to validate the use of the programs. Consequently, it is crucial to investigate what interventions are most effective in the remediation of social skills deficits. School settings are naturalistic environments with unlimited opportunities for children to engage in social interactions with both peers and adults. Such an applied setting is the ideal environment to explore the effectiveness of these programs. At this time, there is

no published evidence that teaching Social Thinking concepts and strategies through the program *The Incredible Flexible You* (Hendrix et al., 2013) impacts the social competence and related social behaviors of young students with ASD.

The purpose of the current study is to provide an initial investigation into the effectiveness of a comprehensive social skills training intervention, *The Incredible Flexible You* (Hendrix et al., 2013), on the social competence of young children with ASD. The social skills curriculum consists of empirically validated techniques that have been shown effective with students with ASD, such as group discussion, social stories, visually presented information, role play, opportunities for rehearsal, and instructional music.

Research Questions

Research question one. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social initiations of participants during recess?

Research question two. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social responses of participants during recess?

Research question three. How does the implementation of *The Incredible Flexible You* curriculum affect the active engagement of participants during recess?

Research question four. How does the implementation of *The Incredible Flexible You* curriculum affect the overall social functioning of participants?

2 REVIEW OF THE LITERATURE

Autism spectrum disorder is being diagnosed by pediatricians throughout the U.S. at the alarming rate of 1 in 68 children (CDC, 2012). Additionally, the U.S. Department of Education, National Center for Education Statistics (2013) reported that the number of school-age children diagnosed with autism who are receiving any of the continuum of special education placement options rose drastically from approximately 94,000 in 2000-2001 to 417,000 in 2010-2011. This reflects a startling increase of over 450% in ten years. This spectrum of disorders occurs in all racial subgroups and across all socioeconomic backgrounds. Historically data show a significantly higher instance of diagnoses in boys rather than girls (CDC, 2012).

One of the hallmark deficits of students with ASD is a qualitative impairment in the area of socialization (Laushey & Heflin, 2000; Rao et al., 2008). Social impairments hinder all aspects of development and can potentially lead to a variety of detrimental short-term and long-term outcomes, including peer rejection, social isolation, and depression (Bellini, Peters, Benner, & Hopf, 2007). Common distinguishing traits of these students are a lack of shared enjoyment or joint attention; difficulty with perspective taking; problems building, initiating and maintaining social interactions; and, the lack of or inappropriate use of nonverbal body language. Other impairments such as underdeveloped social play; restricted interests; repetitive, stereotypic behaviors; and, impaired pragmatic communication skills may possibly limit the opportunities to establish positive and long-lasting social relationships with others. These significant deficits in social skills make interacting with peers more difficult for individuals with ASD (Bellini et al., 2007).

Regardless of their level of functioning, a common characteristic of individuals diagnosed with ASD is their pervasive struggle in relating to people socially (Fein, Pennington, Markowitz, Braverman, & Waterhouse, 1986; Gutstein & Whitney, 2002; Weiss & Harris, 2001).

This deficit in social relatedness could debatably be the most incapacitating and persistent of all the diagnostic concerns (Eaves & Ho, 2008; Howlin, Goode, Hutton, & Rutter, 2004; Njardvik, Matson, & Cherry, 1999; Rogers, 2000; Sigman et al., 1999). Qualitative differences in social interactions for people with ASD encompass nonverbal and verbal forms of communication, as well as differences in the ways they process and interpret social situations. For example, individuals with ASD often display difficulty with nonverbal forms of communication and are observed having eye contact that may be either fleeting or excessive. Joint attention skills such as following another's eye gaze to identify intention, establishing reference through shared eye gaze, and generating gestures to express interest may be underdeveloped for individuals with ASD (Gutstein & Whitney, 2002; Weiss & Harris, 2001). Emotional coordination skills, such as the demonstration of emotions and reciprocal smiling, also may be limited (Gutstein & Whitney, 2002). Additionally, Weiss and Harris (2001) found that individuals with ASD may lack the ability to interpret nonverbal social clues, such as the ability to recognize and interpret facial expressions of others.

By definition, individuals identified with ASD exhibit concurrent deficits in socialization, receptive and/or expressive language, and the presentation of restricted interests and repetitive behaviors (APA, 2013). These behavioral deficits are further complicated by documented insufficiency in perspective taking, executive functioning, and the development of central coherence (Baron-Cohen et al, 1985; Frith, 1998; Landa & Goldberg, 2005). Consequently, these students are often targeted for specialized instruction through speech/language therapy, social skills interventions, supplementary aids and services, and placement within special education programs within the public school environment (Winner, 2008). The U.S. Department of Education reported that 37% of students in the public school system serviced under the IDEA classification of

"autism" participate in the general education classroom for more than eighty percent of their school day (U.S. Department of Education, 2013). As a result, therein lies a critical need for daily targeted interventions to address the core deficits displayed by individuals with ASD, beginning in early childhood, in order to assist these individuals in assimilating with their neurotypical peers (Maley, 2003).

Without effective long-term intervention that begins in early childhood for children with ASD, social avoidance behaviors may arise that could potentially further compound their social problems (Bauminger, 2002; Krantz, 2000; White, Keonig, & Scahill, 2007). Children with ASD who have not received socially-specific interventions are increasingly the target of bullying and social rejection from their peers (Bellini et al., 2007), and experience loneliness (Bauminger & Kasari, 2000), and academic underachievement (White et al., 2007). Furthermore, as adolescence and adulthood approach, these outcomes become even more complicated due to the increased complexity of social interactions, self awareness of social incompetence, escalated desire for social relationships, and continued immature theory of mind that occurs during these later stages of development (Bal et al., 2013; Tse et al., 2007).

This chapter will present an overview of the research literature for using cognitive-behavioral based social skills interventions to improve the social competence of young children with ASD. Initially, theoretical foundations of ASD will be extensively reviewed, including executive functioning, Theory of Mind, and weak central coherence. Secondly, a detailed review of social interventions utilized currently within the applied school setting for the general population and for children with disabilities will be provided. Social interventions designed for implementation with students with ASD will be detailed and a thorough review of social interventions specific to young children with ASD will be presented. This includes a description of the curric-

ulum by Hendrix et al. (2013) titled *The Incredible Flexible You*. A summary and overview of the purpose of the current research study is also included.

Theoretical Foundations

Previous researchers have utilized interventions rooted in behaviorism and the principles of applied behavior analysis (ABA) to address the deficits in social competence of students with ASD (Lovaas, 1987; Matson, Matson, & Rivet, 2007). However, because they do not teach children the underlying thoughts and perceptions related to the targeted social behaviors, ABA methods have been criticized for a lack of generalization across environments (Winner, 2007). While ABA techniques can be considered effective interventions for modifying behavior with children with ASD, significant shortcomings of utilizing ABA to teach social skills include the exclusion of teaching students how to understand when, where, and why demonstrating appropriate behavior is deemed necessary. Additionally, ABA techniques do not address how certain behaviors can affect other people. Individuals with ASD on the higher functioning end of the spectrum do not exhibit discernible difficulties with expressive language, intelligence, or adaptive behavior, as their primary deficits lie in the areas of pragmatic language and socialization (Rao, Beidel, & Murray, 2008; Winner, 2007). Nevertheless, these students exhibit significant difficulty in the ability to utilize language appropriately within social exchanges, which are complicated further by their patterns of restrictive interests. Consequently, when discussing the social competence of students with ASD, especially those who are higher functioning, there has been a paradigm shift within the ASD research literature towards understanding social cognition (Bellini et al., 2007).

Social cognition is the complex process whereby individuals acquire, understand, use, and generalize social knowledge to accurately respond to verbal and nonverbal social infor-

mation (Crooke, Hendrix, & Rachman, 2007). Early research in determining the underlying cognitive domains that function as a cause of the significant social deficits in individuals with ASD was inconclusive in identifying one root cause. This spurred investigation into executive functioning deficits (Ozonoff, Pennington, & Rogers, 1991), Theory of Mind (Baron-Cohen, Leslie, & Frith, 1985), and weak central coherence (Frith, 1989). Over time, cognitive theorists agreed that no single theory adequately explained the broad scope of the social deficits that individuals with ASD experience. Consequently, Happé, Ronald, and Plomin (2006) advocated that cognitive researchers abandon the attempt to find one primary explanation for ASD and investigate explanations encompassing coexisting differences in executive functioning (EF), Theory of Mind (ToM), and weak central coherence (WCC). They proposed that the cognitive level, as at the behavioral symptom level, could be characterized by fractional impairments and that the combination of three independent cognitive differences gives a more complete understanding of the cognitive profile of individuals with ASD. Happé et al. (2006), and Pellicano (2010) investigated this multifaceted approach to understanding the cognitive profile of individuals with ASD. The researchers found that this population does in fact show combined deficits in EF, ToM, and WCC that persist over time, despite great variability within each individual's profile.

Executive Functioning and ASD. Executive functions refer to the numerous cognitive processes that act as signals to engage the brain to perform or execute a self-regulated and goal-directed task (McCloskey, Perkins, & VanDivner, 2009). Behaviors that rely upon executive capacities include an individual's ability to shift attention, sustain attention to task, initiate tasks, employ self-control, regulate emotionality, plan and organize thoughts, and utilize working memory (Gioia, Isquith, Guy, & Kenworthy, 2000). Furthermore, executive functions signal and direct the engagement of one's reasoning abilities to assist individuals in engaging in purposeful

responses to intrapersonal, interpersonal, and environmental situations (Gioia et al., 2000; Welsh, Pennington, & Grossier, 1991). Current literature suggests that executive dysfunction may be a contributing factor to communication and social impairments in children with ASD (Landa & Goldberg, 2005; Lopez, Lincoln, Ozonoff, & Lai, 2005; Solomon, Goodlin-Jones, & Anders, 2004).

The executive function theory of ASD hypothesizes that executive skills are significantly deficient in those with ASD when compared with those of the neurotypical individual. Winner (2008) explained that in order for individuals to display appropriate social skills, they must be able to deter inappropriate responses, regulate their emotional responses, cognitively shift between topics of conversation, display flexibility in their thinking, and self-monitor. If individuals have deficiencies in any or all of these executive function skill areas, there is great potential that their ability to have meaningful relationships with their peers will be in jeopardy, even if they have acquired some discrete social skills. Executive dysfunction has been identified in individuals with ASD regardless of the severity of the disorder, specifically in the areas of planning and cognitive flexibility (Landa & Goldberg, 2005; Verte et al., 2006). However, these individuals do show executive function strengths in the areas of working memory and responses to rote tasks (Lopez et al., 2005). The majority of the activities and experiences that people encounter on a daily basis rely heavily on planning and cognitive flexibility. Individuals with ASD who demonstrate differences in executive dysfunction will likely experience a number of challenges in daily life that their neurotypical peers will not.

One of the core deficits of ASD is identified as the engagement in repetitive stereotypic behaviors and restricted interests. Combined with the profile described above of executive strengths and weaknesses, the possibility of these deficits contributing to the restricted interests

and stereotypic behaviors exhibited by those with ASDs is significant (Lopez et al., 2005). Stereotypical behaviors and cognitive inflexibility often create a social roadblock for children with ASD, because their tendencies to display repetitive behaviors and perseverate upon their interests are perceived by others as atypical. Engagement in these behaviors can in turn be the impetus for social isolation and bullying of these individuals by their neurotypical peers (Bauminger & Kasari, 2000).

Another of the core deficits of ASD is communication deficits. Landa and Goldberg (2005) studied the relationship between the linguistic components affected by autism and executive functioning and found that when individuals communicate a meaningful or novel phrase, planning is a necessary component for success. Many children with ASD speak in rote, memorized phrases, and may even use them in appropriate contexts. However, they also may be observed having one-sided conversations without the forethought of others trying to engage them in a discussion (Barry et al., 2003). The ability to utilize self-control and refrain from providing inappropriate responses or discussions of restricted interest is a significant challenge for those affected with ASD (Sze & Wood, 2007). Forming novel responses, employing verbal reasoning, and demonstrating social pragmatics are often lacking within this population (White et al., 2007). Additionally, in order to engage in successful social interactions requiring the use of language, individuals must be able to have cognitive flexibility to shift between concepts and word meanings, and to understand figurative language (Landa & Goldberg, 2005). Individuals with ASD often lack the ability to execute these cognitive functions, which in turn hinders their ability to initiate and maintain reciprocal conversations with others. Executive dysfunction also may be a contributing cause to these qualitative differences in pragmatic language.

Lastly, another notable aspect of executive functioning that relates to successful social functioning is emotional regulation. Emotional regulation refers to a person's ability to initiate, maintain, and modulate one's current emotional state or mood. This includes the ability to control the intensity, duration, and behavioral manifestation of that mood (Eisenberg et al., 1997). Emotional regulation is a critical aspect of social functioning, as those who can shift and focus their attention appropriately and modulate their behavioral reaction to rising emotions are able to react in an appropriate manner to social situations and cope with negative emotions. Laurent and Rubin (2004) explained a range of developmental milestones that neurotypical children reach when developing self-regulation encompass skills such as controlling impulsive reactions to social situations and using metacognitive strategies to plan and self-monitor emotional responses. Individuals with ASD can often be observed exhibiting behaviors that suggest minimal ability to engage in self-regulation. Elopement, perseveration on topics of restricted interests, and overreaction to sensory or social input are just a few of the commonly reported behaviors in which these individuals engage that may be caused by executive dysfunction (Eisenberg et al., 1997). Intensive early interventions to assist in building these cognitive differences are key to assisting individuals with ASD in successfully engaging in the social world.

Theory of Mind and ASD. In addition to the research suggesting that individuals with ASD have deficits in executive functioning, additional literature discusses the Theory of Mind perspective. Theory of Mind (ToM) addresses the facet of social knowledge pertaining to the understanding that others have beliefs, thoughts, intentions, and feelings that are separate from one's own. Baron-Cohen, Leslie, and Frith (1985) defined a typically developing person's ability to effortlessly and instantaneously engage in socially competent behaviors as Theory of Mind. Because effective social interactions rely on a person's successful perspective taking and re-

sponses to the understanding of others within the context of the interaction, deficits in ToM theoretically explain the significant difficulties that individuals with ASD generally experience throughout their lifetime (Baron-Cohen, 1989; Gevers et al., 2006). Behaviors that control an individual's ability to differentiate his or her own thoughts and feelings from those of others, infer others' thoughts and feelings, and predict others' behaviors are lacking in individuals with ASD (Baron-Cohen et al., 1985; Pellicano, 2007; Solomon et al., 2004). These behaviors associated with ToM undergo a surge in development during the preschool years for neurotypical children (Pellicano, 2007).

Overlap exists between the behaviors that compose ToM and behaviors that compose executive functions, because tasks that involve ToM have an executive component that requires the individual to focus, perceive, modulate, and regulate accordingly (Pellicano, 2007). Ozonoff, Pennington, and Rogers (1991) studied the ToM and executive function abilities in children with ASD as compared with a control group of neurotypical individuals. The researchers found deficits in the areas of executive function, ToM, emotion perception, and verbal memory in the individuals with ASD, as compared with the control group.

In a seminal study conducted by Baron-Cohen and colleagues (1985), the authors suggested that the difficulty that individuals with ASD experience in understanding another's belief was unique to the population, and was determined separate from other cognitive abilities, given that the same deficit was not seen in individuals with intellectual disabilities. Further findings of the same study demonstrated a significant relationship between ToM and social skill deficits experienced by individuals with ASD. Therefore, the ToM perspective is an important component in understanding social differences in individuals with ASD. This theoretical approach assists practitioners in identifying specific targets for intervention that aim to improve the individual's

ability to understand how one's own behaviors can affect others, as well as understand humor and figurative language.

Weak Central Coherence and ASD. In an effort to find a plausible explanation of several common characteristics of individuals with ASD that are not addressed by ToM, Frith (1989) developed the weak central coherence theory of autism. Central coherence is defined as the integration of pieces of information into a whole concept, essentially, an individual's automatic, rapid interpretation of information into the "big picture", instead of focusing solely on the individual parts of information (Happé & Frith, 2007). Children with ASD demonstrate a weak central coherence due to their tendency to over focus on the individual pieces of information rather than the "global" context (Morgan, Maybery, & Durkin, 2003). Studies have shown that children with ASD are advantaged by tasks that require processing of the individual details, yet are disadvantaged by tasks that require more holistic processing (Happé, 1997; Jolliffe & Baron-Cohen, 2000). A weak central coherence can further complicate the documented socialization difficulties of individuals with ASD because these individuals may have significant distress when small changes occur within their environments. When utilizing their local processing, these individuals focus on the minute details of a situation, leading to an insistence of sameness. Such maladaptive behaviors may limit individuals with ASD from deriving meaning from events in their everyday lives. Additionally, weak central coherence may have a negative impact on the individual's ability to generalize information from one context to another. This theory of social development in autism has assisted in understanding how information processing can account for some of the common characteristics of insistence of sameness and routine, difficulty with generalization of concepts, and the heightened anxiety individuals affected by ASD encounter (Happe & Frith, 2006).

Summary

Early cognitive research in ASD was conducted primarily with the purpose of testing three major cognitive theories of ASD in an effort to identify the one underlying cognitive domain that defined the spectrum of disorders. Executive function (EF) deficits help explain difficulties in planning, flexibility, and complex problem-solving experienced by individuals with ASD (Ozonoff et al., 1991). Deficits in Theory of Mind (ToM) explain the difficulties that individuals experience understanding emotions and taking the perspective of others (Baron-Cohen et al., 1985). Weak central coherence (WCC) accounts for the tendency of individuals with ASD to excel at evaluating informational details, but to have great difficulty integrating information into a larger context (Frith, 1989). Over time, cognitive theorists came to the agreement that no single theory explained the complex social profile of individuals with ASD adequately. Consequently, Happé, Ronald, and Plomin (2006) urged cognitive researchers to abandon the attempt to find one primary explanation for the social deficits of the population and focus their investigations on explanations and remediating interventions for these coexisting differences in EF, ToM, and WCC.

Social Interventions

Sheridan and Walker (1999) defined social skills as explicit, observable, and measurable behaviors that result in positive social interactions. Gresham (1986) argued that the social skill impairments experienced by children with ASD are a probable result of one of three factors: (1) a skill deficit, meaning that the child has not acquired the skill; (2) a self-control skill deficit, meaning that the student is experiencing situational factors that prevent social skill acquisition, or (3) a performance deficit, which refers to the idea that the student has learned a variety of skill sets, but does not know when or how to use them in a functional way. Based on what is known

about ASD, it appears that a combination of these proposed contributing factors of inadequate social functioning are present. Therefore, when developing interventions for socialization, each factor should be targeted for specialized intervention. Without explicit instructional intervention, impaired social functioning in students with ASD can trigger social isolation, poor school performance, and academic underachievement (Bauminger & Schulman, 2003; Rogers, 2000). Practitioners are developing interventions for these social deficits in a multitude of different methods, from training specific social skills with specific individuals to social-cognition based interventions instructed in group settings within the school environment.

A multitude of socials skills intervention packages and curricula for children with ASD exist on the market today, available for purchase to practitioners in a variety of contexts. Whereas many of these packaged programs were derived from a research base, many were not. Due to NCLB legislation in 2001, school-based programs for socialization are required to be embedded with evidence-based practices. As the availability of social skills programs continues to grow, it is essential that these interventions be derived from empirical standards and vigorously tested through research.

Due to the lack of connectivity between research and practice, the importance of establishing evidence-based practices has been on the forefront of educational practice (Odom et al., 2005). In 2003, the Council for Exceptional Children's (CEC) Division of Research responded to the charge of the NCLB mandate on the use of evidence-based practices by teachers in all classrooms. A team of professionals was charged to develop quality indicators to determine the effectiveness of special education practices (Odom et al., 2005). The field of special education continues to struggle to generate specific criteria for the types and levels of evidence required to call a practice evidence based (Odom et al., 2005).

Specific to ASD, in 2015, the National Autism Center (NAC) published an updated report that outlined which educational and behavioral treatments have been shown effective for children with ASD based upon the strength of evidence available. The aim of the report was to assist parents and professionals in recognizing and selecting evidence-based practices. The NAC used operationalized inclusion and exclusion criteria and surveyed the autism literature published between 1957 and 2012. They further utilized a rating scale to evaluate each study's scientific merit and categorized treatments as being well-established, emerging, not-established, or ineffective based upon a thorough investigation of research design, measurement of independent and dependent variables, inclusion criteria, and generalization potential (NAC, 2015). The results of this thorough investigation by the NAC established treatments as evidence-based practices when they were supported by numerous peer-reviewed research articles.

The call for the use of evidence-based practices in the field of special education continues to be of significant concern (Simpson, 2005). With the implementation of Response to Intervention (RTI) within the school settings, effective social interventions were identified by the U.S. Department of Education to address the general population of students, as well as students with disabilities. However, with the increased prevalence of students with ASD in our schools, the NAC has also provided a collection of evidence-based practices to address the social competence of this population. The following sections will provide a thorough review of the literature of social interventions designed to address the needs of all students, students with ASD, as well as young students with ASD.

Social Interventions for All Students

Social and emotional development has deep-seated implications in teaching and learning within today's schools. Teachers must address not only the academic components of

each child, but the social and emotional components as well (Zins, Weissberg, Wang, & Walberg, 2004). In today's classroom, students typically learn independently, but also in collaboration with their teachers, in cooperative groupings with their peers, and with the encouragement and support of their families. Researchers warn that social-emotional development can facilitate or impede children's academic engagement, work ethic, and ultimately the success of the outcome of their school experiences (Elias et al., 1997). Because of the reciprocal relationship between social and emotional development and academic success, schools and families must work collaboratively to effectively address these components of the educational environments to benefit all students. A line of developmental research exists that extensively investigates the correlation between the mastery of social-emotional competencies and academic achievement (Eisenberg, 2006; Guerra & Bradshaw, 2008; Masten & Coatsworth, 1998; Weissberg & Greenberg, 1998). Consequently, it has been hypothesized that a universally designed school-based effort to promote the social and emotional growth of all students is a promising approach to improving student outcomes (Elias et al., 1997). Additionally, interventions that follow a cognitive behavioral therapy model, often utilized by counselors within the school environment, to improve the social functioning of students through a solution-based framework are gaining more recognition in the literature (Bauminger, 2002).

Positive behavioral intervention supports. In an effort to address the social-emotional development of children within the school environment, Lewis and Sugai (1999) developed the school-wide positive behavioral intervention supports (PBIS) strategy. PBIS is a universal prevention strategy that aims to alter the school environment by developing systematic procedures that promote positive student behaviors. These systems are data driven and integrate input from all stakeholders (e.g., students, teachers, administrators, families) involved in the educational en-

vironment. Rooted in behaviorism and social learning theory principles, PBIS applies these organizational behavioral strategies to the entire student body consistently across all facets of the school (Horner, Albin, Sprague, & Todd, 1999). PBIS aims to circumvent disruptive student behaviors through creating a three-tiered organizational level of support for students. Students in classrooms with weak classroom and behavioral management receive less academic instruction, which in-turn spawns negative academic, social, and behavioral outcomes, than do students who participate in classrooms with systematic, consistent social and behavioral systems in place (National Research Council, 2002; Weinstein, 2007). Schools that employ the school-wide PBIS model provide the organizational systems to address the behavioral and social development of their students and increase instructional time, while addressing the social-emotional component of teaching and learning in the 21st century school climate (Sugai, Horner, & Gresham, 2002).

Cognitive behavioral therapy. Cognitive behavioral therapy (CBT) interventions provide a psycho-educational approach that is comprised of both cognitive and behavioral techniques. Cognitively, students learn how to navigate the social environment through instruction on how to interpret social cues, such as facial expressions and body language (Mennuti et al., 2006). The focus lies on improving the students' ability to organize and monitor their own thoughts, understand cause and effect relationships, problem solve, and understand emotional and social situations (Anderson & Morris, 2006; Bauminger, 2002; Solomon et al., 2004). Behaviorally, students improve social functioning through scaffolded instruction, multiple opportunities to respond, constructive feedback on their performance, and good models of appropriate social interactions. These components of the CBT framework lend themselves to being a good fit for teaching social skills, social problem solving, and social thinking (Bauminger, 2002; Sze & Wood, 2007; Winner, 2005).

Literature has established the efficacy of the use of cognitive behavior therapy (CBT) to address a variety of learning and social skill deficits exhibited by neurotypical students and students with ASD (Anderson & Morris, 2006; Christner, Forrest, Morley, & Weinstein, 2007; Mennuti, Freeman, & Christner, 2006; Smallwood, Christner, & Brill, 2007). CBT also has become an effective and commonly utilized model for providing services to students in a school-based setting, and it addresses the demand for evidence-based practices (Association for Behavioral and Cognitive Therapies, 2010). An advantage of CBT is that it focuses on problem-solving in structured, brief sessions. The solution-based framework tends to be easily implemented within a school-based delivery model (Anderson & Morris, 2006; Christner, Mennuti, & Person, 2009).

As a result of the positive effects of CBT techniques, this approach is gaining attention in the literature as having potential to improve the social functioning of students with ASD, as well as the general population (Attwood, 2000; Bauminger, 2002; Ingram, 2006; Livanis, Solomon, & Ingram, 2007; Sze & Wood, 2007). Ingram (2006) noted that the CBT approach may be most effective for individuals who are considered high functioning on the autism spectrum, as they possess the ability to learn through verbal presentation, have developed verbal skills, and have a desire to engage in social situations. Additionally, the author suggested that when working with students with ASD, emphasis should be placed on behavioral components due to the student's deficits in executive functioning, theory of mind, and weak central coherence. Because their deficits lie in both cognitive and behavioral areas of development, students with ASD require an approach to social skill development that is both cognitive and behavioral to be successful in building social competence. These deficits affect these students in their ability to understand social situations, communicate effectively verbally and nonverbally, and interpret others' behaviors

within the social context. Additionally, the deficits manifest themselves in an inability to take the perspective of others or interpret situations outside of the literal sense (Ingram, 2006).

Social Interventions for ASD

Social stories (Gray & Garand, 1993), video modeling (Apple, Billingsley, & Schwartz, 2005), teaching interactions procedure (Dotson & Leaf, 2010), and social thinking (Winner, 2008) are several effective social skill interventions that are commonly utilized in applied settings with students with ASD. Some research evidence exists which suggests that many of these interventions result in positive gains in targeted social skills; however, reviews indicate varying levels of improvement (Reichow & Volkmar, 2010; White et al., 2007). The following sections of this paper examine the research and describe these interventions, recognized by the NAC (2015) as well-established or emerging social interventions for students with ASD.

Social Stories. An intervention commonly utilized with children with ASD to promote social skills is the use of Social Stories (Gray, 2000). Carol Gray developed Social Stories in an effort to utilize individualized stories to teach children with ASD how to respond in certain social situations that may be challenging or intimidating. Teachers, parents, and other service providers facilitate the usage of the social story to foster the learning of discrete, situational, socialization skills. Each story provides the individual with a script to follow that describes the event, possible challenges, and how to appropriately respond to the given social situation, in efforts to reduce inappropriate behaviors or reactions to life events. Additionally, the Social Story provides an avenue for specialized instruction. For example, Social Stories may address skills required to initiate a conversation with a peer, to take turns, or even to respond behaviorally at the dentist's office.

Gray (2000) outlined specific essential components to include when developing a social story for a student with ASD. The Social Story must introduce the social situation; instruct the individual on the specific behaviors that are expected within the situation; and give an explanation of the possible reactions other people may have based on the behaviors in which the child engages. Although the content must contain these key components, Gray explains that it is essential to begin the story with a descriptive sentence that introduces the topic in a factual and logical manner. Additionally, due to students with ASD having difficulty with ToM and a weak central coherence, Social Stories should incorporate perspective sentences that relay the thoughts and emotions of others and how to most appropriately act or verbally respond. Gray guides practitioners to develop Social Stories with a formulaic combination of directives, descriptive, perspective, and/or affirmative types of statements.

When used to promote social engagement, teach discrete social skills, or develop self-management, research has shown that Social Stories are an effective intervention for students with ASD (Delano & Snell, 2006). Furthermore, when presented in a combined format with multimedia, Social Stories have been found to be effective in improving students' functional behaviors (Hagiwara & Myles, 1999). Kokina and Kern (2010) conducted a meta-analysis of single-case design studies examining the use of Social Stories with students with ASD. Although Social Stories showed reasonable results on behavior change in students with ASD, there were common factors that increased the effectiveness of the intervention. Those factors included focusing on the reduction of inappropriate behaviors (Kuoch & Mirenda, 2003); describing a single targeted behavior (Demiri, 2004); developing content of the Social Story based upon data derived from a Functional Behavioral Assessment (Crozier & Tincani, 2007); and implementing the intervention in a general education setting (Delano & Snell, 2006). Social Stories are com-

monly utilized by educators throughout the country and are recognized by the National Autism Research Council (2009) as an evidence-based practice for students with ASD. Continued research should be conducted to broaden the evidence base, however teachers reported high social validity regarding the utilization of Social Stories (Kokina & Kern, 2010).

Video modeling. Another promising intervention for facilitating the social development of students with ASD is video modeling. Video modeling utilizes videos that demonstrate targeted behaviors with peers, adults, and the student with ASD serving as the model (Bellini, Akullian, & Hopf, 2007). This approach to social and behavioral intervention allows students with ASD the opportunity to view the appropriate responses to social situations through video evidence of how to appropriately execute social responses. The goal of video modeling is that after the individual with ASD views the video, he or she will be able to successfully imitate the appropriate targeted behavior. Teachers and practitioners reported high social validity when utilizing video modeling with children with ASD as a social intervention (Charlop-Christy, Le, & Freeman, 2000).

When combined with additional practice, prompts, and role playing, video modeling has been shown to be effective in teaching social behaviors. Research has shown video modeling to be an effective intervention for children with ASD for teaching and promoting conversational speech (Charlop & Milstein, 1989), perspective taking (LeBlanc et al., 2003), pretend play (MacDonald, Clark, Garrigan, & Vangala, 2005), complex play sequences (D'Ateno, Mangiapanello, & Taylor, 2003), social initiations (Nikopoulos & Keenan, 2003, 2004), spontaneous requesting (Wert & Neisworth, 2003), appropriate responding (Buggey, Toombs, Gardener, & Cervetti, 1999), and social engagement (Bellini et al., 2007). However, the need for future research is critical to determine if using the "self-as-model" is more effective than using the "other-as-model". Sherer et al. (2001) hypothesized that because previous research showed similar results, utilizing both methods for different skill sets may be the most effective. The authors

proposed that the "self-as-model" format should be utilized for addressing aberrant behaviors or performance deficits; whereas, the "other-as-model" format should be utilized for acquisition deficits. However, although further research is required to tease out the efficacy of the two formats, the research is clear that video modeling capitalizes on the strength of visual processing experienced by individuals with ASD (Buggey et al., 1999).

Teaching interactions procedure. The teaching interactions procedure (TI) is based upon the principles of ABA. TI is a systematic teaching procedure during which the teacher describes the behavior, provides a rationale for the use of the behavior, provides cues of what social situations are appropriate for its use, and then demonstrates the behavior for the students. The learners' roles within TI are to role play the behavior being taught and adjust performance based upon feedback from the teacher. Whereas TI is very similar to behavioral skills training, it differs in that it provides a rationale for the behavior. This rationale is provided to encourage the student to engage in self-instruction and self-management of the social skill when in socialization situations outside of the presence of the teacher (Leaf, Dotson, Oppenheim, & Sheldon, 2010). Minkin et al. (1976) initially implemented TI with four adolescent girls who presented with deficient socialization skills, and found that all participants showed an increase in conversational skills. Maloney et al. (1976) replicated their study that same year and reported similar findings. TI has since been utilized to teach safety skills to young children (Yeaton & Bailey, 1978), and to facilitate staff training (Harchik, Sherman, Sheldon, & Strouse, 1992).

In 2009, Leaf et al. were the first researchers to implement TI, in combination with a systematic token economy reinforcement system, to teach social skills to students with ASD. Although TI had been utilized with other populations, the study was the first to investigate its effects with students with ASD. Four prosocial behaviors were taught to each of the three partici-

pants in a one-to-one setting, and all the participants showed an increase in all trained social skill behaviors. The study expanded the research base through demonstrating that the use of the TI procedure is effective for teaching social skills to students with ASD.

Leaf et al. (2010) expanded their research by implementing the TI procedure to improve the social skills behaviors of five students with ASD in a group clinical setting. They sought to determine if the TI procedure was as effective in a group setting for this population, as it was within a one-to-one setting. Whereas children with ASD have noted deficits in observational learning necessary for learning within a group instruction environment (Varni, Lovaas, Koegel, & Everett, 1979), Leaf et al. evaluated the effectiveness and possible advantages of teaching participants with ASD within a group setting. All five elementary-aged participants showed marked improvement from baseline in the performance of the social skills targeted. The study extended the research through the implementation of TI in group social skills instruction, as well as evaluating the sustainability effect of the outcomes for each participant.

Dotson, Leaf, Sheldon, and Sherman (2010) replicated the earlier Leaf et al. (2010) study with five adolescents with ASD in an afterschool, private program in a university setting, two days per week. The results of this study were consistent with the previous research and found marked increases in the prosocial behaviors targeted for the participants. Group instruction increased the chance of observational learning of the participants and allowed them to see multiple exemplars of the same social skill. These studies demonstrated the possibility that group instruction of social skills utilizing TI is a promising avenue for teaching social skills to students with ASD.

Social Thinking. In 2008, Crooke and colleagues conducted an initial investigation of the implementation of the packaged program *Social Thinking* by Michelle Garcia Winner with

students with ASD. They targeted social cognition to assist these students in understanding the reasoning behind engaging in specific social behaviors. In the study, the authors documented pre and post frequency counts of the participant's "expected" (prosocial) and "unexpected" (inappropriate) verbal and nonverbal behaviors to determine the impact of the intervention. The researchers reported marked increases in the ability of individuals with ASD to use positive social skills, as well as an increase in the understanding of the rationale of the underlying social skills. Results from the study suggest that when students are taught how and why to engage in social interactions, rather than being given discrete skill social training, more natural behaviors are observed within the group setting.

Winner's *Social Thinking* (2008) curriculum for adolescents with ASD utilizes all of the components of Cognitive Behavioral Therapy discussed earlier under strategies for typical students, thus promoting teaching the "why" behind socialization, without implicitly targeting discrete social skills. The authors found that providing the rationale component of practice increased relevancy of the behaviors to assist students with ASD in gaining social understanding and building social competence. Social Thinking addresses the essential components of social interventions (Krasney et al., 2003), while teaching the underlying social cognitive knowledge required for successful social interactions (Winner, 2000). Furthermore, the *Social Thinking* paradigm addresses the well-documented deficits in executive functioning exhibited by individuals with ASD (Ozonoff et al., 1991).

Rooted in some well-established evidence-based practices, it is important to note that this intervention, although based on a manualized curriculum from Winner (2002) is not an approach that addresses discrete skill sets. The curriculum is designed to promote the core principles of social competence (e.g., steps of communication, steps of perspective-taking, etc.) through activ-

ities designed in the vein of CBT. In addition, strategies taught within the curriculum related to flexible thinking and self-monitoring are based on literature that supports ToM and executive dysfunction theory of ASD. Specifically, these strategies aim to improve deficits in cognitive inflexibility and difficulties with emotional self-regulation, and to help children make the connection of the relationship with their level of social competence and others' perceptions. Consequently, the author suggested that interventions for addressing social difficulties should not target solely the teaching of discrete social skills, but should target teaching both self-regulation and self-monitoring behaviors in efforts to improve the individual's social competency and in turn, social acceptability. While the pilot data conducted by Crooke et al. (2008) is encouraging and constitutes an acceptable foundational level of evidence within the field of communication disorders (ASHA, 2004), no controlled study examining such an approach has been reported in the literature. Currently, the Crooke et al. (2008) study is part of a larger research project examining the effectiveness and generalization effects of *Social Thinking* in children diagnosed with ASD.

Social Interventions for Young Children with ASD

Maley (2003) reported the critical need for young children with ASD to receive daily targeted intervention to address the core socialization deficits often experienced by the population. Although many of the previously described interventions can assist in developing the social competence of students with ASD from childhood to adolescence, research has shown evidence that early intensive behavioral intervention (Lovaas, 1987), pivotal response training (Koegel, Koegel, & Carter, 1999), and peer-mediated interventions (Odom et al., 2003) have an effect on the development of social competence of young students with ASD. Additionally, a new pro-

gram titled *The Incredible Flexible You* (Hendrix et al., 2013) will be reviewed. The lines of research for these intensive social interventions for young children with ASD are outlined below.

Early intensive behavioral intervention. In 1987, Ivor Lovaas conducted a seminal study on the effects of intensive behavioral training on the development of young children with ASD. The research findings demonstrated that if children received intensive behavioral intervention for the majority of their waking hours for several years, some young children will catch up to their typically developing peers. Although these results have never been replicated, this intensive intervention, now titled early intensive behavioral intervention, is considered a well established intervention for young children with ASD. Early intensive behavioral intervention (EIBI) was developed from the principles of applied behavior analysis (ABA) for the purpose of intensively implementing procedures to comprehensively address all areas of developmental needs of young children with ASD. Based upon the behavioral assumption that every act that people engage in is considered behavior, EIBI attempts to change behaviors through altering the antecedents and consequences of those behaviors, a core principle of ABA (Cooper, Heron, & Heward, 2007).

Generally, EIBI is initiated with young children with ASD in early childhood (18 months to 4 years of age) and is implemented intensely within the home and school setting (e.g., approximately 40 hours per week) (Lord & McGee, 2001). Early EIBI programs utilized a discrete trial training (DTT) teaching format. DTT is a highly structured approach to behavior change and skill acquisition. In DTT, skills are task analyzed into minute, observable, and measurable steps and taught in a one-on-one setting. Multiple opportunities to respond are an advantage for DTT, as the individual with ASD engages in repeated, fast-paced trials until mastery of the targeted skill is attained (Sarokoff & Sturmey, 2004). The teacher or practitioner utilizes specific dis-

criminative stimulus prompts to elicit a behavioral response from the individual with ASD, then provides consequent reinforcement following correct responses. DTT also utilizes shaping and discrimination training behavioral techniques (Marcus et al., 2001). A potential limitation of DTT is that skills learned within this contrived teaching format may not readily generalize to the natural environment.

Pivotal Response Training. Pivotal Response Training (PRT: Koegel, Koegel, & Carter, 1999; Rogers, 2008) is a promising intervention that shows potential to assist students with ASD in advancing their social competency. Developed within the theory of behaviorism (Cooper, Heron, & Heward, 2007), and in response to the early work of Applied Behavior Analysis (Lovaas, 1987), PRT is defined as behaviors that are central to wide areas of functioning such that a change in the pivotal behavior will produce improvements across a number of behaviors (Koegel, Koegel, & Carter, 1999). There are eight key characteristics of PRT including the following: motivation, task variation, natural reinforcers, reinforce all attempts, respond to multiple cues, self-initiated learning interactions, self-management, and teaching under natural conditions where the behavior ordinarily occurs. Thus, the technique of PRT can fit well into inclusive settings in which children with ASD are placed as it uses their peers to mediate the intervention when targeting social skill deficits.

Prior research using PRT primarily focused on children with ASD in elementary school, ranging from ages seven to ten years. Pierce and Schreibman (1995) conducted a series of studies using peer implemented PRT to enhance social competency in younger children with autism. Initiations for both play and conversations increased, as well as language quality and frequency, and duration of utterances for the participants (Pierce & Schreibman, 1995; Pierce & Schreibman, 1997). Additionally, skills generalized to novel toys and at lower levels to untrained peers

(Pierce & Schreibman, 1995). However, when multiple peers were systematically introduced using a multiple-baseline design, skills were generalized to untrained peers (Pierce & Schreibman, 1997). Joint attention, which was not directly targeted by the intervention, also increased as a result of the intervention. These findings were substantiated and extended by Kuhn et al. (2008) who implemented peer-mediated PRT using peers within a self-contained special education elementary class to interact with children with ASD. Similar results in social interaction increases were observed. These results provide preliminary evidence that peers with disabilities which are less severe than ASD can implement PRT with fidelity to affect change in the social skills of their peers with ASD (Kuhn et al., 2008).

Peer mediated. Researchers have expanded the PRT work using peer-mediated interventions with students with ASD. Odom et al. (2003) completed an extensive review of the literature looking for evidenced-based practices in young children with autism. Specifically, the authors examined research studies with a single-case methodology for children ages five and under. This analysis resulted in 11 categories of studies, which included peer-mediated interventions and adult directed interventions. Using the criteria set by Lonigan et al. (1998) as well as newly established criteria by the current authors, the lines of research were divided into one of three categories: *well established* (having more than nine studies to support the practice), *emerging and effective* (having at least six single-subject design studies), and *probably efficacious* (at least three studies supporting the practice) (Odom et al., 2003). Peer-mediated interventions were ranked emerging and effective, while adult-directed teaching was determined to be well-established.

Rogers (2000) provided a comprehensive review of the research on different intervention strategies for facilitating social interactions in elementary children with ASD and noted the shift

from adult-directed to peer-mediated strategies. Several studies implementing PRT and similar techniques have documented that using peers as implementers of social skills facilitation for children with ASD has shown an increase in the social initiations and responses for both the trained peers and their partners with ASD (Kuhn et al., 2008; Owen-DeSchryver et al., 2008; Pierce & Schreibman, 1995, 1997). These studies also incorporated the use of adults to facilitate the peer interactions within both self-contained and integrated early intervention and early elementary classrooms, noting that at this developmental level, peers may need the assistance of an adult to provide visual or verbal prompts.

A line of reasoning for the use of inclusive programs for educating students with ASD is that these individuals will benefit from the exposure to and interactions with neurotypical peers (Laushey & Heflin, 2000). Regrettably, research suggests that in inclusive settings, adult prompting is an essential component as typical peers and peers with autism do not always interact independently (Gresham, 1984). Psotka (1995) posited that an immersion approach of learning is only successful if the students with ASD are able to observe, interpret, and imitate the behaviors of their peers. Solely immersing students with ASD into a general education environment amongst their neurotypical peers does not provide the adequate structure and support necessary for improved social competence. Because of deficits in weak central coherence described earlier, students with ASD may fail to observe the relevant features of social exchanges or imitate socially appropriate behaviors, and may make inaccurate interpretations of their environment (Attwood, 1998). Laushey and Heflin (2000) found that specific training combined with a supportive structure resulted in higher percentages of age-appropriate social interactions between students with ASD and their neurotypical peers.

Historically, adults were the primary mediators of providing social skills instruction to children with ASD (Odom et al., 2003). However, critics from the field of special education posed the concern that this approach may be fostering prompt dependency and lack of skill generalization in students with ASD (Weiss & Harris, 2001). Additionally, very often individuals with ASD are disliked or experience social isolation due to their typically developing peers viewing their restricted interests and repetitive behaviors as strange or atypical. Researchers urged that both adults and peers can serve as agents in the implementation of social skill interventions for children with ASD. Odom and Strain (1984) initially investigated the concept of using peer-mediated strategies with children with ASD. Their findings resulted in the description of the following three types of social interaction techniques peers could employ: proximity (i.e., grouping typically developing peers with those with ASD without formally training the procedures), prompt and reinforce (i.e., teaching the typically developing peers to probe and reinforce certain behaviors displayed by the student with ASD), and peer initiation training (i.e., discretely instructing the typically developing peers on how to make and maintain social initiations with the children with ASD). Peer-mediated approaches to social instruction assist in increasing the network of friends for children with ASD, while providing them with naturalistic opportunities to learn and practice the targeted social skills (Aspy & Grossman, 2007). Overall, instructional models that incorporate typically developing peers provide students with ASD with structure and predictability, while increasing their acceptance with their peer group. Although more research needs to be conducted, both adult and peer mediated methods appear to have moderate success with children with ASD (Weiss & Harris, 2001).

The Incredible Flexible You. In 2013, *The Incredible Flexible You* (*TIFY*) curriculum was designed by Hendrix et al. as a multi-sensory, social-emotional learning package for young

children with ASD who can learn through language. Rooted in Winner's *Social Thinking* (2008) framework, *TIFY* teaches children with ASD about their thoughts and feelings, being part of a group both physically and cognitively, perspective thinking, social-emotional problem solving, and monitoring their own self-regulation. The treatment package aims to provide teachers with a curriculum that will improve the ability of young children with ASD to learn within a group environment and improve their social awareness and self-regulation (Hendrix et al., 2013). The authors utilized a cognitive behavioral framework in conjunction with evidence-based practices (NAC, 20) of group discussions (MacKay et al., 2007), visually presented information (Fullerton & Coyne, 1999), social stories (Broderick et al., 2002; Gray, 2000), role play opportunities (Tse et al., 2007), rehearsal opportunities (Minihan et al., 2011), and instructional music (Hillier et al., 2012) to design this program for children from 4-7 years of age in an effort to improve the social competency of young children with ASD. Although the cognitive-behavioral packaged program has yet to be investigated for its own efficacy due to its recent development, it is expected that due to the program's components being rooted in well-established, evidence-based practices that the program itself may be effective in improving the social competence of the targeted population.

Summary

With the rise in identification of students with ASD, school systems nationwide are searching to find an approach to social skills training for this population that is both effective and cost efficient. One-to-one teaching is highly costly to implement within the school-based setting (Chasson, Harris, & Neely, 2007). In times of economic turmoil, group interventions are often the route educators must take to address the needs of their students in a cost effective manner. However, without the appropriate systematic intensive instruction backed by empirical research,

schools are struggling to provide appropriate social skills instruction for their students with ASD. While the previously discussed social skills treatments have been found to be effective for teaching social skills to children with ASD, many have only been studied within the clinical setting. Conducting research in the applied school setting can provide invaluable information regarding social competency training for students with ASD.

Students with ASD display socialization deficits from a very young age that can extend into adulthood without specifically designed instruction. With the increase in the diagnoses of ASD, new programs to address the core social deficits are being published with very little empirical evidence to support their usage. WWC (2010) outlined the criterion required to establish a practice as "evidence-based", and NCLB (2001) mandated the usage of evidence-based practices in all areas of instruction for all students, including students with ASD. In 2013, Hendrix et al. developed *The Incredible Flexible You* curriculum to systematically address the development of social competence in young children with ASD. Whereas this packaged curriculum is rooted in a cognitive behavior approach and evidence-based practices for students with ASD, no research studies have been conducted to determine the efficacy of the packaged program itself. Therefore, the current study aimed to add to the literature base and provide an initial evaluation of this curriculum for young children with ASD.

3 METHODOLOGY

It is crucial that individuals with ASD receive interventions targeting social-cognitive deficits from an early age and consistently throughout their lifetime (Krantz, 2000). In an effort to provide such intervention, Hendrix, Palmer, Tarshis, and Winner (2013) developed the program titled "*The Incredible Flexible You*". The program is a multi-sensory social-emotional learning package that utilizes Winner's Social Thinking concepts to engage students with ASD to learn about and improve their social-emotional, problem-solving, and self-regulation skills. The authors utilized the social-cognitive framework in conjunction with the evidence and empirically-based practices of group discussions (MacKay et al., 2007), visually presented information (Fullerton & Coyne, 1999), social stories (Broderick et al., 2002), role play opportunities (Tse et al., 2007), rehearsal opportunities (Minihan et al., 2011), and instructional music (Hillier et al., 2012) to design this program for children from 4–7 years of age. Although rooted in research-based teaching practices, there is a lack of empirical evidence that teaching Social Thinking concepts and strategies through the program *The Incredible Flexible You* (Hendrix et al., 2013) impacts the social competence and related social behaviors of young students with ASD. Although the program has yet to be investigated as a packaged intervention, it is expected that the program's components will be effective in improving the social competence of the targeted population.

The purpose of the current study was to provide an initial investigation into the effectiveness of a comprehensive social skills training intervention, *The Incredible Flexible You: A Social Thinking Curriculum for Preschool and Early Elementary Years* (*TIFY*; Hendrix et al., 2013), on the social competence of young children with ASD. Eight students with ASD between the ages of 5 and 7 years, with current placement in kindergarten or first grade self-contained classrooms

for children with ASD in a public school setting, participated in a 12-week intervention implementing the *TIFY* program. The intervention occurred daily for approximately 20 minutes in a small group arrangement within the typical classroom setting. Utilizing a concurrent multiple baseline across participants single-case research design (Kazdin, 2011), the research study aimed to evaluate the effectiveness of the program upon the participant's social engagement and social initiations during generalized recess sessions.

Research Questions

Research question one. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social initiations of participants during recess?

Research question two. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social responses of participants during recess?

Research question three. How does the implementation of *The Incredible Flexible You* curriculum affect the appropriate active engagement of participants during recess?

Research question four. How does the implementation of *The Incredible Flexible You* curriculum affect the overall social functioning of participants?

Participants

This research study targeted young children (ages 5–7) who have been diagnosed with ASD, as defined by the characteristics outlined in the DSM-5 (APA, 2013). A diagnosis of ASD is broadly defined as the presence of qualitative impairments in socialization development and communication development, and the presence of restricted repetitive and stereotyped patterns of behavior, interests, and activities. The population targeted historically displays pervasive deficits in socialization characterized by atypical social skill development (Laushey & Heflin, 2000). Criteria for being included in this study were as follows: (1) chronological age between 4 and 7

years 6 months old as of August 1, 2015; (2) DSM diagnosis of Autism Spectrum Disorder or an educational diagnosis of significant developmental delayed with documented delays in the areas of social/emotional development or special education classification of autism as defined by IDEA; (3) low total social functioning scores documented by the Autism Social Skills Profile (Bellini, 2006; Bellini & Hopf, 2007) subscores of the Social Reciprocity, Detrimental Social Behaviors, and Participation/Avoidance behavior strands; (4) an Individualized Education Plan with an educational placement within a kindergarten or first grade self-contained classroom for students with ASD within a suburban county in the Southeastern U.S.; and, (5) full scale and verbal comprehension IQ score of 80 or above (since the targeted participants had to have the ability to participate verbally in a social skills group). The first 8 participants who met eligibility criteria and returned parental permission were included in the study. The research team aimed to have a minimum of six eligible participants for the single-case research study, with a maximum of 8 participants. Clinical diagnoses and educational classifications were confirmed through a thorough review of prior evaluations and educational reports. All participants met study criteria for participation with a DSM-5 Autism diagnosis.

The parents of the participants were also included as participants within the current study. The parents participated in providing valuable information regarding their child's social functioning. Parent participants completed the Autism Social Skills Profile (ASSP; Bellini, 2006; Bellini & Hopf, 2007) to provide information regarding their child's overall social functioning. Parents provided this information before the baseline and after the follow-up phases of the study.

Finally, four school personnel participants including 3 paraprofessionals and 1 teacher were recruited for this research study to assist in assessing and documenting the social validity of

TIFY. School personnel were required to have had daily contact with the child participants to be eligible to participate, but were not the participants' classroom teachers. Each school personnel participant was asked to provide information relating to the social validity of the *TIFY* intervention. They were asked to complete the Behavior Intervention Rating Scale (BIRS: Elliot & Treuting, 1991), the social validity measure utilized for this research study, after the follow-up phase.

Setting

Due to the documented need for practitioners in applied, school-based settings to utilize evidence-based practices that adequately address the social competency of young students with ASD (Chasson, Harris, & Neely, 2007), this research study was conducted within the school setting. Two self-contained classrooms for students with ASD (one kindergarten/1st grade with 7 students and one first grade with 5 students) in a public elementary school within a suburban county in the Southeastern U.S were utilized. The classrooms where intervention was conducted consisted of one certified special education teacher and one paraprofessional. The school system is the seventh largest school system in the state, with an enrollment of over 42,000 students. It consists of 35 schools; 20 elementary schools, 9 middle schools, 6 high schools, one middle/high online school, and one alternative education program for middle and high school students. The 4-year graduation rate is 87%, which is above the state average of 69%. The student principal investigator conducted all *TIFY* group sessions, while the teacher and paraprofessional engaged other students in daily classroom activities.

Observations were conducted during two inclusive recess times, each of which lasted approximately 25 minutes. Observational data were collected for two dyads per recess period. Participants attended regularly scheduled recess times with their same aged neurotypical peers.

Approximately 40 children and 2 teachers were present during each recess time. The playground utilized for recess consisted of two large playground structures and two swing sets, with 8 swings. The playground is partially covered by a sunshade over one of the playground structures, and enclosed by a fence to ensure safety. The only other equipment provided to the students was a bucket of various-sized playground balls. In the recess environment, participants were consistently able to choose from the same set of interactive activities throughout the study. The participants had the opportunity to play either by themselves or with peers on various playground equipment and with playground balls. No restrictions to equipment or playground areas were implemented.

Research Design

A concurrent multiple baseline across participants single-case design was utilized (Kazdin, 2011). All of the participants were paired for the duration of the study. Participants were paired with one other participant with a similar age from the same classroom. Each dyad of students received the intervention together. The study consisted of three phases: baseline, intervention, and follow-up. Data for all three phases were collected on the targeted dependent variables performed by each participant. Baseline sessions continued until each participant had a minimum of 5 data points in baseline. After 5 baseline data points were collected, the first dyad of participants began intervention led by the student PI. After the first dyad of students concluded the first *TIFY* lesson session, the second dyad of students began intervention. Each dyad of students entered intervention after the first *TIFY* lesson sessions for the previous dyad concluded. Movement from the baseline to intervention phase was not dependent upon a behavior change from the previous dyad, yet only occurred at the conclusion of the first *TIFY* lesson sessions. The intervention phase continued until five sessions for all five *TIFY* lessons had been completed, for

a total of 25 sessions. All intervention phases for each dyad continued for a minimum of 5 data points per storybook. For each participant, a performance goal was set as at least a 25% improvement of the demonstration of the dependent variable over the baseline mean. This individual goal had to be reached on 3 out of 5 consecutive sessions. If the participant did not reach the individual goal for the skill, the student continued in intervention. Data were collected daily on the targeted behaviors in a naturalistic setting during recess amongst typical peers of the same grade level. Follow-up data were collected one week after intervention ceased on all dependent variables in all dyads for up to three data points.

Rationale for Single-Case Design

Single-case research is often utilized within the applied fields of psychology, special education, and the study of human behavior. Single-case research is experimental (Horner et al., 2005) and is often employed as an alternate to group designs in quantitative research of low incidence disabilities (Kratochwill et al., 2010; McDonnell & O'Neill, 2003), and in research where high numbers of participants are unavailable. In the current study, the number of participants within the school was small, which meets criteria to use a single-case design. Single-case research allows researchers to analyze individual growth and progress toward specific treatment goals, and may assist in establishing evidence-based practices (Horner et al., 2005). The concurrent multiple baseline across participants design was utilized within the current study. This design can assist in the demonstration of a functional relation between the independent and dependent variables (Kazdin, 2011; Kennedy, 2005). Multiple-baseline designs decrease threats to internal validity, while providing a convincing argument for the potential efficacy of an intervention (Smith et al., 2007). Kazdin (2011) stated that threats to internal validity should be considered highest priority to ensure that a demonstration of effect between the independent and de-

pendent variables is in fact the result of a causal relationship. Multiple-baseline designs address threats to internal validity through introducing the intervention at different points in time. Examining performances across different baselines demonstrates that a behavior change occurs when and only when intervention is applied, hence reducing the treats to internal validity (Kazdin, 2011). Additionally, multiple baseline designs are effective for applied research because the sequential implementation of the independent variable parallels the daily practice of many educators. Moreover, the multiple baseline design is appropriate for use with social skills as social skills are a class of behaviors that may not return to baseline levels if the intervention is removed as in other designs (e.g., reversal). Consequently, the parsimony of these designs tends to motivate teachers to evaluate their practices empirically to determine their significance (Horner et al., 2005).

The What Works Clearinghouse (WWC) has established a set of standards that practitioners are strongly encouraged to utilize when conducting and evaluating single-case research that can be considered empirically-valid within certain disciplines (Kratochwill et al., 2010). These standards were used in the current study. The first standard for any single-case research study is that the independent variable must be systematically manipulated with defined decision rules for phase changes by the researcher. Additionally, WWC requires that three demonstrations of effect occur at different points in time and by multiple observers to demonstrate experimental control. Each phase within the research design must have a minimum of five data points to qualify as a demonstration of effect. Finally, WWC suggests that single-case researchers engage in the exploration of procedural fidelity, social validity, and interobserver agreement when conducting single-case research to ensure that research is completed with integrity and is significant within its scope (Kratochwill et al, 2010).

Within applied disciplines such as special education, single-case designs are often preferred because they are highly flexible and highlight individual differences in response to intervention effects (Perone & Hursh, 2013). Each individual serves as his/her own control. Single-case research measures operationally-defined targeted behaviors over a series of periods of time. Initially during the baseline phase, the dependent variables are measured in absence of the independent variable. In subsequent phases, the independent variable is introduced and data on the targeted dependent variables continue to be recorded. Final phases may systematically remove the independent variable or introduce new dependent variables or participants to replicate findings. Single-case researchers manipulate one variable to determine if there is a causal functional relation between the independent and dependent variables. Careful visual analysis of the data collected is utilized to draw causal inferences about the impact of the intervention on the dependent variable (Kazdin, 2011; Kennedy, 2005). Kazdin (2011) pointed out that visual inspection of data utilized in single-case studies can assist researchers to clearly determine if criteria are met, as well as help influence decision making, treatment planning, and intervention evaluation.

Variables

Statement and description of independent variable. The independent variable for this study was the implementation of *The Incredible Flexible You* curriculum (Hendrix et al., 2013) in the small group setting. The program is a manualized, multi-sensory, social-emotional learning package that utilizes Winner's (2005) Social Thinking concepts. The authors designed "*The Incredible Flexible You*" (*TIFY*) to engage students with ASD during the early childhood years in learning about how to improve their social-emotional problem-solving and self-regulation skills. The manualized treatment package aims to provide early childhood educators with a curriculum

that will improve the ability of young children with ASD to learn within a group, improve their social awareness, and improve their own self-regulation (Hendrix et al., 2013). The authors utilized the social-cognitive framework in conjunction with the evidence-based practices of group discussions (MacKay et al., 2007), visually presented information (Fullerton & Coyne, 1999), social stories (Broderick et al., 2002), role play opportunities (Tse et al., 2007), rehearsal opportunities (Minihan et al., 2011), and instructional music (Hillier et al., 2012) to design this program for children from 4–7 years of age.

The authors designed *TIFY* (Hendrix et al., 2013) curriculum to include five lessons, each intended to teach a specific Social Thinking concept incorporating a different storybook. Lesson concepts and vocabulary build upon each other and each concept is infused across all the other lessons during relevant moments. Therefore, the curriculum was designed to begin at lesson one, to be subsequently followed by working through the other lessons in the outlined order within the manual. The authors provide a specific, systematic, predictable lesson layout for practitioners to follow when conducting each lesson. Each lesson has multiple components, and the authors advise that it will take at least four sessions to complete each lesson. Each lesson incorporates the following components: opening routine, storybook reading, structured activities/games, dramatic play, and a closing routine.

The materials required for implementation of *TIFY Social Thinking* curriculum include the packaged kit by Hendrix, Zweber, Tarshis, and Winner (2013). This includes the 200-page detailed lesson book, five colorful storybooks that are utilized throughout the lessons, and an instructional music CD by Tom Chapin. Each storybook follows the complex social concept adventures of the same four characters, Evan, Ellie, Jesse, and Molly. Readers' journey along with the characters as their adventures unfold in various settings that mirror children's real-life and

imaginative experiences in the classroom, on a farm, underwater in the ocean, during a trip to outer space, and at the zoo. Storybooks are introduced in the lessons and students are provided multiple exposures to each storybook throughout the curriculum. These five storybooks are titled *Thinking Thoughts and Feeling Feelings*; *The Group Plan*; *Thinking with Your Eyes*; *Body in the Group*; and *Whole Body Listening* (Hendrix et al., 2013). Each storybook presents the social concepts as titled.

Verbal, visual, and auditory transactional prompts are provided throughout each lesson component. Students with ASD may learn more readily with visual support to aid in transitions, active engagement, and successful performance within the classroom environment (Buggey et al., 1999). *TIFY* lessons include visual supports and schedules of activities to guide students with ASD visually through the lesson plan. Each lesson includes small visual props provided within the curriculum that are tailored to each lesson. The lessons require basic early childhood classroom school supplies such as construction paper, crayons, puppets, or simple childhood games. Hillier et al. (2012) found that the incorporation of music within instructional lessons increases the active engagement of learners with autism. Therefore, music is incorporated in the lessons to augment each lesson and to provide an auditory component to each lesson's structured learning tasks. Finally, the dramatic play component of each lesson provides students with an opportunity for guided practice paired with continuous behavior-specific praise and corrective feedback upon the participant's performance. This component allows students to engage in interactions with their peers while the teacher models the desired behavioral responses and provides positive reinforcement based upon student response.

Statement and operational definitions of dependent variables. Although researchers cannot demonstrate external validity of their measures without the demonstration of internal va-

lidity, single-case research designs call upon researchers to make evident the ways in which the interventions are able to be generalized beyond the scope of the applied research setting. Horner et al. (2005) explained that single-case research requires systematic replication to enhance external validity. To ensure that future researchers can replicate a study, clear and concise operational definitions of the participants, settings, and inclusion/exclusion criteria are crucial. Kennedy (2005) identified direct observation of behavior as a standard characteristic of single-case research designs. Single-case research identifies dependent variables, commonly observable and measurable behaviors, as having the following features: (a) operational definition; (b) ability to be measured repeatedly; (c) recording can be assessed for consistency; and, (d) selected for social significance (Horner et al., 2005). After careful selection of the dependent variables, these targeted behaviors must be operationally-defined to include the description of the behavior observed within terms that allow the researcher to measure variables that are observable, measurable, and repeatable (Horner et al., 2005).

Throughout this study, direct observations of operationally-defined behaviors of positive social initiations, positive social responses, and appropriate active engagement were recorded and utilized as the primary source of data. Operational definitions described specific examples of the targeted behavior that were counted as an occurrence, as well as specific non-examples of the behavior that would not be counted as an occurrence. All direct observations of participants' targeted social behaviors were conducted within the participants' regularly scheduled inclusive recess periods. The operational definitions of the dependent variables were as follows:

Positive social initiations. Positive social initations were defined as the child engaging in requesting assistance or information from others; requesting interaction or participation; joining a play activity or interaction; giving a greeting or compliment; or showing, sharing, or giving an

object to a peer. Examples of positive social initiations were observed as the participant greeting a peer with a "hello, how are you?", sharing an object or a toy with a peer, or asking a peer to play with him/her. Interactions with peers that were not considered as an example of positive social initiations included a participant pulling another child to an area to play or not allowing another child to play with a shared object or toy.

Positive social responses. Positive social responses were defined as the child responding to a request for assistance or information, joining an activity when asked by a peer, accepting an object when offered, one-word responses to peer social initiations, or appropriately continuing a social interaction. Examples of positive social responses were the participant responding with visual attention when a peer is speaking to him/her, joining a childhood game after being asked by a peer, or saying "thank you" when a peer offers a toy. Nonexamples of positive social responses included the participant walking away when a peer is speaking to him/her, responding "go away" when asked to join a childhood game, or grabbing at an object that is offered to him/her.

Appropriate active engagement. Appropriate active engagement was defined as the child being observed in physical proximity of the group, looking in the direction of the speaker, responding to questions or directives posed by others, demonstrating physical self-control in group, or participating verbally or nonverbally with the group. Examples of appropriate active engagement included the participant maintaining hands and feet to self while in a group, responding with nice words to questions from a peer, and/or running and playing with peers in a group. Nonexamples of appropriate active engagement included the participant pushing or shoving a peer, responding with negative verbiage to peers when asked a question, or yelling at a peer when he/she is speaking.

Measures

Direct observation. A frequency recording within a one-minute interval data collection system was utilized to record the number of positive social initiations made by participants during recess time. Positive social responses were recorded utilizing a frequency recording of positive social responses embedded in a one-minute interval recording system and reported as a percentage of opportunities the participant engaged in a social response. Appropriate active engagement during recess time was recorded utilizing a partial interval time-sampling observational recording system based on 1-minute intervals. The student PI conducted all observations. The student PI observed the student participant for ten 1-minute consecutive intervals. Appropriate active engagement was recorded if the participant displayed the behavior at least once during any portion of the interval. Each interval was recorded as an occurrence or nonoccurrence (see Appendix B).

Data on positive social initiations, positive social responding, and appropriate active engagement occurred daily within two 20-minute recess periods. The student PI collected 10-minutes of data on all three dependent variables simultaneously for each of 4 child participants per recess period. Data were collected for one dyad of participants during the first 10-minutes of the recess period, and another dyad of participants during the second 10-minutes of the recess period. Each day the timing of the data collection alternated. For example, data were collected on the first dyad during the first 10-minutes of recess on Monday and on the second dyad during the first 10-minutes of recess on Tuesday. This alternation of data collection time ensured that a broad sample of data were collected during the recess period by one observer.

Overall social functioning. Parent participants completed the Autism Social Skills Profile (ASSP; Bellini, 2006; Bellini & Hopf, 2007) both before and after intervention. This 4-point

Likert-type scale was completed by a parent of each participant prior to the baseline phase and after the follow-up phase of the study. The ASSP assesses the participant's current level of total social functioning and is divided into three subsets of Social Reciprocity, Detrimental Social Behaviors, and Participation/Avoidance. Appendix C provides an outline of the specific questions that are scored for each subgroup (Bellini & Hopf, 2007). High scores on the assessment items indicate the participant's engagement in socially appropriate behavior, whereas lower scores indicate deficit areas. When utilized as a progress monitoring tool such as in this study, higher overall scores are the desired outcome. Evaluations of the ASSP have found high internal consistency (α =.940) and test-retest reliability was found to be .904 (Bellini & Hopf, 2007).

Interobserver Agreement

Because these data were obtained by human observers, the possibility for error is inevitable (Kennedy, 2005). Single-case designs inherently address many known threats to internal validity by way of replication or repeated measures. Internal validity occurs when the results of an experiment provide clear evidence that manipulation of the independent variable caused the changes measured in the dependent variable. In order to demonstrate that the single-case design implemented has internal validity, careful design decision rules were made and systematic or direct replication was utilized. A key component to single-case designs is the ability to demonstrate comparisons within- and between-subjects (Horner et al., 2005). Interobserver agreement (IOA) provides researchers with a systematic method to address threats to internal validity, in addition to the inherent variability that occurs when relying upon human beings to record data upon a specific behavior or set of behaviors. IOA data demonstrate the reliability of the data gathered throughout the various observational periods from baseline to follow-up. Evaluating

the consistency of data recording and ensuring that observers are measuring the same behavior through the duration of a study are key reasons for IOA (Kennedy, 2005).

In a systematic effort to circumvent or reveal the biases that an individual observer may possess, interobserver agreement data were recorded throughout this research study. The student primary investigator (PI) provided the research assistant with a comprehensive operational definition of all targeted behavioral components. Operational definitions described specific examples of the targeted behavior that were counted as an occurrence, as well as specific nonexamples of the behavior that were not to be counted as an occurrence. The student PI trained a research assistant in the data collection methods. The research assistant was trained to reliability criteria of .80 or greater on recess observations. IOA was calculated for participants on all sessions during baseline, intervention, and follow-up phases of the research study (31.4% of sessions dyad one; 32.5% dyad two; 31.1% dyad three; and, 32% dyad four). Data were recorded by the student PI and the research assistant simultaneously and independently. This interobserver agreement was collected on all dependent variables to address the reliability of data collected. IOA was calculated utilizing point-by-point agreement. The point-by-point agreement formula for calculation utilized was the number of agreements amongst the student PI and a research assistant divided by the total number of agreements plus disagreements and multiplied by 100% (Kazdin, 2011; Kennedy, 2005). IOA ranged from 85% to 97.5%.across all participants and phases of the study.

Procedural Fidelity

Horner et al. (2005) stated that in order to establish evidence-based practices through single-case design, documentation must be presented that the intervention has been conducted with fidelity. In order to ensure that procedural fidelity was addressed in the current research study, a research assistant was trained to conduct observations of the implementation of the intervention

utilizing the procedural fidelity checklist. The procedural fidelity checklist outlined the seven required instructional components that align with the *TIFY* intervention lessons (see Appendix A.). During procedural fidelity sessions, the research assistant indicated whether or not the student PI completed each of the seven required components. The information gathered was used to document the fidelity of the implementation of the *TIFY* intervention. Procedural fidelity data were collected during 25% of the *TIFY* instructional settings in all phases of the research study. The researcher then calculated procedural fidelity by dividing the number completed correctly by the total number of steps and multiplying by 100%. These calculations ranged from 85.7% to 100% fidelity for all dyads of participants across the intervention phase of the study.

Social Validity

Baer, Wolf, and Risley (1968), focused on defining the seven core dimensions of applied behavior analysis (ABA). Effectiveness of the applied intervention is one of the dimensions identified as a critical component of quality research within the field of ABA, as well as related fields. As all researchers aim to provide evidence that an intervention is effective, Baer et al. (1968) recognized that behavior changes can often be subtle and subjective to the participant or those around him/her. In other disciplines, these minute changes understandably may indicate that the intervention was ineffective. However, when conducting single-case research, effectiveness is evaluated through a measure of the changed target behavior and a measure of how the change in behavior has benefitted the consumers of that intervention. Therefore, the authors defined the effectiveness of an applied intervention as the degree to which the target behavior changed to enhance daily life for the participant. In essence, effectiveness is rooted in the degree to which the practical or social importance of the outcome has improved.

Because effectiveness is the central purpose of any applied intervention, Baer, Wolf and Risley wrote a follow-up article in 1987 in an effort to provide researchers with extended guidelines to measuring the core dimensions identified previously. Social validity was defined as the extent to which all the identified stakeholders of an intervention approved of it. Data on social validity are collected to determine if an intervention will be rejected by the participants or other stakeholders (e.g., parents, teachers). Baer et al. (1987) warned that although social validity cannot solely determine effectiveness, interventions that are shown to be socially invalid cannot possibly be effective, because of the potential for rejection (i.e., lessened implementation) by others in the environment.

The social validity of this study was measured using the Behavior Intervention Rating System (BIRS, Von Brock & Elliott, 1987). One minor revision to the wording of the original BIRS was made by adding the title of the *TIFY* intervention to each statement. The adapted BIRS (see Appendix D) consisted of 24 items rated on a 6-point Likert-type scale, with responses ranging from 1 = *I agree* to 6 = *I do not agree*. School personnel who had daily interactions with the child participants were asked to assess the social validity of the *TIFY* intervention utilizing the adapted BIRS. They rated the *TIFY* intervention across three areas including acceptability, effectiveness, and time to effect, following the intervention phase of the research study. The internal reliability for this instrument is reported as 0.97 (Carter, 2009). The average score for the school personnel participants was 3.95 with a range of means from 3.54 to 4.42. Each of the school personnel participants rated the *TIFY* curriculum's perceived treatment effectiveness to be acceptable. However, they rated the curriculum's perceived intervention effectiveness for each student to be only slightly effective.

Recruitment

Prior to the initiation of the study, a meeting was held with the school personnel including administrators, classroom teacher, and paraprofessionals of children with ASD serviced in the self-contained classrooms to review the purpose of the study, give details regarding the components of the study, explain the consent process, and answer any questions that may arise. Teachers of the classrooms were provided the inclusion and exclusion criteria for participants. A letter explaining the research study was sent home to the parents/guardians of all potential participants. Twelve students returned consent forms. As decided a priori, the first 8 students to return the signed parental permission form were accepted as participants in the study. Signed parental permission forms were obtained and kept by the PI in a locked file cabinet.

Once the child's parent signed parental consent, each also became a parent participant. Parent participants of each child with ASD completed the Autism Social Skills Profile (ASSP; Bellini & Hopf, 2007) to assess each child's preintervention level of social functioning prior to the implementation of the research study. Parents were also asked to complete the ASSP post intervention. The same parent participant was required to complete the ASSP for both pre- and post-intervention. Each completion required approximately 20 minutes.

School personnel who had daily interactions with the child participants were recruited for this study as well. Four school personnel who could provide detailed information regarding the child participants' social functioning were verbally invited to participate in the study by the student investigator. In an effort to collect a measurement of social validity, the school personnel were asked to complete the Behavior Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987) following the intervention phase of the research study. The time commitment of school personnel totaled approximately 40 minutes each. School personnel who agreed to participate in

the study signed informed consent that was obtained by the student PI and kept by the PI in a locked file cabinet.

Pilot Study

The student PI piloted the data collection sheet developed for all dependent variables measured through direct observation prior to the commencement of the current research study. Pilot data were collected utilizing these data sheets to ensure that they were user-friendly and parsimoniously gathered the required data. Data collection sheets were adjusted for the current investigation based on student PI feedback.

The student PI found that the data collection sheet for the dependent variables was in fact easy to use and understand. However, increased concern arose regarding training multiple research assistants to utilize the data collection sheet with fidelity. Originally, data were to be taken each day on all dependent variables simultaneously for all child participants for 20 minutes during one recess period which would require utilizing three to four research assistants during the recess setting. Additionally, it was discovered that all of the child participants would not be going to recess during the same recess period. Thus, it was determined that the student PI would collect 10 minutes of data for each dyad of 2 child participants per recess period. This change allowed the student PI to collect 10 minutes of data on each dependent variable simultaneously for 4 child participants each recess period. Data were collected for one dyad of participants during the first 10-minutes of the recess period, and another dyad of participants during the second 10-minutes of the recess period. Each day the timing of the data collection for each dyad alternated.

Procedures

Following the parental participant's completion of the ASSP, baseline data collection began. Data for all phases were collected on targeted dependent variables for students with ASD during the regularly scheduled recess periods. No restrictions were placed on play areas during any of the baseline observation periods. The student PI was responsible for gathering all baseline and intervention observational data collection, as well as the implementation of *TIFY* program for all intervention dyads. The student PI was a certified special education teacher with 18 years of experience with children with disabilities ages birth to 5th grade in the public school system.

The *TIFY* intervention program was provided to all participants within a small group setting for 20-minute daily sessions for five weeks, one week per storybook Groups were facilitated by the student PI, with procedural fidelity data being collected during sessions by the research assistant. The *TIFY* group occurred within the self-contained classroom setting. The purpose of the social skills group was to systematically teach the strategies outlined in *TIFY* lessons (Hendrix et al., 2013). Each small group (dyad) consisted of two participants. Four dyads were created with two participants in each dyad, based upon chronological age and same classroom placement. Each dyad began instruction at the first lesson in the *TIFY* manual and progressed through all five lessons. Each lesson required five 20-minute sessions to complete. During each group meeting, participants were engaged in structured activities designed by Hendrix et al. (2013) to teach each lesson's targeted Social Thinking concept, its underlying meaning, and to provide guided practice.

Data Analysis

Single-case researcher's primary traditional method for evaluating data is based on visual analysis (Horner et al., 2005). Visual analysis of the data collected is systematically analyzed for causation patterns between the independent and dependent variables, in addition to the determination of the presence of experimental control. This process relies heavily on the graphing of gathered data to determine causation and to make inferential decisions regarding intervention effects (Kennedy, 2005). Through strict analysis of the data, researchers are able to make judgments about whether a reliable change has occurred to the dependent variable. Changes in mean, changes in level, changes in trend, and latency of change are all contributing factors that are analyzed to ensure that the behavioral changes that are documented are in fact due to the intervention and not due to chance (Kennedy, 2005). What Works Clearinghouse (Kratochwill et al., 2010) and Kazdin (2011) discuss the specific requirements of the visual inspection process in single-case designs. These criteria were adhered to meticulously when analyzing the data gathered throughout this study. Each data point was graphed and the data were visually inspected for changes in trend, magnitude, and level within phases and across phases. Furthermore, visual analysis of the data collected drove the research decisions made and provided future researchers with directions to extend and expand this body of research.

4 RESULTS

Demographics

Results are presented for the eight child participants, ages 5 to 7, whom completed the current study. Participants were all male and most were Caucasian (62.5%). Other races/ethnicities included African American (25%) and Asian (12.5%). Children attended one of two kindergarten or first grade special education classrooms for students with ASD in a public elementary school within a suburban county servicing over 42,000 students in the Southeastern U.S.

Child Participant Characteristics

Parental permission forms were sent home by the classroom teachers to all children who met the inclusionary criteria (i.e., 12 children). All 12 children returned their forms. The first 8 to return parental permission were included in the study. The mean age of child participants was 5 years and 10 months. The majority of the participants had a school eligibility of Autism Spectrum Disorder (i.e., 62.5%). Other participants had a school eligibility of Significant Developmental Delay (i.e., 37.5%). The majority of participants also qualified for speech and language impairments (i.e., 87.5%). Table 1 shows detailed data for all 8 participants.

Table 1.

Participants' Demographic Information

Name	Age	DSM-V Diagnosis of ASD	IDEA Eligibility	Full Scale IQ
Barry	6	Yes	Autism	89
Evan	6	Yes	Autism	85
Charlie	7	Yes	Autism	85
Geoff	6	Yes	Autism	117
Everett	6	Yes	Significant Developmental Delay	80
Mike	6	Yes	Autism	80
Dan	5	Yes	Significant Developmental Delay	84
Jon	5	Yes	Significant Developmental Delay	114

Results of Research Questions

Four research questions were examined for this research study utilizing a concurrent multiple baseline across participants single-case design. The independent variable for this study was the implementation of *The Incredible Flexible You* curriculum (Hendrix et al., 2013) in the small group setting. The curriculum was implemented as designed and began at lesson one for each dyad of participants and subsequently followed by working through the other lessons outlined in the manual. Each lesson incorporates the following components: opening routine, storybook reading, structured activities/games, dramatic play, and a closing routine.

Throughout this study, direct observations of operationally-defined behaviors of positive social initiations, positive social responses, and appropriate active engagement were recorded and utilized as the primary source of data. Direct observation data were primarily analyzed through visual inspection of graphs. Visual inspection involves interpreting the trend, variability and level of the data within and across phases, as well as identifying any patterns of change in

the data (Cooper et al., 2007; Horner et al., 2005; Kazdin, 2011; Kratochwill et al., 2010). This allowed for conclusions to be drawn on whether a causal relationship exists between the *TIFY* program and the dependent variables. Additionally, all child participants were pre and post tested by their parent utilizing the Autism Social Skills Profile (ASSP; Bellini, 2006; Bellini & Hopf, 2007) to gain data regarding their overall social functioning.

Research question one. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social initiations of participants during recess?

A frequency recording within a one-minute interval data collection system was utilized to record the number of positive social initiations made by participants during recess time. The results of the implementation of *TIFY* curriculum on the frequency of positive social initiations of each participant during recess are presented in Figure 1. When data were analyzed regarding the alternation of recess time, the data did not show a change in the pattern of behavior for any of the participants. Finally, the pre- and post-intervention results of the implementation of *TIFY* curriculum on the frequency of positive social initiations of each participant during recess are presented in Figure 2. These graphs demonstrate the comparison of baseline data to follow-up data for each participant.

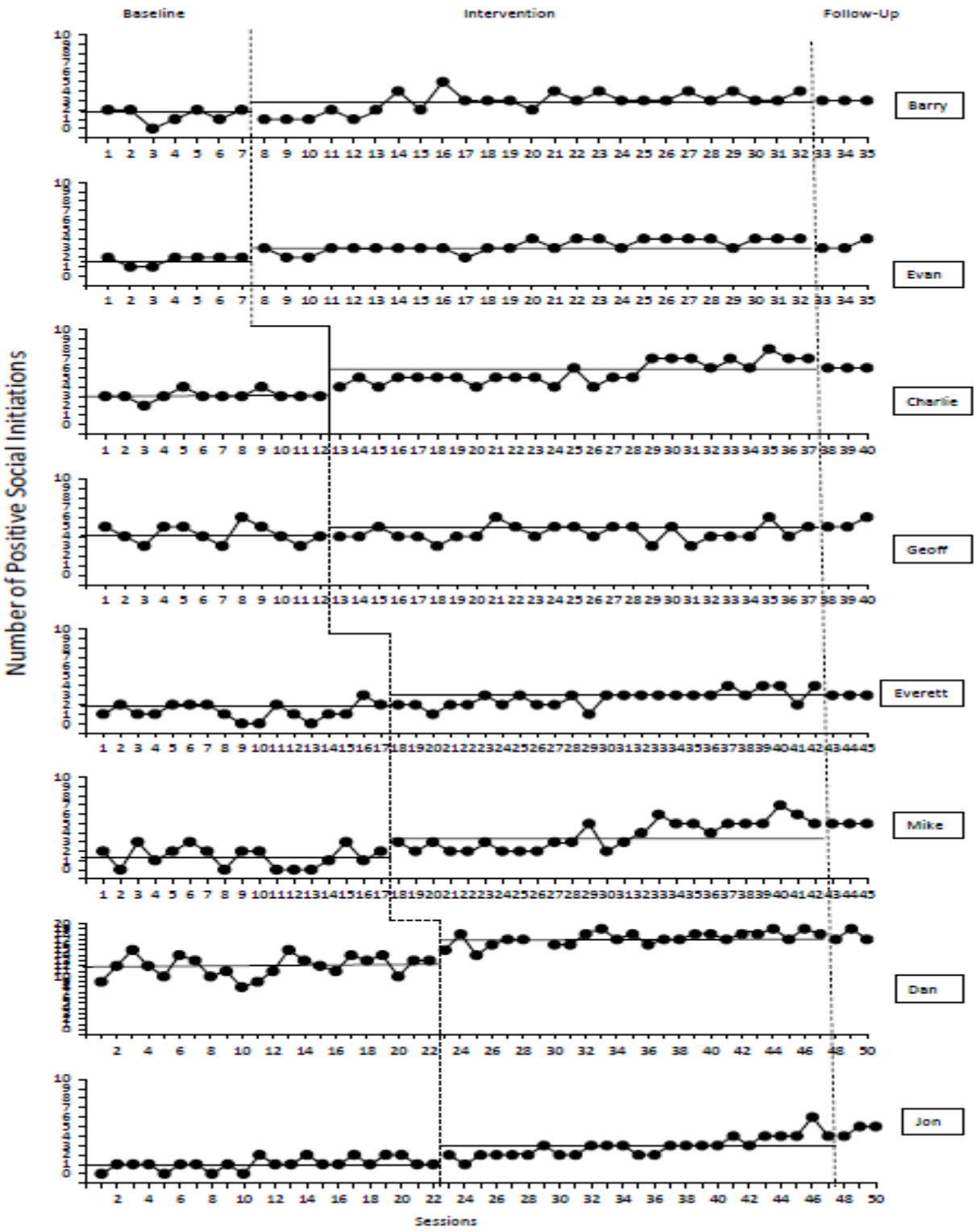

Figure 1. *Positive Social Initiations*.

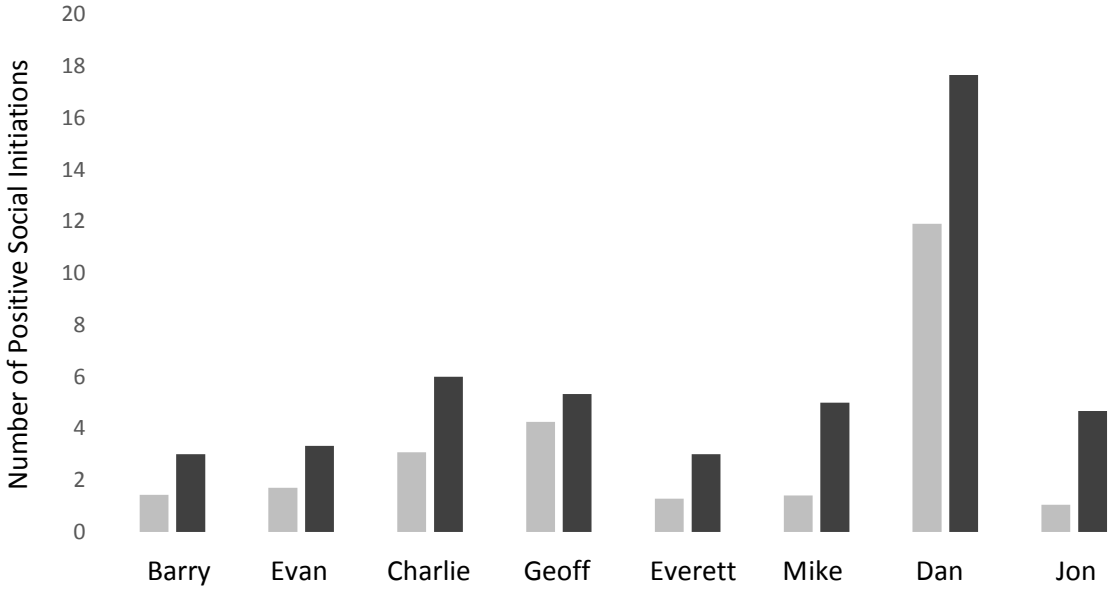

Figure 2. *Pre- and Post-intervention Positive Social Intiations.*

Barry and Evan were the first dyad of participants to begin intervention. During baseline, Barry displayed a mean of 1.4 positive social initiations (range: 0-2) in a 10-minute period during recess. His goal of 25% increase in positive social initiations during the intervention phase was 1.75 positive social initiations in a 10-minute period during recess. During the intervention phase, Barry had a mean of 2.84 positive social initiations with a range of 1 to 5 instances per recess period. Barry met his individual goal of a 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the sessions of the second storybook. Evan displayed a mean of 1.71 positive social initiations with a range of 1 to 2 during baseline. His goal of a 25% increase in positive social initiations during the intervention phase was 2.14 occurrences. During the intervention phase, Evan had a mean of 3.28 positive social initiations with a range of 2 to 4 occurrences. He met his individual goal of a 25% increase in positive social initiations during the final sessions of storybook one and the beginning sessions of storybook two. Furthermore, Barry and Evan maintained their performance levels during the follow-up phase one week after intervention ceased with 3 and 3.33 positive social initiations respectively.

The second dyad of students to receive the *TIFY* intervention was Charlie and Geoff. During baseline, Charlie engaged in a mean of 3.08 positive social initiations (range: 2-4) in a 10-minute period during recess. His goal of a 25% increase in positive social initiations during the intervention phase was 3.85 occurrences in a 10-minute recess period. During the intervention phase, Charlie had a mean of 5.52 positive social initiations with a range of 2 to 8 instances. Charlie met his individual goal of a 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the storybook one sessions. Geoff displayed a mean of 4.25 positive social initiations within the baseline phase ranging from 3 to 6 instances. His goal of a 25% increase in positive social initiations during the intervention phase was 5.31 occurrences. During the intervention phase, Geoff had a mean of 4.36 positive social initiations with a range of 3 to 6 occurrences. He met his individual goal of a 25% increase in positive social initiations during the second storybook sessions. Finally, Charlie and Geoff maintained their performance levels during the follow-up phase with 6 and 5.33 occurrences respectively.

The third dyad of students to receive the *TIFY* intervention was Everett and Mike. During baseline, Everett engaged in a mean of 1.29 positive social initiations (range: 0-3) in a 10-minute period during recess. His goal of a 25% increase in positive social initiations during the intervention phase was 1.61 occurrences in a 10-minute recess period. During the intervention phase, Everett had a mean of 2.68 positive social initiations with a range of 1 to 4 instances. Everett met his individual goal of a 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the storybook two sessions. Mike displayed a mean of 1.41 positive social initiations within the baseline phase ranging from 0 to 3 instances. His goal of a 25% increase in positive social initiations during the intervention phase was 1.76 occurrences. During the intervention phase, Mike had a mean of 3.76 positive social initiations with a range of 2 to 7 occurrences.

He met his individual goal of a 25% increase in positive social initiations during the first storybook sessions. Finally, Everett and Mike maintained their performance levels during the follow-up phase with 3 and 5 occurrences respectively.

The final dyad of students to receive the *TIFY* intervention was Dan and Jon. During baseline, Dan engaged in positive social initiations with a mean of 11.91 instances, ranging from 8 to 15 instances, in a 10-minute period during recess. His goal of a 25% increase in positive social initiations during the intervention phase was 14.89 occurrences in a 10-minute recess period. During the intervention phase, Dan had a mean of 16.52 positive social initiations with a range of 14 to 19 instances. Dan met his individual goal of a 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the storybook two sessions. On the other hand, Jon displayed a mean of 1.05 positive social initiations within the baseline phase ranging from 0 to 2 instances. His goal of a 25% increase in positive social initiations during the intervention phase was 1.31 occurrences. During the intervention phase, Jon had a mean of 2.88 positive social initiations with a range of 1 to 4 occurrences. He met his individual goal of a 25% increase in positive social initiations during the first storybook sessions. Finally, Dan and Jon maintained and exceeded their performance levels during the follow-up phase with 18 and 4 occurrences respectively.

Research question two. How does the implementation of *The Incredible Flexible You* curriculum affect the frequency of positive social responses of participants during recess?

Positive social responses were recorded utilizing a frequency recording embedded in a one-minute interval recording system and reported as a percentage of opportunities the participant engaged in a social response. The results of the implementation of *TIFY* curriculum on the frequency of positive social responses of all participants during recess are presented in Figure 3.

When data were analyzed regarding the alternation of recess time, the data did not show a change in the pattern of behavior for any of the participants. Finally, the pre- and post-intervention results of the implementation of *TIFY* curriculum on the frequency of positive social responses of each participant during recess are presented in Figure 4. These graphs demonstrate the comparison of baseline data to follow-up data for each participant.

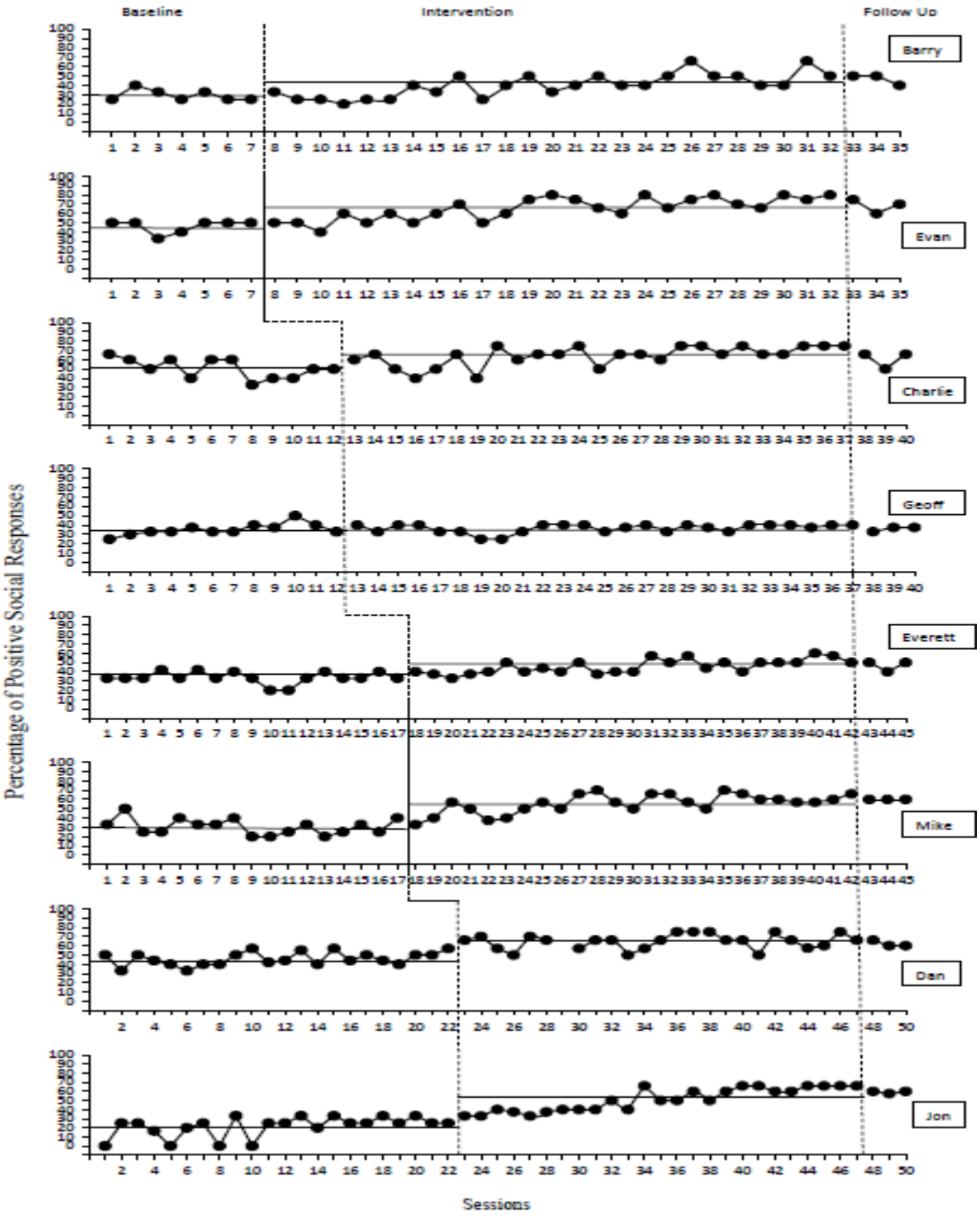

Figure 3. *Positive Social Responses*.

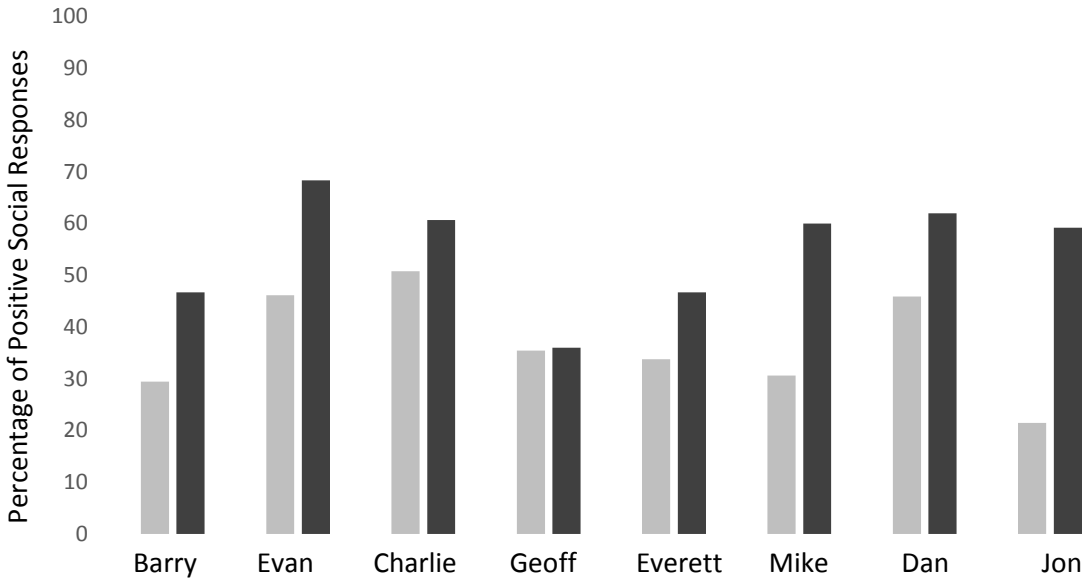

Figure 4. *Pre- and Post-Intervention Positive Social Responses.*

During baseline, Barry displayed a mean of positive social responses for 29.4% of opportunities (range: 25-40%) in a 10-minute period during recess. His individual goal of 25% increase in positive social responding during the intervention phase was positive social responses for 36.8% of opportunities within a 10-minute period during recess. During the intervention phase, Barry had a mean of 40.24% of positive social responses. His positive social responses ranged from 20% to 66% of opportunities per recess period. Barry met his individual goal of 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the sessions of the third storybook. Evan displayed a mean of positive social responses for 46.14% of opportunities with a range of 33% to 50% during baseline. His individual goal of a 25% increase in positive social responding during the intervention phase was positive social responses for 57.68% of opportunities within a 10-minute period during recess. During the intervention phase, Evan had a mean of 65.12% of positive social responses with a range of 40% to 80% of opportunities. He met his individual goal for a 25% increase in positive social responding during the sessions of storybook two. Furthermore, Barry and Evan maintained and improved their intervention per-

formance levels during the follow-up phase one week after intervention ceased with positive social responding of 46.7% and 68.33% respectively.

The next dyad of participants to enter intervention was Charlie and Geoff. During baseline, Charlie displayed a mean of positive social responses for 50.75% of opportunities (range: 33-60%) in a 10-minute period during recess. His individual goal of 25% increase in positive social responding during the intervention phase was positive social responses for 63.44% of opportunities within a 10-minute period during recess. During the intervention phase, Charlie had a mean of 64.16% of positive social responses. His positive social responses ranged from 40% to 75% of opportunities per recess period. Charlie met his individual goal of 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the sessions of the fourth storybook. During the follow-up phase one week after intervention ceased, Charlie displayed a mean of positive social response for 60.67% of opportunities although he did not maintain his goal performance level for this skill. Geoff displayed a mean of positive social responses for 35.42% of opportunities with a range of 25% to 50% during baseline. His individual goal of a 25% increase in positive social responding during the intervention phase positive was social responses for 44.32% of opportunities within a 10-minute period during recess. During the intervention phase, Geoff had a mean of 36.54% of positive social responses with a range of 25% to 40% of opportunities. He did not meet the individual goal of a 25% increase in positive social responding during the intervention phase with a follow-up level of positive social responding of 36% of opportunities.

The third dyad of participants to enter intervention was Everett and Mike. During baseline, Everett displayed a mean of positive social responses for 33.76% of opportunities (range: 20-42%) in a 10-minute period during recess. His individual goal of 25% increase in positive

social responding during the intervention phase was positive social responses for 42.2% of opportunities within a 10-minute period during recess. During the intervention phase, Everett had a mean of 45.78% of positive social responses. His positive social responses ranged from 37.5% to 60% of opportunities per recess period. Everett met his individual goal of 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the sessions of the fourth storybook. Mike displayed a mean of positive social responses for 30.59% of opportunities with a range of 20% to 50% during baseline. His individual goal of a 25% increase in positive social responding during the intervention phase was positive social responses for 38.24% of opportunities within a 10-minute period during recess. During the intervention phase, Mike had a mean of 55.7% of positive social responses with a range of 33% to 70% of opportunities. He met his individual goal of a 25% increase in positive social responding during the sessions of storybook one. Furthermore, Everett and Mike also maintained and improved their intervention performance levels during the follow-up phase one week after intervention ceased with positive social responding of 46.67% and 60% respectively.

The final dyad of participants to enter the *TIFY* intervention was Dan and Jon. During baseline, Dan displayed a mean of positive social responses for 45.91% of opportunities (range: 33-57%) in a 10-minute period during recess. His individual goal of 25% increase in positive social responding during the intervention phase was positive social responses for 57.39% of opportunities within a 10-minute period during recess. During the intervention phase, Dan had a mean of 61.9% of positive social responses. His positive social responses ranged from 50% to 75% of opportunities per recess period. Dan met his individual goal of a 25% increase over the baseline mean for 3 out of 5 consecutive sessions during the sessions of the third storybook. Jon displayed a mean of positive social responses for 21.44% of opportunities with a range of 0% to

33% during baseline. His individual goal of a 25% increase in positive social responding during the intervention phase was positive social responses for 26.8% of opportunities within a 10-minute period during recess. During the intervention phase, Jon had a mean of 51.04% of positive social responses with a range of 33% to 66% of opportunities. He met the individual goal of a 25% increase in positive social responding during the sessions of the first storybook. Furthermore, Dan and Jon also maintained or improved their intervention performance levels during the follow-up phase one week after intervention ceased with positive social responding of 62% and 59.17% respectively.

Research question three. How does the implementation of *The Incredible Flexible You* curriculum affect the appropriate active engagement of participants during recess?

Appropriate active engagement during recess time was recorded utilizing a partial interval time-sampling observational recording system based on 1-minute intervals. The results of the implementation of *TIFY* curriculum on the percentage of intervals of active engagement for all participants during recess are presented in Figure 5. When data were analyzed regarding the alternation of recess time, the data did not show a change in the pattern of behavior for any of the participants. Finally, the pre- and post-intervention results of the implementation of *TIFY* curriculum on the frequency of appropriate active engagement of each participant during recess are presented in Figure 6. These graphs demonstrate the comparison of baseline data to follow-up data for each participant.

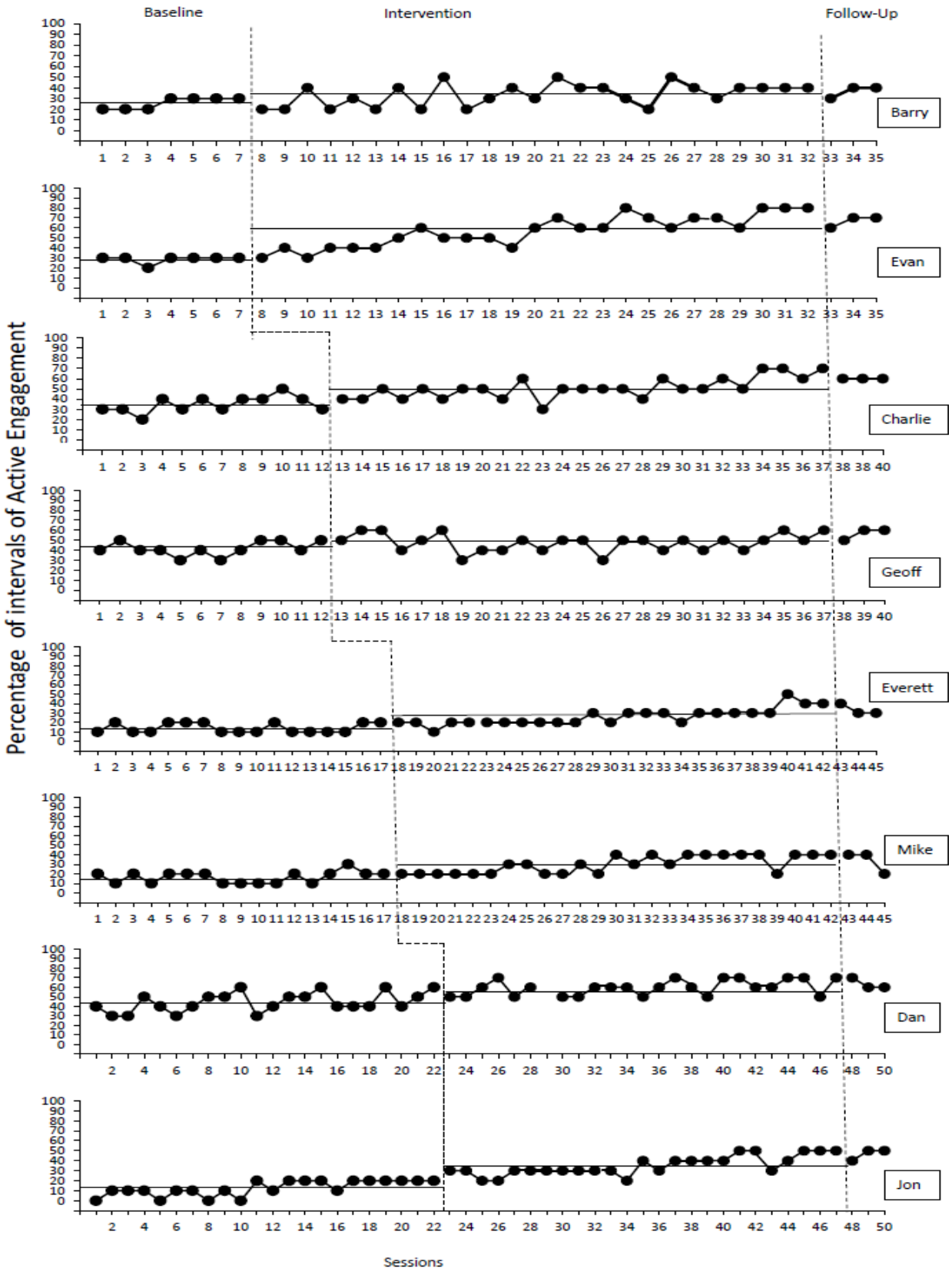

Figure 5. *Appropriate Active Engagement.*

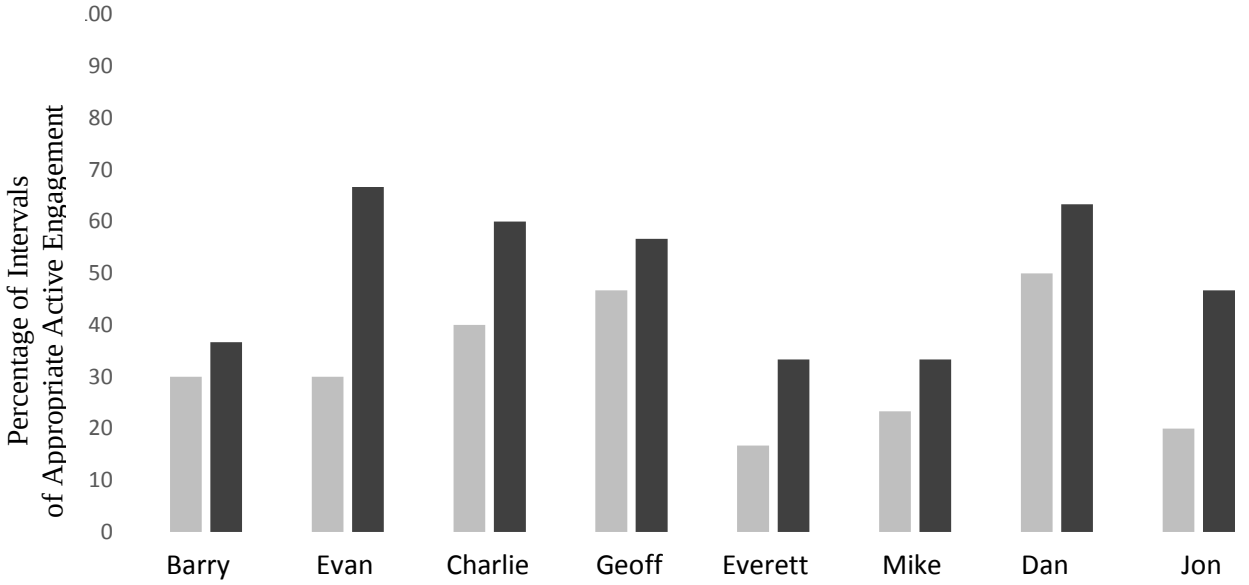

Figure 6. *Pre- and Post-Intervention Appropriate Active Engagement.*

Barry and Evan's levels of active engagement were measured first. During baseline, Barry was actively engaged with his peers for 25.7% of intervals measured for the 10-minute recess period (range: 20-30%). His individual goal for the intervention phase of the research study was to increase his percentage of active engagement by 25% to a performance level of 32.13% of intervals. During the intervention phase, Barry's percentage of active engagement increased to 33.6% of intervals ranging from 20% to 50%. He met his individual goal during the third storybook sessions. Evan's baseline level of active engagement with his peers was 28.57% of intervals, with ranges from 20% to 30% of intervals. His individual goal for the intervention phase was to increase his percentage of active engagement by 25% to a performance level of 35.71% of intervals. During the intervention phase, Evan's percentage of active engagement increased to 56.8% of intervals, ranging from 30% to 80% of intervals. He met his individual goal during the third storybook sessions as well. Within the follow-up phase of the research study, both boys continued to meet or exceed the levels of active engagement reached during the intervention phases (Barry = 36.7%; Evan = 66.67%).

Charlie and Geoff's levels of active engagement were also measured. During baseline, Charlie was actively engaged with his peers for 35% of intervals measured for the 10-minute recess period (range: 20-50%). His individual goal for the intervention phase of the research study was to increase his percentage of active engagement by 25% to a performance level of 43.75% of intervals. During the intervention phase, Charlie's percentage of active engagement increased to 50.8% of intervals ranging from 30% to 70%. He met his individual goal during the third storybook sessions. Geoff's baseline level of active engagement with his peers was 41.67% of intervals, ranging from 30% to 50% of intervals. His individual goal for the intervention phase was to increase his percentage of active engagement by 25% to a performance level of 52.09% of intervals. During the intervention phase, Geoff's percentage of active engagement increased to 47.6% of intervals. He did not meet his individual goal set for active engagement. Within the follow-up phase of the research study, Charlie continued to meet or exceed the levels of active engagement reached during the intervention phases at 60% of intervals. On the other hand, although Geoff did not meet his individual goal during the intervention phase, the follow-up phase data show that Geoff performed above the set individual goal with 56.67% of intervals of active engagement.

Third, Everett and Mike's levels of active engagement were measured. During baseline, Everett was actively engaged with his peers for 14.12% of intervals measured for the 10-minute recess period (range: 10-20%). His individual goal for the intervention phase of the research study was to increase his percentage of active engagement by 25% to a performance level of 17.65% of intervals. During the intervention phase, Everett's percentage of active engagement increased to 26% of intervals ranging from 10% to 20%. He met his individual goal during the second storybook sessions. Mike's baseline level of active engagement with his peers was

16.47% of intervals with a range from 10% to 30% of intervals. His individual goal for the intervention phase was to increase his percentage of active engagement by 25% to a performance level of 20.59% of intervals. During the intervention phase, Mike's percentage of active engagement increased to 30% of intervals with a range from 20% to 40% of intervals. He met is individual goal during the third storybook sessions. Within the follow-up phase of the research study, both boys continued to meet or exceed the levels of active engagement reached during the intervention phases with both boys displaying active engagement during 33.33% of intervals.

Finally, Dan and Jon's levels of active engagement were measured. During baseline, Dan was actively engaged with his peers for 44.55% of intervals measured for the 10-minute recess period (range: 30-60%). His individual goal for the intervention phase of the research study was to increase his percentage of active engagement by 25% to a performance level of 55.69% of intervals. During the intervention phase, Dan's percentage of active engagement increased to 59.58% of intervals ranging from 30% to 60%. He met his individual goal between the sessions for the second and third storybooks. Jon's baseline level of active engagement with his peers was 12.73% of intervals ranging from 0% to 20%. His individual goal for the intervention phase was to increase his percentage of active engagement by 25% to a performance level of 15.91% of intervals. During the intervention phase, Jon's percentage of active engagement increased to 35.2% of intervals ranging from 20% to 50%. He met his individual goal during the first storybook sessions. Within the follow-up phase of the research study, both boys continued to meet or exceed the levels of active engagement reached during the intervention phases (Dan = 63.33%; Jon = 46.67%).

Research question four. How does the implementation of *The Incredible Flexible You* curriculum affect the overall social functioning of participants?

In order to assess the overall social functioning of each child participant, the Autism Social Skills Profile (ASSP; Bellini, 2006; Bellini & Hopf, 2007) was completed by the same parent of each child pre and post intervention. The ASSP assessed the participant's current level of total social functioning and is divided into three subsets: Social Reciprocity, Detrimental Social Behaviors, and Participation/Avoidance. High scores (total possible overall score = 196) on the assessment items indicate the participant's engagement in socially appropriate behavior, whereas lower scores indicated deficit areas. The results of the implementation of *TIFY* curriculum on the overall social functioning of all participants during recess are presented in Table 2. A paired sample two-tailed t test was conducted on the total social functioning score for each participant. Results of this statistical analysis show that the improvements that were found by the participants were statistically significant on the Total Social Functioning score, $t(7) = 11.428$ and $p = .000$. Overall, the participant's reported improvement was characterized by a large effect.

Table 2. *Results of Autism Social Skills Profile. (ASSP; Bellini, 2006; Bellini & Hopf, 2007)*

	Overall Social Functioning			**Social Reciprocity**		**Detrimental Social Behaviors**		**Participation/Avoidance**	
	Pre-Test	**Post-Test**	**% change**	**Pre-Test**	**Post-Test**	**Pre-Test**	**Post-Test**	**Pre-Test**	**Post-Test**
Barry	107	122*	7.7%	46	53	24	27	29	32
Evan	111	132*	10.7%	56	66	19	22	28	35
Charlie	122	132*	5.1%	61	60	24	28	30	33
Geoff	119	133*	7.1%	51	56	31	33	27	33
Everett	100	114*	7.1%	45	47	24	24	24	32
Mike	97	108*	5.6%	38	45	27	26	26	29
Dan	110	129*	9.7%	52	61	21	25	29	34
Jon	101	116*	7.6%	39	49	27	25	28	34

5 DISCUSSION

The purpose of the current study is to provide an initial investigation into the effectiveness of a comprehensive social skills training intervention, *The Incredible Flexible You: A Social Thinking Curriculum for Preschool and Early Elementary Years* (*TIFY*; Hendrix et al., 2013), on the social competence of young children with ASD. Due to the documented need for practitioners in applied, school-based settings to have evidence-based practices that adequately address the social competency of young students with ASD (Chasson, Harris, & Neely, 2007), this research study was conducted within the school setting. Two classrooms for students with ASD in a public elementary school within a suburban county in the Southeastern U.S were utilized. This research study targets eight young children (ages 5–7) who had been diagnosed with ASD, as defined by the characteristics outlined in the DSM-5 (APA, 2013). A diagnosis of ASD is broadly defined as the presence of qualitative impairments in socialization development and communication development, and the presence of restricted repetitive and stereotyped patterns of behavior, interests, and activities. The population targeted historically displays pervasive deficits in socialization characterized by atypical social skill development (Laushey & Heflin, 2000).

A comprehensive theoretical model of ASD was utilized to explain the social deficits of individuals with ASD. Executive functioning (EF), Theory of Mind (ToM), and weak central coherence (WCC) are the triad of theories that aim to explain the unique differences that this population experiences. TIFY curriculum authors utilized this theoretical basis in order to develop lessons that specifically address these differences in social functioning. Within each storybook lesson, the authors take the readers through experiences where the characters must use their executive functioning skills to problem solve when challenging situations occur. ToM is addressed throughout the program when instructing the participants to “listen with your whole

body" and how personal actions have an effect upon other people's feelings. Finally, the authors address WCC through instructing the participants to work together toward a group goal.

Conclusions

Positive social initiations. The results of the implementation of the *TIFY* curriculum on the frequency of positive social initiations of each participant during recess are presented in Figure 1. Although none of the participants' data showed immediate change in level to demonstrate an immediacy of effect, all participants have met their individual goals of 25% improvement over the baseline mean for 3 out of 5 consecutive sessions at different points in time throughout the intervention phase for positive social initiations. When visually analyzing the data patterns, the data demonstrate overall mean improvements. However, the data consistently show a long latency for change throughout the duration of the intervention phase. Additionally, the data demonstrate significant variability during intervention for positive social initiations. During the follow-up session conducted one week after the intervention phase ceased, all participants maintained levels of positive social initiations that are at or above the intervention mean. After close visual analysis of the data, it is unclear that the implementation of the *TIFY* curriculum is responsible for the participant's change in the frequency of positive social initiations. Finally, reviewing the pre- and post-intervention results, all participants demonstrated a modest improvement of positive social initiations from the baseline to follow-up phases.

Positive social responses. The results of the implementation of the *TIFY* curriculum on the percentage of positive social responses of each participant during recess are presented in Figure 2. Although none of the participants' data show immediate change in level to demonstrate an immediacy of effect, most participants have met their individual goals of 25% improvement over the baseline mean for 3 out of 5 consecutive sessions at different points in time throughout the

intervention phase for positive social responses. The only exception is that Geoff did not meet his individual goal for positive social responses during the intervention phase. Similarly to the data measuring positive social initiations, the data for positive social responses demonstrate slight overall mean improvements coupled with a long latency for change in the intervention phase. Visual analysis of the data also show variability during intervention for all participants. Follow-up data demonstrate that most of the participants, with the exclusion of Geoff, maintained levels of positive social responses that are at or above the intervention mean. These undifferentiated data patterns suggest that other factors could be affecting the slight behavioral change of the participants. Therefore, in regards to the *TIFY* curriculum's effect upon the positive social responses of the participants, it is unclear that the slight improvements noted were due to the intervention and that a functional relation was not present. However, when reviewing the pre- and post-intervention data presented in Figure 4, all participants demonstrated modest improvements in positive social responses after the *TIFY* intervention ceased.

Appropriate active engagement. The results of the implementation of the *TIFY* curriculum on the percentage of intervals of appropriate active engagement of each participant during recess are presented in Figure 3. Although none of the participants' data show immediate change in level to demonstrate an immediacy of effect, all participants have met their individual goals of 25% improvement over the baseline mean for 3 out of 5 consecutive sessions at different points in time throughout the intervention phase for appropriate active engagement. As with the two previous dependent variable outcomes, data patterns for appropriate active engagement for all participants show no immediacy of effect and a long latency of change. Visual analysis confirm that all participants maintained intervention levels of performance during the follow-up phase of the research study. The data do not show convincing evidence that the *TIFY* curriculum was in

fact the impetus to the participant's behavioral change in regards to appropriate active engagement. However, pre- and post-intervention data presented in Figure 6 demonstrate that the *TIFY* curriculum had modest effects on the appropriate active engagement of all participants during the recess setting.

Overall social functioning. The results of the implementation of the *TIFY* curriculum on the overall social functioning of the participants during recess are presented in Table 2. The pre- and post-intervention data gathered from the ASSP (Bellini & Hopf, 2007) were analyzed utilizing a paired sample two-tailed t test. Overall, the data show that the participant's improvement in total social functioning observed by their parent was statistically significant, $t(7) = 11.428$ and $p = .000$. Therefore, the reported results support the conclusion that the *TIFY* curriculum had a positive effect upon the overall social functioning of the participants.

Summary

Practitioners continue to search for school-based interventions that address the qualitative impairment in the area of socialization, one of the hallmark deficits of ASD (Laushey & Heflin, 2000; Rao et al., 2008). Researchers consistently note that it is crucial that individuals with ASD receive interventions targeting social-cognitive deficits from an early age and consistently throughout their lifetime (Krantz, 2000). This study adds to the research base to provide an initial investigation of the impact of *TIFY* curriculum (Hendrix et al., 2013) upon the social competence and related social behaviors of young students with ASD. Results show a slight increase in targeted social behaviors within the generalized setting for children with ASD during and after the implementation of *TIFY* curriculum. However, after close visual inspection of the multiple baseline graphs, the results do not provide sufficient evidence to conclude that a functional relation exists between the *TIFY* curriculum and the dependent variables.

Because the *TIFY* curriculum is a comprehensive package that presents complex social concepts that build upon one another, pre- and post-intervention data were examined. Comparison of baseline data and follow-up data show modest improvements for all participants in positive social initiations, positive social responses, and appropriate active engagement during the recess setting. This documented improvement suggests that when addressing the social skill deficits of individuals with ASD, the entire *TIFY* curriculum package must be implemented.

Limitations

Sample size. The total sample size for this research study was 8 young children with ASD in self-contained classrooms within a public school system. Whereas 8 participants are sufficient for single-case research design, this does limit the external validity of the current study's findings. Because of this small sample size, the results of this study may not be generalizable to a larger population of students with ASD. A larger sample size will assist in the generalizability of findings.

Gender. Because the participants were all male for this study, generalization across gender is obviously limited. However, current prevalence reports issued by the CDC state that a diagnosis of ASD is five times more common in boys than in girls (1 in 42 boys; 1 in 189 girls). Thus, the 8 male participants included in this study were a direct reflection of the overall population of students with ASD. More research is required to determine if the *TIFY* curriculum would produce the same effects with female participants.

Measurement of overall social functioning. The ASSP (Bellini et al., 2007) was utilized to measure the overall social functioning for each participant within this study. One parent of each child participant completed a pre- and post-intervention scale to provide input regarding their child's social functioning. The parents were asked to complete this measure within this

study in an attempt to determine if the social concepts learned within the *TIFY* curriculum implementation generalized into the home environment. However, future researchers may desire to have school personnel whom work closely with the participants provide the information for the measure of overall social functioning. This modification would provide more information on how the participant's overall social functioning changed within the setting in which the instruction was delivered, as opposed to a generalized setting.

Implications for Future Research

This study supported previous research on social interventions for young children with ASD with respect to emphasizing the importance of teaching children not just how to engage in appropriate social skills, but also the reasons why they should do so. Additionally, the *TIFY* curriculum addresses the importance of incorporating multiple strategies in the training program that directly target generalization to the natural environment. However, until more research, both single-case and group design, has been conducted to examine the effectiveness of this approach, caution should be taken when using the *TIFY* curriculum within the applied school setting. Leaf et al. (2016) warn that due to the lack of empirical evidence in the effectiveness of programs rooted in Winner's Social Thinking the implementation of these programs with individuals with ASD may be a waste of time, money and energy for all involved. However, if practitioners choose to utilize *TIFY* with their students, implementation should involve continual monitoring and evaluation at the individual-level to inspect the impact of the intervention.

Social competency is not a performance deficit for individuals with ASD, yet it is a complex skill deficit that requires systematic daily instruction for this population. Social competency embodies all discrete social skills. Whereas many social interventions have addressed the discrete social skills of students with ASD, these interventions may not train enough skills for the

participants to obtain social competency. In a meta-analysis of social programs implemented in school-based settings with children with ASD, Bellini et al. (2007) presented results that suggest school-based social skill programming for this population is minimally effective. The results of this study support their findings. Bellini and McConnell (2010) argue that social interventions implemented in school-based settings often are not implemented in a systematic fashion.

Additionally, one of the critical components of programs deemed effective for teaching social competency to students with ASD is the use of schedules of reinforcement in tandem with the intervention program. Providing positive reinforcement immediately following the performance of a desired behavior increases the likelihood that the behavior will reoccur. Cooper et al. (2007) explain that adult attention has shown to be one of the most parsimonious, powerful, and effective reinforcers available. Pairing social reinforcers such as physical contact (i.e. high fives), proximity (i.e. standing near the child), attention and behavior-specific praise with *TIFY* curriculum may impact the effectiveness of the program. Additionally, the use of antecedent interventions to prime students for the behavioral expectations prior to entering different environments is often utilized to set students up for successful social interactions with their peers. Future researchers should consider the effects of the *TIFY* curriculum combined with behavioral contingencies of reinforcement during implementation to determine if this combination could increase the effectiveness of the intervention. When addressing the social needs of students with ASD within the school setting, school personnel should look for opportunities to teach and reinforce social skills as frequently as possible throughout the school day across individuals and environments.

Previous research in the area of socialization for young children with ASD focuses upon the training of discrete social skills (Flynn & Healy, 2012). When utilizing an intervention to

train discrete skills such as greeting another peer by saying “hello”, results can often show a strong causal relationship between the intervention and the dependent variables. However, when an intervention is designed to train participants in the abstract underlying social constructs that drive their social interactions, there may be a decreased magnitude of effect upon visual analysis. Because *TIFY* curriculum focuses more upon the training of social constructs, the intervention may require longer periods of time for participants to show improvements in the quality of their interactions. The *TIFY* program is specifically designed that each outlined lesson and accompanying storybook builds upon the previous lesson and storybook. Therefore, the effectiveness of this program upon the social competency of the participants is best evaluated at the conclusion of the implementation of the entire program.

Another consideration for future research is the possibility of videotaping during data collection. Systematic direct observation of participant’s behavior within a naturalistic setting can be extremely challenging. Observational data can be negatively impacted by the observer’s ability to accurately collect the data without distraction. Videotaping the participants within the recess setting, where observational data were collected, may assist in circumventing the possible effects of observer drift during data collection.

Finally, because the *TIFY* curriculum is a manualized program, replication studies must be conducted (White et al., 2007). Group experimental research designs which include a control group and random assignment need to be conducted to measure program effectiveness for a larger population. This single-case research study used a small sample size to determine if an improvement in social competency was noted with this specific group of children. Larger samples of students across gender and culturally diverse groups are needed. Additionally, longitudinal research may be important to follow student’s social concept development over time.

Conclusion

Due to the wide range of social competency deficits common in young children with ASD, as well as the detrimental outcomes that are connected to the presence of these social impairments, it is decisively important to identify targeted social interventions that are effective and evidence-based for this population. Despite the growing frequency of utilizing the *TIFY* curriculum in school-based settings to address the social competency challenges of young children with ASD, the effectiveness of this approach is unclear. The purpose of this study was an initial research study to determine the effectiveness of the *TIFY* curriculum in improving the social competence of young children with ASD. As described above, the findings of this study failed to show a functional relation between the *TIFY* curriculum and the dependent variables measured.

In summary, the issue remains that there is a strongly documented need for practitioners in applied, school-based settings to have evidence-based practices that adequately address the social competency of young students with ASD (Chasson, Harris, & Neely, 2007). The results of this study suggest that improvement of these social concepts is possible, yet may take long periods of time to observe lasting results. Furthermore, it is hoped that the procedures, findings, limitations, and recommendations for future research revealed in this study will have an impact on later research studies examining the effectiveness of the *TIFY* curriculum in addressing the social competence of young children with ASD.

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APPENDICES

Appendix A

PROCEDURAL FIDELITY CHECKLIST

Date: _____ Time: _____

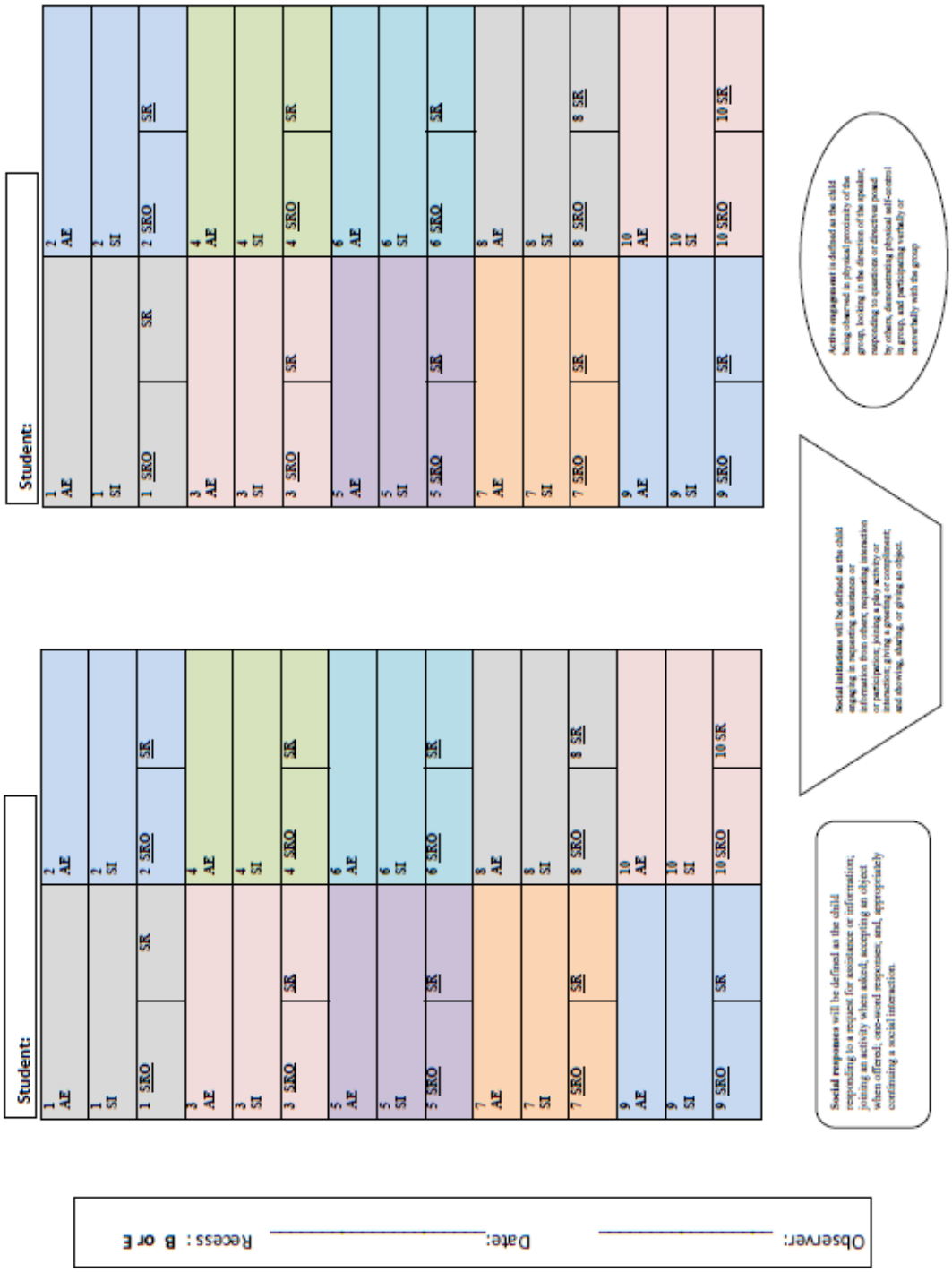
Week: _____ Observer: _____

Baseline ☐ Intervention ☐

	Item	Yes	No	Not Applicable
1	Teacher engaged students in opening routine defined in *TIFY* lesson			
2	Teacher read the social storybook that corresponds with *TIFY* lesson			
3	While reading lesson social storybook, teacher engaged students in teachable moments suggested in *TIFY* lesson			
4	Teacher engaged students in structured activities provided in each lesson in *TIFY* curriculum			
5	Teacher reinforced the targeted concept and vocabulary during dramatic play activity defined in *TIFY* lesson			
6	Teacher engaged students in the closing routine defined in *TIFY* lesson			
7	Teacher utilized visual supports suggested in *TIFY* lesson			

Appendix B.

Direct Observation Data Collection Sheet



Appendix C

Subset Questions for ASSP Scoring (Bellini & Hopf, 2007)

Subscale 1: Social Reciprocity
(# items = 23; eigen value = 10.8; Cronbach's α = .921; test–rest reliability = .89)
Takes turns during games and activities
Asks questions about a person
Asks questions about topics
Maintains "give and take" of conversations
Expresses sympathy for others
Acknowledges others' interests
Recognizes the facial expressions of others
Understands the jokes or humor of others
Considers multiple viewpoints
Offers assistance to others
Verbally expresses how he/she is feeling
Responds to the greetings of others
Joins a conversation without interrupting
Initiates greetings with others
Provides compliments to others
Politely asks others to move out of the way
Acknowledges compliments from others
Responds to questions directed at him/her
Compromises during disagreements
Introduces self to other
Maintains personal hygiene
Speaks with an appropriate volume
Maintains appropriate distance with peers

Subscale 2: Social Participation/Avoidance
(# items = 12; eigen value = 7.6; Cronbach's α = .891; test–retest reliability = .86)
Invites peers to join in activities
Joins in activities with peers
Interacts with peers during unstructured activities
Interacts with peers during structured activities
Engages in one-on-one peer interactions
Interacts with groups of peers
Allows peers to join him/her in activities
Responds to peer invitations to join in activities
Engages in positive peer interactions
Engages in solitary interests and hobbies
Exhibits fear or anxiety about social interactions
Engages in solitary activities near peers

Subscale 3: Detrimental Social Behaviors
(# items = 10; eigen value = 5.2; Cronbach's α = .848; test–retest reliability = .84)
Changes conversation topic to fit self interests
Misinterprets the intentions of others
Makes inappropriate comments
Ends conversations abruptly
Fails to read cues to terminate conversations
Experiences negative peer interactions
Engages in socially inappropriate behaviors
Exhibits poor timing with his/her social initiations
Recognizes the "body language" of others
Is manipulated by peers

Excluded Items
(Factor loadings < .32 or communalities < .25)
Responds slowly in conversations
Allows others to assist him/her with tasks
Requests assistance from others
Maintains eye contact

Appendix D

Adapted Behavioral Intervention Rating Scale

Adapted Behavioral Intervention Rating Scale

Your student has just participated in the social intervention titled "*The Incredible Flexible You*" aimed to improve his/her socialization skills. Please evaluate the intervention by circling the number which best describes your agreement or disagreement with each statement. You must answer each question.

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree
1	*TIFY* would be an acceptable intervention for the child's social problems.	1	2	3	4	5
2	Most teachers would find *TIFY* appropriate for social behavior problems.	1	2	3	4	5
3	*TIFY* should prove effective in changing the child's social behavior.	1	2	3	4	5
4	I would suggest the use of *TIFY* to other teachers.	1	2	3	4	5
5	The child's social problem is severe enough to warrant the use of *TIFY* intervention.	1	2	3	4	5
6	Most teachers would find *TIFY* suitable for the social problems of their students.	1	2	3	4	5
7	I would be willing to use *TIFY* in the classroom setting.	1	2	3	4	5
8	*TIFY* would not result in negative side effects for the child.	1	2	3	4	5
9	*TIFY* would be an appropriate intervention for a variety of children.	1	2	3	4	5
10	*TIFY* is consistent with those I have used in classroom settings.	1	2	3	4	5
11	*TIFY* was a fair way to handle the child's socialization problems.	1	2	3	4	5
12	*TIFY* is reasonable for socialization problems.	1	2	3	4	5
13	I like the procedures used in *TIFY*.	1	2	3	4	5
14	*TIFY* was a good way to handle this child's socialization problems.	1	2	3	4	5
15	Overall, *TIFY* would be beneficial for the child.	1	2	3	4	5
16	*TIFY* would quickly improve the child's behavior.	1	2	3	4	5
17	*TIFY* would produce a lasting improvement in the child's socialization.	1	2	3	4	5
18	*TIFY* would improve the child's socialization to the point that it would not noticeably deviate from other classmates' socialization.	1	2	3	4	5
19	Soon after using *TIFY*, the teacher would notice a positive change in socialization.	1	2	3	4	5
20	The child's socialization will remain at an improved level even after *TIFY*.	1	2	3	4	5
21	Using *TIFY* should not only improve the child's socialization in the classroom, but also in other settings (e.g., other classrooms, home).	1	2	3	4	5
22	When comparing this child with a socially competent peer before and after use of *TIFY*, the child's and peer's socialization would be more alike after using *TIFY*.	1	2	3	4	5
23	*TIFY* should produce enough improvement in the child's socialization so that it is no longer a problem in the classroom.	1	2	3	4	5
24	Other behaviors related to socialization also are likely to be improved by *TIFY*.	1	2	3	4	5