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Effectiveness of Social Story Interventions

for Children with Asperger's Syndrome

by

Frank J. Sansosti

A thesis submitted in partial fulfillment
of the requirements for the degree of
Education Specialist
Department of Psychological and Social Foundations
College of Education
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Keywords: autism spectrum disorders, social skills training, communication, peer interaction, visual supports

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Effectiveness of Social Story Interventions
for Children with Asperger's Syndrome

Frank J. Sansosti

ABSTRACT

The purpose of this study was to investigate the effects of individualized social story interventions on the social communication skills of three children with Asperger's Syndrome. Using a multiple-baseline across participants design, social stories were implemented and direct observations of the participants' identified target behaviors were collected three times per week during unstructured school activities (e.g., recess). Data revealed an increase in the social communication skills of two of the three participants when the treatment was implemented. In addition, maintenance of treatment effects was observed in two participants. These data support recommendations for using social stories to teach social skills to children diagnosed with autism spectrum disorders.

Chapter I

Introduction

Aspergers Syndrome (AS) is a relatively new category of developmental disorder that has come into more general use during the last twenty years despite its shared history with autism. AS is a term currently used to describe the mildest and highest functioning end of autism spectrum disorders. Like autism, AS is a Pervasive Developmental Disorder (PDD) characterized by deficits in three broad aspects of development: (a) social interaction and use of social skills; (b) use of language for communicative purposes; and (c) repetitive and/or perseverative features and/or limited, but intense, range of special interests (Bauer, 1996). In addition to these clinical similarities, researchers, clinicians, and parents have suggested additional considerations regarding the presentation of children with AS. Specifically, many have noted that children with AS possess higher cognitive abilities (often academically high-functioning), normal language function compared to other PDDs, and motor impairments and/or clumsiness (e.g., Bauer, 1996; Rietschel, 2000; Shery, 2000; Volkmar & Klin, 2000; Wallace, 2000; & Wing, 2000). Further, children with AS are often viewed as having an awareness of and need to actively seek friendships, an observation not generally seen in children with autism.

Characteristic of all PDDs, AS shares a common deficit in social abilities that remain the greatest life challenge for these individuals. In a review of research, Wing

(1988) categorized three general types of social impairments frequently observed in individuals with autism and PDD: (a) impaired social recognition (i.e., apathy toward social interaction), (b) impaired social communication (i.e., expressive and receptive language deficits), and (c) impairment of social imagination and understanding (i.e., perspective taking). Specifically, children with AS often do not interact with peers, possess poor appreciation of social cues, and often make socially and emotionally inappropriate responses (e.g., laughing loudly when another student gets hurt).

To better understand such patterns, some investigations have turned to understanding the capacity and nature for social cognition, which is characteristic of all human social interactions (Mundy & Stella, 2001). Such social cognition is currently believed to follow a developmental progression and refers to the ability to infer the mental states of others (e.g., knowledge, perspectives, beliefs, intentions) from behavior. This hypothesized component is what Leslie (1987) referred to as "Theory of Mind" (ToM). ToM is largely governed by indirect, socially mediated cues that occur at a subconscious level. However, children with autism spectrum disorders are often blind to these social cues. Such *mindblindness*, or the inability to mentally depict the behavior of others, does not allow a child with AS to distinguish his/her own thoughts or feelings from the thoughts and feelings of others (Baron-Cohen, 1995; Leslie, 1987, 1993). Following such logic, individuals with AS will have difficulty understanding social information, thereby compromising his/her ability to engage in reciprocal social interactions.

Despite the unique profile of severe deficits in social and communication abilities in the presence of cognitive and language strengths (Klin & Volmar, 2000), children with

AS are often considered to be functioning normally but with odd behaviors (Wallace, 2000). Often educators identify children with AS as "too bright" or "too verbal" (Klin & Volmar, 2000) and associate poor performance on nonverbal tasks to negativism or other intentional behaviors (Safran, 2001). As a result, these children may be viewed as behaviorally disordered and exhibiting conditions similar to Attention Deficit Hyperactivity Disorder (ADHD) (Volkmar, Klin, Schultz, Rubin, & Bronen, 2000). In fact, Church, Alisanski, and Amanullah (2000) found that "the most frequent diagnosis or educational label was ADHD (20%)" (p. 14). In addition, children with AS are viewed by their peers as eccentric and peculiar. The inappropriate social skills and obsessive interests in obscure subjects of the child with AS only cause them to be victims of continued ridicule and further alienation, despite their attempts for friendships (Williams, 1995). Such ridicule and torment, combined with the inability to cope with change may also cause children with AS to be easily stressed and emotionally vulnerable.

Combing the knowledge of current diagnostic criteria, clinical observations, and recent developments in theory, Bauer (1996) provided a clinical outline regarding the developmental course of children with AS. Such an outline augmented Asperger's (1944) original description of symptoms while aligning the empirical progress in diagnostic trends since Wing's (1988) influential review. However, due to the lack of empirical literature regarding the developmental experiences of children with AS, Bauer could only provide hypotheses regarding the developmental progression of AS. Church, Alinsanski, and Amanullah (2000) later confirmed many of Bauer's original hypotheses through descriptive analysis.

Both the theory laden hypotheses of Bauer (1996) and the descriptive analysis of Church, Alisanski, and Amanullah (2000) illustrate that although social skill abilities are highly variable in individuals with AS, they remain the greatest challenge to overcome. Specifically, children with AS desperately want to fit in, but lack the skills and social knowledge necessary to do so (Bauer, 1996; Church, Alisanski, and Amanullah, 2000). In both reviews, the developmental experiences can be better understood by the following themes: (a) during primary school years, social skill deficits become more prominent and observable by parents and teachers; (b) as children with AS enter middle school, they may begin feeling their differences and generally express heightened sadness, anxiety, and rejection; and (c) teenagers with AS face increased anxiety and ever-increasing social skill deficiencies. Since individuals with AS look perfectly typical, their atypical social behaviors and odd use of language are rarely understood by those around them. Instead, these individuals are often identified as "odd" or "different" (Bauer, 1996; Church, Alisanski, & Amanullah, 2000; Klin & Volkmar, 2000; Volkmar, et. al., & Wallace, 2000), and these children struggle to fit in.

Taken together, these reviews provide educators with the information necessary to build interventions that are more comprehensive and address the critical deficit areas. Despite this burgeoning information base of children with AS in schools, little research has been conducted on the effectiveness of interventions to determine whether and how specific strategies to encourage social integration with children with AS are successful. Nevertheless, several suggestions have been provided for practitioners and researchers that offer useful starting points (Atwood, 2000). Many of these suggestions are offered more for their heuristic value rather than as definitive strategies (e.g., teaching theory of

mind skills, encouraging friendship skills). Further, recent reviews have suggested more direct interventions aimed at facilitating socialization in children with autism spectrum disorders (e.g., social skills training, structured teaching, peer-mediated approaches, peer-tutoring, use of social stories and comic strip conversations) (Atwood, 2000; Rogers, 2000).

A strategy that is increasing in popularity within schools is the use of social stories (Gray, 1998). A social story describes social situations in terms of relevant social cues and often defines appropriate responses. The specific strategy is designed to provide the individual with the necessary perspectives and skills to successfully manage a particularly troublesome social situation. The norms for behavior in the targeted context, the perspective(s) of others, and the specific steps to implementing the appropriate social skill(s) are instructed and modeled through a short visual and written story regarding specific content. Specifically, "a social story is written to provide information on what people in a given situation are doing, thinking or feeling, the sequence of events, the identification of significant social cues and their meaning, and the script of what to do or say; in other words, the what, when, who and why aspects of social situations" (Atwood, 2000, p. 90). The social stories approach began in 1991, and was formally introduced to the field of special education in 1993 with specific rules and procedures for development and implementation (Gray, 1994; Gray & Garrand, 1993).

Gray's social stories interventions, in theory, are supported by the research that children with autism spectrum disorders suffer from an inability to establish ToM skills, and rely heavily on rule-based, governed behavior (Atwood, 2000; Baron-Cohen, 1995; Gray & Garand, 1993; Leslie, 1987, 1993; Mundy & Stella, 2001; Twachtman-Cullen,

1998). However, traditional teaching involves interaction between the teacher and student, creating a social situation whenever instruction occurs (Gray & Garrand, 1993). Considering that children with AS will fail to interpret the social cues accurately, the lesson may hold little relevant meaning (Frith, 1989). Therefore, the use of social stories to increase awareness and understanding of the what, when, who, and why may prove to be more beneficial since the child is using the story as a script for further social interactions.

Unfortunately, a review of the available published research on social stories yielded only six empirical studies relating to the effectiveness of social story interventions used with children with autism. The effectiveness of utilizing social stories to teach individuals with autism have been demonstrated on a wide range of social skills, such as how to monitor volume when singing with others (Fullerton, Stratton, Coyne, & Gray, 1996), how to greet people appropriately and share toys (Swaggart, et. al., 1995), how to reduce tantrum behavior (Kuttler, Myles, & Carlson, 1998; Lorimer, Simpson, Myles, & Ganz, 2002), improving social interactions that occurred during lunch (Norris & Dattilo, 1999), and how to learn new routines, and to respond to changes in routines (Gray & Garrand, 1993).

In each of the studies that have used social stories as an intervention, positive trends in data were observed. However, it is necessary to point out that in all of these studies, the primary participant(s) carried a primary diagnosis of autism and/or other comorbid disorders. In addition, in most of these studies the topic of the intervention was to increase prosocial behaviors (e.g., social awareness, positive social intergration skills). However, their focus was to reduce pervasive problem behaviors (e.g., tantrum behaviors,

spitting, yelling) in participant(s). Therefore, examining the effectiveness of social stories as a positive support in a variety of settings is a relatively new endeavor. Further, it is likely that the increased intellectual, language, social awareness, and behavioral characteristics that typify children with AS will allow for increased outcomes of social story interventions as a means of teaching prosocial behaviors.

Although the research regarding social skills interventions for children with autism has been well documented, very little literature is available regarding the efficacy of interventions for purely AS samples. Notably, many researchers have begun suggesting strategies for improving the social integration of children with AS (e.g., Attwood, 2000; Rogers, 2000; Safran, 2001). Of the many suggestions that are presented as being efficacious in peer-reviewed journals and professional conferences (i.e., social skills training, social stories, structured teaching), none have been empirically validated with children diagnosed with AS. Therefore, it is imperative that research begins focusing on demonstrating that such suggestions are evidence-based approaches.

Rationale

Given that the clinical and diagnostic pattern of dysfunction for children with AS appears to be less pervasive than that of classic autism, AS may be more common than autism, and perhaps more amenable to intervention. In fact, recent prevalence rates suggest that AS occurs at rates as high as 63 per 10,000 births, as compared to rates of 21 to 31 for autism (Hyman, Rodier, & Davidson, 2001). Elevated prevalence rates suggest a large unserved student population, making AS an auspicious challenge for special education.

The most appropriate method to incorporate social skills training in the classrooms for children with AS has received little attention in clinical literature. Although there has been a growing body of research on the treatment efficacy of higher-functioning individuals with autism that offers recommendations for educators, there is a deficit of studies that systematically address the efficacy of social skills interventions with purely AS samples. Furthermore, the current increase in the number of referrals for special educational services for these children necessitates an immediate response by the research community to conduct efficacy studies related to special educational practices. Given such urgency, it may be impractical to wait for large comparative studies. A reasonable alternative is to rely on a combination of integrative approaches and single-subject design studies to make crucial educational decisions. Therefore, a small comparative study of a currently recommended social skills intervention is desirable because it would fill the gap in the research literature as well as contribute knowledge in the area of program design and intervention implementation for children with AS.

Purpose

Further research on the efficacy of using social stories designed to train social skills to individuals with AS is necessary. This study will examine the effectiveness of the use of a social stories intervention designed to increase identified target behaviors in three children with AS as measured by direct observations and pre- posttest data. The present study serves to expand the current body of research in this area by (a) incorporating specific (i.e., frequency of appropriate behavior(s)) measures of treatment efficacy, (b) programming and measuring for generalization of treatment effects, and (c) employing a means of experimental control.

Research Hypotheses

The following hypotheses will be examined:Participants in the social story intervention will show a significant increase in the occurrence of identified target behavior(s) in unstructured natural settings following treatment, as compared to baseline condition.

2. Participants in the social story intervention will demonstrate clinically significant increases in social interactions/social communication.
3. Participants in the social story intervention will maintain positive treatment effects at a 2-week follow-up.
4. Participants will demonstrate improved social behaviors beyond identified target behaviors as rated by parents and teachers on pre and post-test measures.
5. Participants will demonstrate a decrease in unusual behavior patterns as rated by parents and teachers on pre and post-test measures.

Definitions

Autism

The current definition of autism is marked by the presence of three categories of behavioral impairments: (a) a qualitative impairment of reciprocal social interaction; (b) a qualitative impairment in the development of language and communication; and (c) a restricted range of activities or interests (American Psychiatric Association, 1994). Appendix A provides the diagnostic criteria for autism.

Asperger Syndrome (AS)

AS (also called Asperger Disorder) is a term generally used to describe children who exhibit severe and sustained impairment in social interaction and who display

restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 1994). These impairments are similar to, but usually milder than, those seen in autism. However, such disturbances must cause significant disturbance in the child's social/occupational functioning (American Psychiatric Association, 1994). In addition, children with AS generally have normal to high levels of intelligence, exhibit no clinically significant general language delay, and possess poor motor abilities. See Appendix B for diagnostic criteria.

Pervasive Developmental Disorder (PDD)

PDDs are a broad diagnostic category that describe a syndrome of behaviors characterized by severe and pervasive behavioral impairments in three general areas of development: (a) social interaction skills; (b) communication skills; and (c) restricted range of activities or interests (American Psychiatric Association, 1994; Bauer, 1995). Under this broad category are Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder, and PDD-Not Otherwise Specified (PDD-NOS). According to the Diagnostic and Statistical Manual For Mental Disorders-Fourth Edition (DSM-IV), PDD is typically first evident during the first five years of life and is often associated with some level of cognitive impairment separate from deficits noted above.

Higher-Functioning Autism (HFA)

There are currently no explicit diagnostic guidelines for HFA, and it remains a controversy whether AS and HFA actually differ or only differ by severity. Currently, areas of controversy appear to be that: (a) deficits in motor skills only appear in children with AS; (b) language is impaired in children with HFA, but spared for children with AS;

and (c) children with HFA and AS perform cognitively at different levels (Gillberg & Ehlers, 1998; Kugler, 1998; Miller & Ozonoff, 2000).

Theory of Mind (ToM)

ToM is the ability to appreciate and mentalize that other people have mental states based on cues from external behavior and the circumstances of that behavior (Baron-Cohen, 1995; Twachtman-Cullen, 2000). ToM is necessary for interpreting human behavior and offers a mental representation of reality. Without such a representational view of the world, communication and language development are affected.

Social engagement

Social integration is a broad category that can be used to define social interactions. Interactions include identifying social cues (visual or auditory), reciprocity in conversations, and sharing enjoyment, interests, or achievements with other people. Other characteristics include using eye contact, facial expressions, and body posture and gesture to regulate and understand social interactions.

Chapter II
Review of Literature

Overview

Chapter II is dedicated to a review of the literature relevant to this study and covers the history and characteristics of children with Asperger's Syndrome (AS), how AS manifests in school-age children, recommended avenues for social skills interventions, a description of social stories, the clinical effectiveness of social stories, and the predicted effects of the use of social stories with children with AS.

History of Asperger's Syndrome

Although officially recognized in *the Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV; American Psychiatric Association, 1994) for the first time in 1994, AS has a history nearly as long as autism (Volkmar, Klin, Schultz, Rubin, & Bronen, 2000). Prior to the inclusion of AS in the DSM-IV, much of what was known relating to disorders of severe social withdrawal in children, was understood through the description of autism. It has not been until recent years that AS has received heightened attention in English literature, and has now become a battleground for researchers and other mental health professionals to increase our understanding and awareness of it's developmental course, as well as study effective interventions aimed at decreasing the symptoms of such a peculiar disorder.

In 1943, Leo Kanner, a Baltimore child psychiatrist at Johns Hopkins, made his historic publication describing 11 young children with severe social, language, and

cognitive deficits. Kanner emphasized the solitariness of these children, despite the presence of others, as a pervasive lack of interest in social relationships, including their parents. In addition to their aloofness, he described these children as (a) being caught up in restricted, repetitive, stereotypic movements, noises, and routines; (b) having an inability to adapt to novel environments and insist on sameness; and (c) displaying language characterized by echolalia (the echoing of other's speech), pronoun reversal, and literalness, if language developed at all (Klin & Volkmar, 1999). Captivated by the children's all-absorbing fascination with the inanimate environment, Kanner conceptualized that these children suffered from a possible congenital disturbance that affected the child's capacity to relate emotionally to others (Klin & Volkmar, 1999). According to Kanner (1943), such a disturbance resulted in social withdrawal and aloneness, or, *infantile autism*.

Only one year after Kanner's publication, Hans Asperger, a Viennese pediatrician specializing in remedial education, published his independent description of boys suffering from severe social isolation, despite having what appeared to be good language and cognitive skills. Much like Kanner's description, Asperger identified these children as having social and communication problems that made it difficult for them to participate in group activities and develop friendships (Klin & Volkmar, 1999). Unaware of Kanner's work in the United States, Asperger chose the label *autistic psychopathy*, emphasizing that these children suffered more from a personality disorder. Although Asperger did not provide a list of essential diagnostic criteria, he emphasized the following behavioral and clinical descriptions (as listed in Wing, 1998b):

1. The children were socially odd, naïve, inappropriate, emotionally detached from others.
2. They were markedly egocentric and highly sensitive to any perceived criticism, while being oblivious of other people's feelings.
3. They had good grammar and extensive vocabularies. Their speech was fluent but long-winded, literal and pedantic, used for monologues and not for reciprocal conversations.
4. They had poor nonverbal communication and monotonous or peculiar vocal intonation.
5. They had circumscribed interests in specific subjects, including collecting objects or facts connected with these interests.
6. Although most of the affected children had intelligence in the borderline, normal, or superior range on tests, they had difficulty in learning conventional schoolwork. However, they were capable of producing remarkably original ideas and had skills connected with their special interests.
7. Motor coordination and organization of movement was generally poor, although some could perform well in areas of special interest to them, such as playing a musical instrument.
8. The children conspicuously lacked common sense (p. 12-13).

Both Kanner and Asperger highlighted the same types of deficits in their patients, and although the two descriptions were quite similar, they were not completely identical. In addition to their commonalities, Asperger noted other features present in his descriptions. These included idiosyncratic areas of "special interest," that were much of

a focus in the child's life, awkward and clumsy motor skills, as well as difficulties in understanding social cues, and odd, eccentric patterns of repetitive interests. Although Kanner's work became of particular clinical interest in English literature, Asperger's concept remained limited to Germanic writings until Lorna Wing's influential review in 1981.

Contemporary Descriptions of Asperger's Syndrome

Wing's (1981) review of Asperger's work dramatically increased awareness and interest in Asperger's concepts. She also used such concepts to broaden the perception of the autism spectrum to include those children who did not meet criterion for autism but still presented with clear social impairments (Kugler, 1998). Volkmar and Klin (2000) note that since that time, more than 100 publications have been devoted to the further study of AS. Generally, these reports focus on the neuropsychological distinctions and/or commonalities of AS and autism but offers little to the field of education. Studies reviewing the disparity in neurocognitive aspects and profiles between children with AS and Higher-Functioning Autism (HFA) have appeared with increasing frequency in published reports over the past several years (e.g., Klin, Volkmar, Sparrow, Cicchetti, & Rourke, 1995; Manjiviona & Prior, 1999; Miller & Ozonoff, 2000; Ozonoff, Rogers, & Pennington, 1991; Ozonoff, South, & Miller, 2000; and Szatmari, Tuff, Finlayson, & Bartolucci, 1989). Review of these studies presents a mixed bag of results and only promotes greater confusion over the differential diagnosis of AS and HFA and how one can better facilitate learning. Although the advancements in neuropsychology are important, they are beyond the scope of this review, and whether AS and HFA can be viewed as separate disorders remains to be answered within that domain.

Overall, AS and HFA may involve the same fundamental symptomatology, differing only in degree or severity. AS may represent that portion of the Pervasive Developmental Disorder (PDD) continuum that is characterized by higher cognitive abilities and by normal language function (Bauer, 1996). Most professionals agree that the presence of early normal basic language skills is one of the defining characteristics of AS, and this combined with higher cognitive skills and a desire to form relationships (but in awkward ways) distinguishes AS from other forms of autism and PDD.

AS is currently understood as a developmental disorder characterized by children who: (a) have significant difficulties in social interactions and relationships, (b) display lack of empathy that is similar to but usually milder than that seen in autism, and (c) engage in unusual patterns of interest and unique stereotyped behaviors, especially the tendency to over focus on certain topics or subjects of interest (e.g., trains or vacuum cleaners) (Bauer, 1995, 1996; Church, Alisanski, & Amanullah, 2000). Children with AS generally have normal to above normal cognitive abilities (sometimes in the superior range), and language function that is generally stronger than that in other PDDs, but often is unusual in pragmatic ways (Bauer, 1995, 1996; Church, Alisanski, & Amanullah, 2000; Klinger & Dawson, 1996), a diagnostic pattern that is different from that observed in classic autism. In fact, both *DSM-IV* and *ICD-10* specify that for a diagnosis of AS to be made, a history of normal language and cognitive development must be present. Both *DSM-IV* and the *International Classification of Diseases* (ICD-10; World Health Organization, 1992) criteria for AS require the social deficits and repetitive narrow interests as seen in autism (Miller & Ozonoff, 2000).

Researchers, clinicians, and parents have suggested additional considerations regarding how children with AS present. Many have noted that children suspected of AS exhibit some degree of motor impairment, or clumsiness, as well as actively seeking friendships not seen in autism (e.g., Bauer, 1996; Volkmar & Klin, 2000; Wing, 2000; parent essays by Rietschel, 2000; Shery, 2000; & Wallace, 2000). Further, children with AS display deficits in the pragmatic use of language, characterized by perseveration on a topic of interest, irrelevant use of detail in conversations (e.g., using dates and ages when discussing an event or person), abnormal prosody (e.g., abnormal intonation, inappropriate laughing), and ignoring of conversational initiations (Klinger & Dawson, 1996). Although these symptoms are apparent, they do not appear to be overly atypical, and the behaviors of individuals with AS generally are less understood by those around them (Church, Alinsanski, & Amanullah, 2000).

AS can be characterized by deficits in social interaction and stereotyped behavior patterns, yet is not associated with clinically significant deficits in language or cognitive development. Although consideration of the language and behavioral issues are important for any intervention of children with AS, the focus of this review will be a discussion of the social sequelae of AS, and the research that is available to support the sequence of social dysfunction.

Social Impairments in Individuals with Asperger's Disorder

As is the case with all disorders under the PDD continuum, AS shares a common characteristic of poor, or absent, social relatedness and erroneous use of social skills (Bauer, 1996). In a review of the research literature on the social impairments of individuals with autism spectrum disorders, Wing (1988a) summarized the ways social

interactions are impaired. Impairment in social interactions can vary, depending on the severity of the dysfunction, but Wing (1988a) divided these impairments into three separate most frequently observed categories: (a) impaired social recognition (i.e., apathy toward social interaction), (b) impaired social communication (i.e., expressive and receptive language deficits), and (c) impairment of social imagination and understanding (i.e., perspective taking). These impairments paired with communication deficits and restricted, stereotypical range of interests makes up the "triad of impairments" (Wing & Gould, 1979). Such impairments are essential in the diagnosis of any disorder within the autism spectrum and remain much of the focus of intervention activities for individuals who fall along this continuum.

As is the case of children with autism, individuals with AS display the same triad of impairment describe above. Specifically, children with AS often do not interact with peers, possess poor appreciation of social cues, and often make socially and emotionally inappropriate responses (e.g., laughing loudly when another student gets hurt). To understand these social interaction patterns, some have turned to theory and research on the nature of social cognition (Mundy & Stella, 2001). The capacity for social cognition, and more importantly, social relationships is a defining characteristic of human neurobehavioral evolution (Cosmides, 1989). In keeping with this view, a perspective on cognition has been suggested that the capacity to understand the intention of others follows a developmental course (Baren-Cohen, 1995; Leslie & Thaiss, 1992). This hypothesized component is based on what Leslie (1987) called the "Theory of Mind" (ToM).

Theory of Mind (ToM)

ToM is the cognitive ability to infer the mental states of others (e.g., knowledge, perspectives, beliefs, intentions) from behavior. Specifically, ToM employs a specific type of cognition called *metarepresentation*. Such ability allows one to mentally depict the psychological status of others (i.e., the thoughts and beliefs of others). It is called *metarepresentation* because "it involves the capacity of one individual to mentally represent the mental representations of another individual" (Mundy & Stella, 2001, p. 58). Baron-Cohen (1995) coined the term *mindblindness* to characterize this inability to read the behavior of others in mental states. Simply stated, a deficit in ToM does not enable a child with AS to distinguish his or her own thoughts or feelings from the thoughts and feelings of others (Leslie, 1987, 1993).

According to this view, a disturbance in ToM gives rise to the social and pragmatic deficits of individuals with AS (Baron-Cohen, 1995; Leslie, 1987). The logic is that these individuals will have difficulty conceptualizing and appreciating the thoughts and feelings of another person (Atwood, 2000). In addition, individuals with AS will exhibit deficits in identifying the communicative intents of others, understanding figures of speech (e.g., idioms), and following the conventions of topic maintenance when speaking (Mundy & Stella, 2001). These difficulties have a major impact on the child's social reasoning skills and behavior. For example, a child with AS may have difficulty identifying whether another child's running into him in physical education class was intentional or accidental. Along the same lines, a child with AS may have difficulty understanding how their own actions (e.g., taking excessively about trains) may affect the thoughts of others around them.

Under normal circumstances, the ability to read social situations and people and to adjust one's communicative behavior is a task that is performed effortlessly (Twachtman-Cullen, 1998). The ability to hold the capacity for ToM is governed largely by the indirect, socially mediated cues that typically are recognized below the level of consciousness. Thus, because children with AS have a specific difficulty in understanding social information, they are particularly compromised in their ability to engage in reciprocal social interactions, an integral part of communication in any society.

Taken together, the clinical and diagnostic pattern of dysfunction for children with AS appears to be less pervasive than that seen in classic autism. Less pervasive symptoms suggest that AS may be considerably more common than autism, as well as more amenable to intervention. Notably, Bauer (1996) reports the prevalence of AS to be as high as 20-25 per 10,000 children, with generally a better prognosis than classic autism; however, it often goes undiagnosed. In a recent Journal of the American Medical Association (JAMA) report, Hyman, Rodier, and Davidson (2001) suggest prevalence rates for AS to be as high as 63 per 10,000 births, as compared prevalence rates of 21 to 31 for autism. Moreover, Safran (2001) reports that prevalence rates that appear to be "several times higher than classic Kanner childhood autism, [and] suggests a large unserved student population in North America (p. 151)." With this in mind, AS becomes an auspicious challenge for special education, and one that is ripe for research.

Asperger's Syndrome in the Schools

Due to recent inclusion in both the *DSM-IV* and the *ICD-10* diagnoses of AS and other higher functioning autism spectrum disorders have increased. This increase has led to increased referrals for special education services and has forced educators to

restructure services to better cater to children with this unique profile of severe social and communication disabilities in the presence of cognitive and language strengths (Klin & Volkmar, 2000). Unfortunately, the resources and services available to such individuals are still limited. To often, children with AS are seen as "too bright," or "too verbal," (Klin & Volkmar, 2000) or considered to be functioning normally but with odd behaviors (Wallace, 2000).

Additionally, educators may be misled by the enhanced verbal abilities of children with AS and may attribute poor social skills and poor performance on nonverbal tasks to negativism or other volitional behaviors (Safran, 2001). As a result, these individuals are viewed as behaviorally disordered or socially maladjusted and placed into special classes for children with behavior problems (Volkmar, Klin, Schultz, Rubin, & Bronen, 2000). Children with AS may typically be viewed as "unusual" or "just different," and miscatogorized as exhibiting conditions similar to Attention Deficit Hyperactivity Disorder (ADHD) or other behavioral or emotional disturbances. In an attempt to describe the experiences of children with AS between the ages of 3 and 15, Church, Alisanski, and Amanullah (2000) found that "the most frequent diagnosis or educational label was ADHD (20%)" (p. 14). Placing children with AS in classes for children with behavioral impairments may lead to their continued experiences of social failures with peers. Often, the child with AS may be ridiculed and tormented for his/her odd and eccentric behaviors in classes designated primarily for children with behavior problems. As Volkmar et al. (2000) explain, this approach might lead to the placement of a child as "a perfect victim, with perfect victimizers" (p. 266).

Using knowledge from recent diagnostic criteria, clinical observations, and current theoretical models, Bauer (1996) provided a clinical outline of children with AS as they progressed through preschool, elementary, and middle/high school. Such an outline combined the empirical progress in diagnostic trends while integrating the many concerns and ideations of what Asperger had originally described nearly 60 years ago. Much of what Bauer (1996) had hypothesized clinically was confirmed through further descriptive analysis by Church, Alisanski, and Amanullah (2000). Combined, these reviews provide educators with critical information, giving professionals in education a more comprehensive model to build interventions.

Preschool

Key elements for educators to be aware of during the preschool years for children suspected of having AS include: (1) a tendency to avoid spontaneous social interactions; (2) impairments in the pragmatic use of social communication; (3) perseverance on particular objects or subjects, with a tendency to only want to talk about such interests; (4) difficulty in regulating social/emotional responses; and (5) an appearance of being "in one's own little world" (Bauer, 1996). Many of these characteristics do not appear to deviate much from what is seen in children within the autism spectrum. However, the child with AS is more likely to show some social interest in other children and with their elevated use of language and conversational ability, they may not present as being obviously "different" from other, more typical, children (Bauer, 1996; Safran, 2001). Volkmar and Klin (2000) indicate that "individuals with AS experience social isolation, but are not withdrawn or devoid of social interest (p. 59)." Thus, children with AS show

an interest in having friends, a finding that contrasts with the pattern found in individuals with autism.

Church, Alisanski, & Amanullah (2000) conducted a retrospective qualitative review of 40 (39 boys, 1 girl) children diagnosed with AS at a university medical center child development program between 1986 and 1998. For each child, at least two investigators reviewed all of the information available for review in the child's chart (e.g., parent, school, and heath-care provider information) to ensure that the child met the DSM-IV criteria for AS. All charts were analyzed qualitatively with emphasis placed on parent comments and observations, observed child behaviors and interactions, and teacher reports. At the time of the data extraction, the children fell into the following groups: (a) preschool aged children (n = 1), elementary aged children (n 26), and middle and high school aged children (n = 13). However, because the children were followed over several years, data were available on 40 preschoolers, 39 elementary aged children, and 18 middle and high school aged children (middle and high school aged children were not collapsed).

Although this study did not employ rigorous observational and quantitative measures, it does provide the reviewer with a developmental progression of what Bauer originally hypothesized. Because so little is known regarding the experiences of children with AS, this study illustrates specific problem areas that need to be addressed and are critical to the child with AS success. Elements of the key findings are reported to emphasize Bauer's (1996) hypotheses.

At the preschool level, children in Church, Alisanski, and Amanuallah's (2000) descriptive study did not stand out as being different enough from their peers to come to

the attention of primary care providers as needing comprehensive assessment. As a group, the children had specific difficulties in social interactions, play skills, and exhibiting odd and unique behaviors. Specifically, the preschoolers appeared to get along with teachers and other adults, but had the most difficulty in initiating, sustaining, and maintaining relationships with other children. Most of the children preferred to be on the periphery of activities, failed to read the social cues of teachers and other students, desired the adherence to specific routines/rituals, and wanted to talk about their area of interest to anyone at any time. Interestingly, 95% of the parents of these children "suspected that something was seriously wrong with their child prior to the start of kindergarten" (p. 13); however, 72% did not receive a formal diagnosis by the end of this period (Church, Alisanski, and Amanuallah, 2000).

Elementary school years

As the child with AS enters kindergarten, educators may pinpoint behavioral concerns (e.g., hyperactivity, inattention, aggression) and more often express concern over "immature" social skills and peer interactions (Bauer, 1996). When these concerns are severe enough, special education services may be suggested, but generally, most children with AS will enter the mainstream setting. Academically, children with AS typically perform well, especially in the areas of rote reading and calculation skills. However, the child's "obsessive" interests may interfere with the classroom setting and at the same time amaze the teacher. Consistent with the preschool years, elementary level children with AS express interest in others, but are unable to make and keep friendships. Bauer (1996) noted that children with AS may tend to associate with a few members of the class, but usually these relationships are relatively shallow and superficial.

Additionally, Prior et al. (1998) noted that children with AS actively look for friendships, but often their method of doing so is clumsy and unsuccessful. Developmentally, children at this age are beginning to seek meaningful friendships. These friendships are those in which trust and assistance become important components, both of which provide positive support for the development of prosocial and altruistic behaviors.

Data available on the 39 elementary aged children (ages 6 to 11 years) in the Church, Alisanski, and Amanullah (2000) study demonstrated similar patterns. Parents, teachers, and physicians reported that children within this age group demonstrated serious developmental problems. In particular, social skills began to emerge as key areas of deficit. Through their review of elementary-aged children's charts, Church, Alisanski, and Amanullah (2000) reported that none of the children in this sample had reciprocal relationships with other children, but some did manage to form superficial relationships (e.g., usually to share information on topics of interest). Another key finding was that elementary-aged children did not have the ability to take the perspective of others. These children often misread social cues (e.g., body language, gestures, facial expressions), and often acted inappropriately (e.g., blurting out socially inappropriate comments and not understanding the impact of those comments on others). In addition to these social problems, these children were extremely rule-based and desired sameness and specific order to be maintained. Language was often used inappropriately, more often to discuss the child's topic of interest and perseverating on the same topic day after day. Although all of the reports by parents and other professionals indicated serious social deficits, only 25 of the 39 children (64%) were formally diagnosed with AS by the time they reached 11 years of age.

Middle and High School years

Bauer (1996) emphasized that the most difficult areas for individuals with AS as they move through middle school and high school are those areas related to socialization and behavioral adjustment. Often, these difficulties only increase, leading a child with AS to become isolated and perhaps ashamed of his/her eccentric behaviors. Subsequently, children with AS may be left out, misunderstood, or teased and persecuted (Bauer, 1996). Their inability to make friends and "fit in" may result in further withdrawal, resulting in some degree of depression. In fact, comorbidity of AS and depression are common in late childhood and adolescence due to the individual's increasing awareness of personal inadequacy in social interactions and repeated failures in making and/or maintaining relationships (Klin & Volkmar, 1997). This awareness is quite different from children with autism who are seemingly unaware of their social deficits. During adolescence, pressure to conform is great and tolerance for differences are at a minimum. It is at this stage that the child with AS may become an outsider, undetermined to find and maintain friends, despite their wishes to hold friendships with peers.

Church, Alisanski, and Amanullah (2000) demonstrated that for individuals with AS, social skills deficits continued to be the major area of difficulty during the middle and high school years. Not only were these deficits in social skills apparent, but also these children stood out socially among their peer group. For example, of the 18 students in their study (13 children followed through middle school and 5 individuals followed through high school), all were described as having an "inability to read the social cues of their peers, awkward body posture, awkward use of gestures, annoying habits such as

making noises or drumming desks, highly variable eye contact, and odd body language" (Church, Alisanski, & Amanullah, 2000, p. 17). Behaviorally, parents reported that many of these children adhered to routines and rituals during middle school, which progressed to obsessive-compulsive behaviors during the high school years. In addition, one third of reports by both parents and teachers described these children as "very inappropriate," "rude," or "silly." Notably, 38% of these children had a secondary diagnosis of a behavior disorder (e.g., oppositional defiant disorder, conduct disorder) (Church, Alisanski, & Amanullah, 2000).

Both the theory laden hypotheses of Bauer (1996) and the descriptive analysis of Church, Alisanski, and Amanullah (2000), illustrate the social specific problems that need to be addressed and are critical to the child's success. Despite this burgeoning information base of children with AS in schools, there has been scant attention paid to AS from the special education literature (Safran, 2001). New information has sparked only limited interest among professionals in education in considering effective interventions for children with AS. Williams (1995) offered strategies for teachers, pinpointing the areas of known deficit. However, many of the suggestions Williams provided are similar to those methods used with children with autism and may not provide optimal benefits for children with AS. Attwood (2000) also made suggestions for improving peer relations for children with AS, outlining many of the techniques used to facilitate social learning in high functioning children with autism. Many of his suggestions have been confirmed by research to be effective for children with HFA (e.g., opportunities to interact with normal children, labeling specific emotions) and may hold promise for children with AS. Further, recent reviews have suggested more direct interventions aimed to facilitate

socialization in children with autism spectrum disorders (e.g., structured teaching, social skills training, peer-tutoring, peer-mediated approaches, use of social stories and comic strip conversations). However, efficacy data are still limited pertaining to purely AS samples (Rogers, 2000; Safran, 2001). In essence, there appear to be few support services for mainstreamed children with AS, a placement that many of these children encounter.

Directions for Intervention

Given the critical information on AS reported in the past few years, it is now necessary to formulate suggestions to be considered when planning and implementing educational interventions for individuals with AS. With the increase in the use of terms such as "Higher Functioning Autism," higher functioning Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS)," or, more importantly, "Asperger's Syndrome," it is imperative that educators and other service providers be cognizant of interventions that will benefit these children with severe social weaknesses despite their cognitive strengths.

Social Stories

One suggestion that has appeared repeatedly in recent years to improve the social integration of children with AS is the use of Social Stories. Social stories are an approach to teach social skills by teaching social understanding through the extensive use of visual materials (Gray, 1994, 1995). A social story is an individualized short story that can be used to assist individuals with autism spectrum disorders in interpreting challenging or confusing social situations (Gray, 1997). According to Gray (1995), social stories focus on providing the student with descriptive information regarding what

is occurring in a given situation and why. Social stories serve a wide variety of purposes, and they appear to be particularly helpful in facilitating the inclusion of students with autism spectrum disorders in mainstreamed classrooms (Gray & Garand, 1993). Examples of social stories from The Social Story Book (Gray, 1994) appear in Appendix C.

Rationale behind social stories. Social stories are based on the growing consensus among researchers that children with autism spectrum disorders suffer from an inability to "read" and understand social cues and situations, perspectives of others, as well as formulating appropriate responses to such social events (Atwood, 2000; Baron-Cohen, 1995; Gray & Garand, 1993; Leslie, 1987, 1993; Mundy & Stella, 2001; Twachtman-Cullen, 1998). Unfortunately, traditional teaching, whether it be a classroom lesson or social skills intervention, generally involves face-to-face interaction between the student and the teacher/facilitator. Therefore, using a traditional teaching approach to teach social behaviors presents the student with what Gray and Garand (1993) identify as a compounded challenge: (a) "understanding the lesson, and (b) accurately interpreting the social cues used in its presentation" (p. 2). Social stories seek to minimize these concerns by providing the student with information regarding (a) the norms for behavior in the context of the specific story, especially the unspoken social expectations in given situations; (b) the perspective(s) of others involved in the social situation; (c) the specific behaviors required for the specified situation; and (d) choices for the individual to make to participate successfully in different social situations (Fullerton, Stratton, Coyne, & Gray, 1996; Gray 1997; Gray & Garand, 1993).

Social stories are offered as a more powerful intervention compared to traditional analog social skills interventions because they dismiss the possibility of a child becoming confused when directly confronted with another individual. Traditional social skills interventions generally involve the process of role-plays and modeling with same-aged peers. However, due to their inability to "mind-read," children with AS may not fully understand the content of these lessons, or, more commonly, become threatened by the presentation of the lesson. As previously discussed, children with AS hold unique perceptions of people and events and respond according to their own rule-based cognitions. This rule-governed behavior affects their understanding of communication and interaction with others resulting in the child's failure to interpret the interaction accurately. The shortcomings of traditional social skills lessons are that they do not include descriptive information regarding how people respond and why, as well as use materials/instruction that will be most easily understood by the child with AS. Under these circumstances, the child with AS may be unable to process, and later use, the information provided because of the highly social nature of its presentation. This is perhaps the rationale behind the limited generalization of social skills training for children with any autism spectrum disorder.

Developing a social story intervention. Gray (1994, 1995) outlined four basic steps, (see Table 1) in the development of a social story intervention. This process involves first targeting a specific problematic social situation that the social story will have its focus. Once a target situation is identified, all of the salient features of the context or setting need to be identified (e.g., where a situation occurs, who is involved, how long it lasts, how it begins and ends, what occurs, and why). Gray (1995, 1998)

states that such information generally can be identified through interviews and extensive observations of the target situation. Observations prior to implementing a social story should be of particular importance because they allow the observer not only to witness the target child's interests and abilities, but also to gain insight into what may be motivating his/her current responses. Gray (1994) provides a sample form (*Social Stories Information*) that can be used to structure the observations, as well as assist in gathering information that is needed to write a successful social story. A copy of this form appears in Appendix D.

Following this initial information gathering process, the educator, clinician, and/or facilitator can then identify a new social skill to be taught using a social story. When considering a new social skill to be taught, consideration of (a) the target situation; (b) the perspective(s) of all individuals present in the context (i.e., child him/herself, others); and (c) the behavioral expectation(s) in the context of the targeted situation (i.e., what should and should not be done and where) must be considered (Gray, 1995).

Table 1.
Steps in the Development of Social Stories (Gray, 1995)

Identify and Target a Social Situation	
	Identify a problematic or potentially problematic social situation.
Gather Information	
	Gather data relative to the target child's interests, abilities, impairments, and factors motivating the current behavior.
	Use videotaped reviews to identify the salient features of the social situation and the target child's perspective of the social situation.
	Determine the focus of the social story to be developed by merging the salient contextual information with the target child's specific perspective and interests
Share Observations	
	Review the information gathered above with the target child and other relevant individuals to determine the accuracy and content relevance of the materials.
Identify and Support New Social Skill	
	Generate the specific social skill, and related behavioral steps necessary to successfully manage the target situation.
	Generate a short social story which describes the target situation, including the identification of the relevant information regarding the context, perspectives of self and others, and desired behavior.

Swaggart et al. (1995) elaborated Gray (1994) and Gray and Garand's (1993) suggestions to developing social stories, and proposed a 10-step process for the creation and implementation of social stories. Their process involved all of the original aspects of social story creation (i.e., identifying a target behavior for change, defining target behavior, writing a social story), but expanded on the process of creating a social story book (e.g., presentation of sentences on a page, use of icons and/or pictures), and methods of implementing a social story. A brief outline of Swaggart et al.'s (1995) social story process follows, and is presented in Table 2.

Table 2.

Steps in the Development and Implementation of Social Stories (Swaggart et al., 1995)

1. Identify a target behavior or problem situation.
2. Define the target behavior of data collection.
3. Collect baseline data on the target behavior
4. Write a short social story using the four sentence types.
5. Present one to three sentences on each page
6. Use photographs, hand-drawn pictures, or icons.
7. Read the social story to the student and model the desired behavior.
8. Collect intervention data.
9. Review the findings and related social story procedures.
10. Plan for maintenance and generalization.

1. *Identify a target behavior or problem situation*. At this stage, the developer of the social story should focus on a behavior that will result in increased positive social interaction or a social learning opportunity.
2. *Define the target behavior of data collection.* The purpose of this stage is to describe the target behavior clearly and concisely. Behaviors should be defined so examples and nonexamples of that behavior are included. The purpose of this is to ensure that anyone reading the definition could precisely identify the desired behavior.
3. *Collect baseline data on the target behavior.* Collecting data over a period of time will allow the developer to recognize any trends. Data on the target behavior should be collected for a period of 3 to 5 days. Baseline data allow the developer to tally the frequency of the behavior, as well as provide a basis for comparison for the individual's behavior during and following the social story intervention.

4. *Write a short social story using the four sentence types.* Always use the first person when writing social stories, and make sure that story describes a situation that is likely to occur in the future.
5. *Present one to three sentences on each page.* Presentation of the story is directly dependent upon the abilities of the individual. However, the format should always be simple and should avoid overloading of information.
6. *Use photographs, hand-drawn pictures, or icons*. Pictures are used to enhance student understanding (this is especially true for lower functioning individuals), but should not define the social situation too narrowly as this could result in limited generalization (Gray, 1994).
7. *Read the social story to the student and model the desired behavior*. This step is perhaps most crucial in the social story intervention, and it should become a consistent part of the student's daily routine/schedule. A social story should be presented several times throughout the day and should occur at the same time everyday.
8. *Collect intervention data*. Data on the target behavior should be recorded throughout the intervention process, and should be collected in the same manner as baseline data.
9. *Review the findings and related social story procedures*. There should be a period of at least two weeks to determine if the social story is producing the desired behavior(s). If the story is not producing the desired results, then the social story must be altered. However, it is imperative that only

one variable of the social story be changed at a time. For example, if one sentence is changed in the story, the time of day that the story is being presented to the individual should not be changed.

10. *Plan for maintenance and generalization*. Once behavior change has been established, then the process of fading the social story can begin. This can be accomplished in several ways (e.g., increasing time between readings, placing more responsibility on the child to read the stories), but should assist in generalizing the content of the story across persons, settings, and situations.

Guidelines for writing social stories. Social stories need to be written with regard to the student's comprehension level (Gray & Garand, 1993), and should be comprised of sentences of four basic types: (a) descriptive, (b) directive, (c) perspective, and (d) control, with each serving a specific purpose (Fullerton et al., 1996; Gray, 1994, 1995; Gray, 1997, 1998). These types of sentences and their identified purpose are summarized in Table 3.

Table 3.
Social Story Sentences and Their Identified Purpose

Descriptive Sentences	
	Begins the Social Story.
	Objectively defines where a situation occurs.
	Identifies the salient features.
Directive Sentences	
	Individualized statements of desired behavior(s).
Perspective Sentences	
	Describes the reaction and feelings of others in the target situation.
Control Sentences	
	Aids in understanding abstract situations through use of nonhuman analogies.

Descriptive sentences are used to describe a setting and explain what occurs, who is involved, what they are doing and why (Gray, 1998). Gray and Garand (1993) indicate that descriptive sentences "paint the social backdrop of the targeted situation" (p.3). An example of a descriptive sentence would be "Some children ride to school on a bus." Such sentences immediately give information regarding the most relevant characters in a story and/or their role.

Directive sentences represent the desired social skill or behavior (Gray, 1998). Often, these sentences begin with phrase like "I can…" , "I will try…" or "I will work on…" (e.g., "I will try to sit quietly when someone is talking" , "I will try to stay calm if a friend wins a game."), and follow descriptive sentences. Collectively, these phrases provide a sequential list of expected responses to the targeted situation, as well as focus on what the student should do in order to be successful in that target situation (Gray, 1998; Gray & Garand, 1993). It is important that directive sentences be stated positively, and emphasize a statement that is intended to assist in learning and practicing new responses. Such a practice minimizes the pressure of a student to "get it right the first time" or comply exactly to be regarded as successful (Gray, 1998).

At times, social stories may contain perspective sentences. Perspective sentences describe the reactions and feelings of others in a given social situation (Gray, 1994, 1995, 1998; Gray & Garand, 1993), as wells as complete a social story by providing information regarding the impact of the social skill on one's self and others (e.g., My friends like it when I say hello to them in the morning.").

Control sentences are written by the student with autism spectrum disorders that enable the student to identify strategies the student may use to remember the information contained within the social story (Gray, 1994, 1998). Because these sentences are formulated by the individual, they contain information that reflects the interest of the individual. Therefore, it is imperative that such sentences are used as analogies utilizing nonhuman subjects (Swaggart, et al., 1995). For example, a student who has a interest in insects may write the following control sentence about people when changing their minds: "When someone says 'I changed my mind', I can think of an idea becoming better – like a caterpillar changing into a butterfly" (Gray, 1998, p. 179).

Social stories generally comprise of two to five sentences. Gray (1998) suggests using the *Social Story Ratio*, which defines the proportion of descriptive, directive, perspective, and control sentences appear in the entire social story. As a rule of thumb, it is customary for each social story to have two to five descriptive, perspective, or control sentences for every directive sentence in the story (Gray & Garand, 1993; Swaggart, et al., 1996). The essence is to describe more than direct.

Aside from sentence structure, social stories should contain one concept per page, and should be presented with the perspective of the student in mind. As Gray and Garand (1993) state, such a practice "emphasizes each point in a story and allows for variations to a basic social story" (p. 4). Variations to the story are essential to keep events as realistic as possible (Gray, 1994, 1995, 1997). For example, using the word *usually* is often more accurate than *always*. The need to portray possible variation is especially true if describing an event that calls for greeting someone at the door. Sometimes it may be a girl, and sometimes it may be a boy. Using this example, the developer would want to

show that the person could be someone different every time. Consideration of such flexibility, and more importantly, wording, is essential for the generalization of the skill that is the focus of the story.

Along the same lines, it is imperative that the developer of the social story does not present any misleading information to the individual regarding the content of the story. Children with autism spectrum disorders often make highly literal interpretations of statements (Kanner, 1943), regardless of the absurdity that may be apparent. Gray and Garand (1993) provided an excellent example. "Using the statement 'I will not talk in the library' in a story could be misleading. What if the child is asked something by his teacher? Stating the desired behavior, 'I will whisper in the library' or 'I can whisper in the library,' helps a student understand expectations" (p. 4). In the same way, the use of pictures must be considered carefully when creating a social storybook. Often, pictures can be distracting, but even more alarming is that children may make an inaccurate interpretation of the situation based on the illustration (Gray & Garand, 1993). For example, if an illustration depicts a boy shaking another boys hand on the playground, next to a swing set, on a sunny day, the student may interpret this to mean that you only shake a boys hand on the playground, next to a swing set, on a sunny day. It has been suggested that several photographs depicting variations of the same theme may be more effective (Gray, 1995; Gray & Garand, 1993).

The creation of a social story is not a science, but is more of an art (Gray, 1994, 1997). Due to the highly idiosyncratic nature of autism spectrum disorders, social stories must reflect the student's individual understanding and situation in order to be effective.

Creativity and strength-based story creation are essential to the proper implementation of a social story.

Guidelines for successful implementation of social stories. Gray and Garand (1993) indicate that there are three basic ways for implementing social stories. Selection of the most appropriate technique is highly dependent upon the individual abilities and needs of the target child (Gray & Garand, 1993). First, for a student who reads independently, an adult (e.g., caregiver, teacher, clinician) introduces the story by reading it to them twice. Gray and Garand (1993) suggest that the adult sit behind and to the side of the child. The adult then reads the social story to the child first, followed by the child reading it back. The adult may read the story with the child several more times in this manner, or until the child is acquainted with the story. At this point, the child reads the story once a day, independently.

The second manner in which a social story can be implemented is through audio equipment. Audio implementation is recommended for those individuals who cannot read (Gray & Garand, 1993). The story is first recorded on a cassette tape. The story is recorded onto the tape, as well as a beep that is used to indicate when the child is to turn the pages of the social story. Once the child is taught to use the cassette and to turn the pages when hearing the cue, the target child then should "read" the story no more than once a day (Gray & Garand, 1993).

A third approach to implementing social stories is through the use of videotaped social stories and video modeling (Charlop & Milstein, 1989). This approach is used either with students who can read independently or with those who need assistance (Gray & Garand, 1993). On the videotaped versions, the social story is read aloud on the

videotape with one page appearing on the screen at a time. Videotaped social stories make it possible for the story to be read by the target child (volume on) or for the student to read the story himself or herself (volume off) (Gray & Garand, 1993).

Regardless of the method that is used to implement any given social story, it is necessary for comprehension of the story to be checked. Gray and Garand (1993) recommend two ways in which this can be done: (a) the student completes a checklist or answers questions in writing at the end of the story, or (b) the student role plays demonstrating what he or she will do the next time the situation occurs. Once comprehension has been checked, it is suggested that an implementation schedule be created (Gray, 1994, 1998). Gray (1994) recommends using the *Social Story Implementation Plan*, which is used to indicate when instruction and reviewing will occur, as well as provides a record of the methods (i.e., story format, monitoring responses) and support materials (i.e., reminder sign, Social Calender) used for the story. A copy of this plan appears in Appendix E.

The most essential factor that needs to be considered when implementing a social story is monitoring of student progress on the new social skill being taught. Gray (1994) provides the *Social Story Report* (which appears in Appendix F), which keeps a running record of the student's progress and/or difficulties with the story. Understanding where a social story may be weak and needs to be improved is essential for the intervention to be successful. Therefore, such a form provides information regarding such events, as well as provides and efficient means of communication between the person implementing the social story and those directly involved with the target child.

Effectiveness of social stories. Unfortunately, a review of the available published research on both PsychINFO and ERIC databases regarding social story interventions for children with AS yielded no findings. However, six empirical studies were found relating to the effectiveness of social story interventions used with children with autism. Only three of these studies employed experimental control, and none referenced consideration of programming for generalization (e.g., natural contingencies, multiple environments) as suggested by Stokes and Baer (1977). Furthermore, none of these studies used methods to assess the social validity of the treatment. However, all of the studies that appear in this review demonstrate preliminary efficacy of social story interventions with a variety of children with autism spectrum disorders.

Swaggart, et al. (1995) used a social story intervention to teach appropriate social behavior to three children with autism. All participants attended a self-contained laboratory educational setting for children and youth with autism housed in a large university medical center. Each of the participants was included in this restrictive self-contained setting due to their intense aggressive behavior(s). Participants in this study fell within the spectrum of having moderate to severe autism. In addition, all participants manifested significant impairments in cognitive ability and expressive communication skills.

Interventions were based on a combination of social stories and the social-skill intervention model for children with autism advocated by Simpson and Regan (1988). This approach, described in Table 4, incorporated the use of reinforcers to be used to develop and maintain appropriate responses. Environmental and task analyses of the aggressive behaviors by the three participants revealed that the first participant's behavior

was related to an absence of appropriate greeting skills (i.e., verbalizing "Hi," waving, keeping hands to herself), while the other two participants demonstrated a deficit in sharing skills (i.e., giving a requested item to another student, parallel play).

Table 4.
Steps in the Social-Skills Training Model

1. Identify and define social deficits to be modified.
2. Identify and analyze related environments and situations.
3. Identify and analyze contingencies related to targeted behavior.
4. Accurately measure the deficit response and visually display its occurrence.
5. Conduct a task analysis of behavioral observations.
6. Select and apply appropriate reinforcers and training procedures to develop the desired response.
7. Carry out program maintenance and follow-up activities.

Following the identification of the targeted behaviors for the participants, social stories were developed. With the exception of one social story that was created for the first participant, the development of each social story followed the suggestions outlined by Gray and Garand (1993). Once the social stories were developed, the program's classroom teacher and paraprofessional, along with four graduate students working in the classroom, implemented the social story interventions with each of the three students. Each of the implementers had known the students for a minimum of two months prior to the study. The social stories were individually read to the target participants at the beginning of each day. Furthermore, verbal prompting was used by the staff members throughout the school day to reinforce the use of the skill outlined in the participant's respective social story.

Baseline data were collected for nine days prior to the implementation of the intervention program for the first participant. Data on 119-baseline greeting opportunities indicated that 7% were judged as appropriate (i.e., involved verbally saying "Hi"), 82% involved inappropriate touching (i.e., hugging), and 9% were overly aggressive (e.g., involved hitting, pushing, scratching). There were no occasions when this participant ignored others. Results of the combined social stories and social skills instruction intervention (which occurred for nine days) indicated a decrease in touching and aggressive behaviors. Specifically, 57% of the greeting behaviors were judged appropriate, while touching decreased to 26%, and no occasions of aggressive behavior occurred.

Baseline data collected for ten days for the second participant indicated the presence of aggressive behavior 30% of the time. In addition, data collected on sharing revealed that the participant did not share in 100% of the sessions, and screaming occurred during 100% of the sessions. Following a 18 day intervention phase, aggressive behavior was reduced to 6% of the sessions, sharing increased to 22% of the sessions, and screaming was reduced to 56% of the sessions.

Relative to the third participant, baseline data collected over 10 days indicated the presence of aggressive behavior in 20% of the sessions and grabbing another toy from a child during 100% of the sessions observed. Furthermore, the participant did not demonstrate any sharing behaviors during the sessions observed (absence of sharing 100%). Intervention phase lasted 17 days, and postintervention observations revealed a complete decrease in aggressive behavior and a 35% reduction in grabbing toys from another child.

The case studies explained here provide some support for the use of social stories with children with autism, but should be considered with caution. Specifically, this study demonstrates support for the utility of social stories in reducing the inappropriate social behaviors demonstrated by the participants, while increasing the frequency of more socially appropriate behavior. However, the study did not employ any means of experimental control. In addition, the sample size limits the generalizability. Furthermore, there was no measure utilized to assess the impact of the treatment on teachers' or parents' perspectives of the behavior of the participants (social validity). Perhaps the most problematic issue is that Swaggart et al. (1995) combined the use of social stories with a more traditional behavioral social skills training program and never controlled for the effects of either. Therefore, it is not possible to determine the effects of the social stories alone.

Kuttler, Myles, and Carlson (1998) used a social story intervention to reduce tantrum behavior in an individual with autism. The participant was a 12-year-old boy diagnosed with autism, Fragile X, and intermittent explosive disorder with moderate cognitive impairment and severe expressive language deficits (i.e., only using one- and two-word utterances). The participant's tantrum behavior was observed and analyzed to see what factors may be contributing to the maintenance of the behavior. Tantrum behaviors were operationally defined as screaming, making inappropriate vocalizations, and dropping to the floor and thrashing. Environmental and task analysis indicated that the tantrum behavior occurred most frequently during transitions, wait time, and free periods. Subsequent social stories were designed to reflect these concerns.

Two social stories were created for the participant. Both stories were based on the two most difficult periods of the school day for the participant: (a) lunchtime and (b) independent work time. Each story identified these difficult situations through descriptive sentences, described the target/replacement behavior (e.g., waiting appropriately, moving from one task to another), and indicated the reinforcement earned for engaging in the desired behavior. In addition, each social story was designed using picture icons to accommodate for the receptive communication deficits of the participant.

Using an ABAB plus alternating treatments experimental design, observational data were collected on the frequency of the participant's tantrum behaviors both during treatment and in the absence of the intervention. Initial baseline observations collected over a 5-day period indicated that tantrum behaviors occurred, on average, 15.6 times per day during the morning work time. During lunchtime, the mean frequency of tantrum behavior was 11.6 times per day. During the first treatment phase, tantrum behaviors occurring during morning work time reduced to 0 times per day, and 2.0 times per day during lunchtime. When the return to baseline condition was presented, tantrum behaviors increased to an average of 15.33 times per day during morning work time, and 18 times per day during lunchtime. During the second treatment phase, tantrum behavior again reduced for morning work time and lunchtime, 0 and 1.0 times per day respectively.

Clearly, these findings suggest that implementation of the social stories were effective in reducing the frequency of tantrum behaviors of the participant. This study also provides a measure of control through its use of an alternating treatment-baseline design. However, a return to baseline frequency of tantrums upon removal of the

intervention suggests a possible threat to internal validity. Due to the teaching nature of the social story intervention gains in target behaviors should be maintained following discontinuation of treatment. As with the Swaggart el al. (1995) study, the generalizability of these results are limited both by its single subject design and failure to include any social validity measures regarding the impact of the intervention.

Hagiwara and Myles (1999) investigated the effects of computer-based social stories for three elementary-aged boys with autism. Functional assessments were used prior to the development of any social story to identify target behaviors for each participant. For the first two participants, completion of washing hands was chosen as the target behavior. The target behavior identified for the third participant related to average duration of time spent on-task (e.g., reading aloud, writing, answering questions). Computer-based social stories were designed as educative approaches for the identified behavior of each participant. Each participant was able to operate the social story program once a day immediately prior to entering a specified setting. Effectiveness of these social stories was assessed using a multiple-baseline across settings design for each participant. Specifically, hand washing behaviors for participant I were examined before snack, prior to lunch, and after recess. Likewise, hand washing behaviors for participant II were examined before going to resource room, before lunch, and after recess. Settings for participant III included lunch, resource room, and a general education classroom.

Results of social story implementation revealed only minor improvements in targeted behaviors. Participant I's hand-washing behavior increased 17% during morning snack, 8% before lunch, and 9% after recess respectively. Data for participant II revealed similar patterns (8% increase before resource, 9% increase before lunch, and 8% increase

after recess respectively). The average duration of participant III's on-task behavior across lunch, resource room, and general education classroom settings did not demonstrate any consistent effects of the social story intervention.

While the results of this study demonstrated limited support for the effectiveness of social story interventions the results need to be considered cautiously. First, in relation to the first two participants, increases in hand washing behaviors across settings were not dramatic. In fact, baseline levels of completing hand washing averaged around 80%, and already high ceiling for any behavior, especially the percentage of times young children complete this behavior. Second, data were only collected for a period of 16 days due to restrictions beyond the control of the investigators. These factors alone significantly impact the interpretation of the findings. However, the delivery method of the social stories (computer-based) was unique and represents an area for continued research in the future.

Norris and Dattilo (1999) examined the relationship between a social story intervention and the inappropriate social interactions of a girl with autism who attended an inclusive second-grade classroom. The participant was an 8-year-old African-American girl diagnosed with mild to moderate autism with severe deficits in receptive and expressive language skills. The participant functioned in the average range of general mental abilities with strengths in reading recognition, spelling, and daily living skills. Inappropriate social interactions (e.g., singing or talking to herself) occurred frequently during lunchtime, and were the focus of the social stories.

Three different social stories addressing the participant's social interactions during lunchtime were created according to Gray's (1994, 1998) recommendations. One

of the three stories was read each day, immediately prior (10-15 minutes) to lunch ("priming" strategy), with the participant while she read the story aloud. A video camera, with an attached microphone, was then used to record 8 to 10 minutes of each lunch period. Videotaping occurred prior to the study to increase the participant's exposure to being videotaped. This videotaping process allowed for monitoring of targeted inappropriate and appropriate social interactions, as well as the absence of social interactions, during baseline and intervention conditions of the study.

Dependent measures in this study included the participant's estimated frequency of (a) appropriate social interactions (i.e., initiating or responding to other students verbally or gesturally); (b) inappropriate social interactions (i.e., verbalizations with bizarre content, making noises); and (c) absence of social interactions (i.e., no verbal, physical, or gestural initiations). Videotapes were observed by the classroom teacher and a graduate student. Prior to the study, these observers received training on sample tapes until they reached 80% agreement. During baseline and intervention conditions, interobserver reliability checks occurred during 20% and 25% of the sessions respectively. Occurrence reliability was calculated on all three types of interactions and ranged from 89% to 100%.

Using an A-B design, data were collected on the frequency of the participant's social interactions during lunchtime. During the initial 5-day baseline condition, the mean level of inappropriate social interactions was 34%. Level stability indicated that only 40% of the data points fell within 20% of the mean. However, the trend data of the last 3 data points was countertherapeutic, and the intervention was initiated. During the treatment condition, there was no immediate change in either the level or the trend of

inappropriate social interactions. Data were variable and appeared to be moving in a contratherapeutic direction. However, on the fifth day of the intervention, inappropriate social interactions began decreasing and continued to move in a decelerating trend for the remainder of the intervention (one exception point). Visual analysis of the data indicated that the mean level of inappropriate social interactions was reduced by 48% between the first (44%) and the last (23%) data points. Unfortunately, the level of appropriate social interactions did not show a clinically significant change (occurring 6% of the time during baseline, and 4% of the time during the treatment condition).

It appeared that the social story intervention had an effect on the participant's social interactions during lunchtime. However, these results must be considered with caution for several reasons. First, due to the lack of experimental control associated with an AB design, there was no replication of the effect of the intervention. Therefore, only a correlational relationship can be inferred. Second, three social stories were used to address one behavior using varying content. Because numerous ideas were introduced in the stories, the participant's ability to focus on any one or two key points may have been jeopardized, resulting in possible confusion of what desired behaviors should have been practiced during lunchtime. These factors, combined with the qausi-experimental design utilized in the study, subject threats to both the internal and external validity of the study and, therefore, should be interpreted with caution.

Theimann and Goldstein (2001) used a series of social stories and video feedback to increase the social communication skills of five children with autism. Each of the target children were paired with two normal developing peers as a source for comparison. These triads met twice a week for 30 minutes during each session. Each of the treatment

sessions were broken down into three segments: (a) a 10-minute social story instructional period, (b) followed by a 10-minute observation of social interactions, (c) and a 10-minute video feedback session. All of these sessions were audio and video recorded. These data were coded to measure increases in four primary dependent social measures: (a) securing attention, (b) initiating comments, (c) initiating requests, and (d) contingent responses. Using a multiple baseline across behaviors, data were collected on the estimated frequency for each of the dependent social measures. These data were examined across the five students during the10-minute social interaction. Inter-rater reliability was sufficient with a range across subjects between 85% and 100%. This reliability occurred during 30% of all experimental sessions.

Results of this study demonstrated increases in the social communication skills for all five participants. During intervention phases, each of the participants' mean level of the four dependent measures increased. Overall, these findings support the use of social stories to increase the social development of children with ASD. However, theses results must be viewed cautiously for two reasons. First, this study employed multiple treatments (e.g., social stories, script-fading, self-evaluation) without examining the effects of each of these factors separately. Perhaps, results may have been better attained using a changing criterion design. Second, the observation period of 10 minutes appears to be relatively brief given the social deficits of children with ASD. Longer observation intervals may have been more salient. Taken together, these limitations should not discriminate against the outcome data of the study. Specifically, this research did demonstrate the benefits of using visuals supports within embedded text as an educative approach for children with autism.

Lorimer, Simpson, Myles, and Ganz (2002) examined the efficacy of a social story intervention implemented in a home setting to decrease the precursors to tantrum behaviors in a child with autism. The participant was a 5-year-old boy diagnosed with mild to moderate autism. The participant was estimated to function in the average to above-average range of cognitive abilities with strengths in his ability to communicate orally. Behavior problems in the home included tantrum behaviors characterized by screaming, hitting, kicking, and throwing objects. A functional assessment of these behaviors revealed that they were motivated by attention and attempts to gain a tangible reinforcer. The participant attempted to verbally express his wants and needs before displaying the challenging behaviors. However, the manner of communication the participant utilized was ineffective, characterized by shrill, loud, and perseverative commands (e.g., "Listen to me!" and "Stop talking"). These precursors to the tantrum behaviors were described as interrupting vocalizations, and if they were ignored or reprimanded, the participant escalated to tantrum and aggressive behaviors. The parents of the participant reported that the tantrums occurred at least five times per day, and lasted from 45-minutes to 1-½ hours.

Two social stories were created for the participant. Both stories were based on the hypothesis that reducing ineffective and inappropriate verbalizations would decrease the frequency of tantrums. Accordingly, the social stories addressed the participants (a) need for appropriately gaining attention from others who are talking and (b) waiting for the appropriate time to talk or ask for something. Each story identified these difficult situations through descriptive sentences, described the target/replacement behavior (e.g., waiting appropriately, not yelling or hitting), and indicated the reinforcement earned for

engaging in the desired behavior. In addition, each social story was designed using picture icons to accommodate for communication deficits of the participant.

Dependent measures in this study included the participant's frequency of tantrum behaviors and frequency of interrupting vocalizations. Data were collected in the home by the participant's parents, as well as during 45-minute home therapy sessions. The researchers made reliability checks during 33% of the observations. Prior to the study, these observers received training on how to identify and measure the two target behaviors. Average interobserver reliability was 96.10% throughout the intervention.

Using an ABAB plus alternating treatments experimental design, observational data were collected on the frequency of the participant's tantrum behaviors both during treatment and in the absence of the intervention. Initial baseline observations collected over a 7-day period indicated that tantrum behaviors occurred on 5 of the 7 days. During the first treatment phase, the participant exhibited no tantrum behaviors on 6 of the 7 days. When the return to baseline condition was presented, the participant had tantrums on 2 out of 3 days. During the second treatment phase, tantrum behavior again reduced. On 6 of 7 days, the participant exhibited no tantrums.

Changes also were observed in the participant's precursor behaviors. These behaviors occurred several times a day during the initial baseline period, but began to decrease when the social stories were introduced. Similar to the pattern observed in the participant's tantrum behaviors, precursor behaviors dramatically increased during the second baseline period, when the participant did not have access to the social story. When the intervention was reintroduced, the participant's precursor behaviors demonstrated a downward trend.

These findings suggest that implementation of the social stories were effective in reducing the frequency of tantrum behaviors of the participant. This study also provides a measure of control through its use of an alternating treatment-baseline design. However, a return to baseline frequency of tantrums upon removal of the intervention suggests a possible threat to internal validity. Due to the teaching nature of the social story intervention gains in target behaviors should be maintained following discontinuation of treatment. As with the studies previously described, the generalizability of these results are limited both by its single subject design and failure to include any social validity measures regarding the impact of the intervention.

Summary

A fundamental component of AS is having difficulty in social integration, yet researchers have only just begun to describe the nature of the characteristic difficulties, let alone develop remedial programs to encourage greater competence in this area (Atwood, 2000). Clearly, there is an increasing demand for the development of intervention programs for children with AS due to the increase of the practice of mainstreaming in schools. However, little research has been conducted to develop such strategies.

It appears that although quite similar, individuals with AS appear to be more socially interested than their autistic counterparts. Their interest in maintaining friendships, having girlfriends/boyfriends, and social contact may be quite striking (Volkmar & Klin, 2000), and is apparent through the years of schooling (Baur, 1996; Church, Alisanski, & Amanullah, 2000). Unfortunately, due to their repeated exposure to ridicule and torment for their “odd” and “eccentric” behaviors, many individuals with AS

eventually withdraw and set aside their desire for friendship. Such experiences are one of the major contributors to a secondary diagnosis of mood disorders, most notably depression. However, motivation to acquire social relationships may be a powerful resource for interventionists who seek to improve the social competency of children with AS. Although many techniques apply to the treatment of individuals with autism, resulting effects tend to be more limited because of the more withdrawn and disinterested nature of the presentation of individuals with autism (Volkmar & Klin, 2000).

The presence of language and elevated cognitive skills seen in children with AS can be effectively used to foster their social skill development. This allows for the future development of interventions to be more rigorous in design, but addresses the area of deficit more directly. Through the use of social stories, children with AS can socialize and model appropriate behavior(s), increasing their interactions with others and beginning to actively seek social relationships. Social stories have been reported to be an effective means of modifying the behavior of individuals with autism, such as how to greet people appropriately and how to share toys (Swaggart, et al., 1995), how to monitor volume when singing with others (Fullerton, et al., 1996), how to reduce tantrum behavior (Kuttler, Myles, & Carlson, 1998; Lorimer, Simpson, Myles, & Ganz, 2002) and how to act appropriately during lunchtime (Norris & Dattilo, 1999). Unfortunately, all of these studied have emphasized the use of social stories on individuals with autism (and other comorbidities, see Kuttler, Myles, & Carlson, 1998) with concurrent deficits in language processes necessary for understanding social stories. Therefore, the use of social stories with individuals with AS, who express no deficits in language abilities may have an even greater impact when systematically controlled.

With the increased use of the practice of mainstreaming, and with the prevalence of AS being forseeably higher than that of autism, it is necessary to begin researching approaches to help children with AS develop greater social interaction skills. Throughout history, children who were perceived as just being "different" or "weird," have confused and bewildered clinicians, parents, and, more importantly, educators. Generally, the outcomes have been poor, with improper placements and misunderstood reasons for the behaviors seen in children with AS. With greater awareness of how AS may differ from autism comes greater knowledge in developing appropriate strategies of intervention. Thus far, the social story paradigm appears to hold promise as a logical and beneficial intervention to diminish the qualitative differences that make children with AS so conspicuous. However, research on social skills interventions with children with AS is scant, and research on social stories with children with AS currently is nonexistent

Purpose of the Study

The purpose of the current study was to examine the effectiveness of social story interventions for children with AS. This study expands the current body of research in this area by: (a) employing a means of experimental control; (b) probing for generalization through a follow-up phase; (c) incorporating indices of treatment efficacy; and (d) examining the social validity of the intervention

Chapter III

Research Methods

Overview

This chapter provides an outline of the method used to conduct the study. Specific descriptions of the participants, instruments, treatment protocol, and data analysis procedures are outlined below.

Subjects

The participants for this study were selected from the Child Development Center (CDC) located at St. Joseph's Children's Hospital in Tampa, Florida. Prior to participating in this study, a sample pool of five children who were not currently receiving any kind of social skill treatment were targeted for participation. This sample pool was based on those individuals who had previously received social skills training at the CDC. To be included in this sample pool, potential participants were not to have received social skills training from staff at the CDC for a period of at least one year. Information about these potential participants was gathered through clinical chart reviews and discussions with the lead clinician at the CDC. Information including the level of the child's social skill development and cognitive and verbal abilities, as well as parent involvement was used to narrow the sample pool to three children. Once these three children were identified, their parents were contacted and briefed about the study by the director of psychological services at the Child Development Center. If the parents

expressed interest in this study, the primary investigator contacted them to provide more details of the study and answer any questions.

Three elementary-age participants were selected based on multiple inclusionary criteria. The three target participants were boys ranging in age from 9 years 9 months to 11 years 6 months (X = 10 years 5 months). For inclusion in this study, the participants (a) had a current diagnosis of Asperger's according to DSM-IV, with current cognitive functioning levels in the average to above-average range, (b) possessed the ability to communicate orally with others, and (c) demonstrated evidence of a potential benefit for the intervention program as indicated by a clinician, teacher, related support staff, or parent report. Prior to final inclusion in this study, acquisition of parental permission for participation and child assent was warranted. The decision of who to include in this study was based on the notion that "social stories are most likely to benefit students functioning intellectually in the trainable mentally impaired range or higher who possess basic language skills" (Gray & Garand, 1993; p. 2).

Darius

Darius (age 10 years 1 month) attended fourth grade in a fully integrated private school. Information gathered through functional assessments revealed that Darius is a very compassionate child who enjoys playing video games, soccer, and football. Across all academic domains, Darius demonstrated above average performance with no academic concerns. His teachers described Darius as a good reader and gifted in math. Aside from these strengths, Darius was described as having difficulty in group situations. Specifically, both parents and teachers stated that Darius becomes extremely oppositional and negative when playing games (e.g., calls other child names, yells at teammates).

Such behaviors were viewed as socially immature and would not be conducive to maintaining friendships at school. Direct observations conducted on the playground verified this information, and a social story to reflect this weakness was created (Appendix G).

Francis

Francis (age 11 years 6 months) attended the fourth grade in a private Catholic Diocesan school dedicated to meeting the needs of students with learning disabilities. Both the parents and teacher described Francis as a sweet and sensitive boy with great creativity. Specifically, Francis enjoyed art, writing stories, and creating adventure games. Aside from his many talents, Francis was at times socially immature and often said (e.g., inappropriate jokes) or did things (e.g., walk away from a conversation) that offended others at school. Observations conducted at Francis's school revealed difficulty with joining in activities. Specifically, Francis was observed to want to join in with many other children on the playground, but he would often ask to play then walk away. In addition, his eye contact was highly infrequent and he did not abide to the "hidden" rules of being aware of another person's body space. A subsequent social story was designed to reflect these difficulties (Appendix H).

Angelo

Angelo (age 9 years 9 months) attended the fourth grade in an integrated private school. Both his family and teachers described Angelo as a very scientific child who enjoyed experimenting. In particular, Angelo was spending a great deal of time developing a juice modeled after ancient Egyptians. Other interests included soccer, video games, and various cartoon characters (e.g., Spider Man, Sponge Bob Square

Pants). Main areas of difficulty for Angelo appeared to be spontaneously joining in activities. His parents stated that it takes a great deal of effort to get Angelo to join in any activity with other children and they often resort to making deals with him. Angelo's teacher verified this information, stating that Angelo spends most of his time during recess alone. Both the parents and the teacher felt that Angelo would benefit from an intervention that focused on how to politely ask to join in an already existing game or conversation. Observations conducted during recess at Angelo's school verified the information gathered from Angelo's family and teacher. Angelo's social story focused on ways to join in activities and the benefits of making friends associated with joining in (Appendix I).

Settings

Observations of the three participants were conducted at each of the participants' schools during regular school hours. The primary setting in which these observations occurred was directly related to the identified behaviors targeted for the social story interventions. For example, instances of joining in play activities or conversations with other children were observed on the school playground. Respect for all of the school personnel was regarded and the primary investigator discussed the procedures with those involved prior to any observations.

For Darius the environmental setting was a fenced in area on the side of the school where there were several "jungle gyms" and an area to play an active sport (e.g., football). Around this area were sidewalks and breezeways were children could sit and play games or engage in conversation. During recess time, there were multiple grades on

the playground at once. Typical behaviors included a variety of playing sports, climbing on the swing sets, and engaging in conversation under the breezeways.

For Francis, the environmental setting was a courtyard in the middle of the school where there were several picnic tables. Around this area was a sidewalk with an overhang roof. This area was used during the morning hours for recess/snack time. During this time, there were multiple classrooms in the courtyard (first through sixth grade). Typical behaviors during the recess/snack time included walking around the courtyard engaging in conversation, eating the morning snack, or playing tag.

For Angelo, the environmental setting was a large fenced in soccer field behind the school. This area also had a swing/slide set that the children were permitted to play on. Recess time occurred immediately following lunch and it was only Angelo's classmates and one other fourth grade class. During this time, the children were permitted to play soccer, play on the swing/slide set, or walk around and talk. Typical behaviors included playing soccer. In fact, most of the children played soccer each day during recess. Angelo's class would often pick teams in the morning prior to going to recess.

Materials and Measures

Social story book

Three social stories were designed addressing an identified target behavior for each participant. Each social story book was designed according to the criteria used by Norris and Dattilo (1999). These social stories were individualized print books that the students could carry to and from school and use in multiple settings (e.g., library, cafeteria, playground). Each book was constructed on 6 inch (width) by 8 inch (length)

pieces of paper. Including the cover page, there were be five to nine pages in each story that was laminated and fastened together along the left margin. The cover page of each social story contained only the title, which was placed ½ inch from the bottom of the page and typed in 14-point Times New Roman font. The remaining pages contained one or two sentences typed in 14-point Times New Roman font and printed near the bottom of each page. There were ½ inch margins on three sides of each page (the margin on the bottom of the page was set at 0 to allow for appropriate room for the sentences). This spacing left approximately a 5" x 7" area above the sentences where color 1 ½" x 1 ½" Mayer-Johnson picture symbols were placed (Mayer-Johnson, 1994).

The Mayer-Johnson symbol library is a nationally accepted and fundamental component of educational programming for children with communication disorders across the United States of America. The system, available in either hard copy or through computer database (Board Maker Applications, 1989), provides visual symbols for a variety of types of words (e.g., nouns, verbs, adjectives) in the English language. Mayer-Johnson symbols were used to emphasize and communicate the message of each social story. Although children with AS possess average language skills, the Mayer-Johnson symbols were used to make each social story more appealing for the reader.

Observational data forms

Two separate observational data forms (i.e., frequency of joining in, percentage of appropriate social interaction skills) were used to gather data to test hypotheses. Both forms were developed by the primary investigator and were modified based on expert opinion and sample (pilot) observations.

Social Interaction Recording System (SIRS). Data on the frequency of identified target behaviors were gathered using a partial interval recording procedure to measure estimated frequency (i.e., number of intervals of occurrence) and percentage of intervals of active and passive occurrence of the targeted social engagement behavior (i.e., joining in, initiating a conversation). A sample of the SIRS is provided in Appendix J. The SIRS provides for 100-observational sequences, each of which are divided into a 10-second observation and a 5-second recording period, resulting in a total documentation period of 20-minutes per form.

Observers using the SIRS first observed for a 10-second interval. The observers then had 5-seconds to record the behavior that the target child was engaged in at the conclusion of the 10-second interval. The observers recorded the target child's behavior as active, passive, or absent. The number of total intervals in which each type of behavior occurred was summed for the entire observation period. This number was then be divided by the total number of observation intervals (50-100), generating a percentage of intervals in which the target child or peer comparison was actively or passively socially engaged. The percentage of intervals calculated provides an estimate of the frequency of social engagement.

Observation of Appropriate Social Interaction Skills (OASIS). Additional observational data were collected by observers using the OASIS. The OASIS is a simple 15-item checklist that the observer used to gather data for each participant relative to the frequency of desired social interaction skills (e.g., eye contact, body basics, conversational skills). A copy of this checklist is provided in Appendix K. The form was completed by placing a check or tally mark in the appropriate column when one of the

stated behaviors occurred. Totals and ratios of yes/no responses were calculated during each observation to demonstrate any change in frequency for each participant's use of appropriate social interaction skills. This checklist also had space to document the student's name, where the child goes to school, the student's gender, and the date of the data collection.

Pre, Post-Test Measures

Social Skills Rating System—Parent Form, Elementary Level (SSRS-PE; Gresham & Elliott, 1990). The SSRS-PE is a 55-item social skills rating scale that measures two domains of social competence: (a) social skills and (b) problem behaviors for children between Kindergarten and sixth grades. The Social Skills Scale is comprised of five subscales: (a) cooperation; (b) assertion; (c) responsibility; (d) empathy; and (e) self-control. Items are rated first on how often the behavior occurs (ranging from 0 = "never" to 3 = "very often"). Items are then rated as to how important these behaviors are to the rater (ranging from 0 = "not important" to 3 = "critical"). The Problem Behavior scale contains three subscales: (a) externalizing problems, (b) internalizing problems, and (c) hyperactivity.

Reliability and validity of the SSRS-PE indicates adequate to excellent psychometric properties when used for individual educational and home interventions with students suspected of having significant social behavior problems. Across all forms and levels, the median coefficient alpha reliability for the Social Skills Scale was .90, while it was.84 for the Problem Behaviors Scale. The subscale internal consistency estimates for the parent-elementary form ranged from .65 to .87 for Social Skills and from .71 to .87 for Problem Behaviors. Due to the small number of items on each

subscale (typically 6 to 10 items), the internal consistency coefficients may have been compromised. Test-retest reliability of the SSRS-PE demonstrated high stability over a 4-week period with 45 subjects. Parent correlations were .87 for Social Skills and .65 for Problem Behaviors. Social Skills subscale reliability coefficients ranged from .77 to .84, while the Problem Behaviors subscale reliabilities ranged from .48 to .72.

The SSRS-PE was administered with the Child Behavior Checklist-Parent Report Form (CBCL-PRF) to a sample of 45 elementary-aged children drawn for the standardization sample. The Problem Behaviors scale on the SSRS-PE correlates .70 with the corresponding scale on the CBCL-PRF. However, the Social Skills scale on the SSRS-PE correlates .58 with the corresponding scale (Social Competence) on the CBCL-PRF. However, this lower estimate is likely when considering the relative distinctiveness and ease when observing disruptive behaviors in children as opposed to observing less distinctive internalizing behaviors.

For purposes of this study, the SSRS-PE served as a broad measure to assess any change in behaviors that parents could record. Because this study dealt with higher-functioning children, it was hypothesized that they may already possess some appropriate social skills. However, the degree to which the participants used these skills was unknown. The SSRS-PE was used as a measure to examine if the intervention has any effect on other social skills beyond those identified target behaviors.

Social Skills Rating System—Teacher Form, Elementary Level (SSRS-TE; Gresham & Elliott, 1990). The SSRS-TE is a 57-item social skills rating scale that measures three domains of social competence: (a) social skills, (b) problem behaviors and (c) academic competence for children between for Kindergarten and sixth grades. The

Social Skills Scale and the Problem Behavior scale are identical to those described in the SSRS-PE. The Academic Competence domain is unique to the teacher form and is concerned with the student's academic functioning. The Academic Competence Scale consists of 9-items on a five-point Likert scale that corresponds to percentage clusters (i.e., 1 = "lowest 10%," 5 = "highest 10%").

Reliability and validity of the SSRS-TE also indicates adequate to excellent psychometric properties when used for individual educational decisions with students suspected of having significant social behavior problems. The subscale internal consistency estimates for the teacher-elementary form ranged from .86 to .94 for Social Skills, from .78 to .88 for Problem Behaviors, and .95 for Academic Competence. Test-retest reliability of the SSRS-TE demonstrated high stability over a 4-week period with 288 subjects. Teacher correlations were .85 for Social Skills, .84 for Problem Behaviors, and .93 for Academic Competence. Social Skills subscale reliability coefficients ranged from .75 to .88, while the Problem Behaviors subscale reliabilities ranged from .76 to .84. The Academic Competence Scale demonstrated test-retest reliability of .93.

The SSRS-TE was administered with the Child Behavior Checklist-Teacher Report Form (CBCL-TRF) to a sample of 99 elementary-aged children drawn for the standardization sample. The SSRS-TE and the CBCL-TRF externalizing scores were highly correlated (r = .75), as were the SSRS-TE Problem Behaviors Total score and the CBCL-TRF Total score (r = .81). Internalizing scores on both measures correlated .59 with each other. However, the hyperactivity scales of both measures demonstrated a high correlation (r = .77).

Like the SSRS-PE, the SSRS-TE was used as a broad measure of prosocial development from the teachers' perspective. The SSRS-TE was used as a measure to examine if the intervention had any additional effects on the development of participants' prosocial behaviors in both classroom and school settings.

*Children's Atypical Development Scale (CADS; Guevremont & Dinklage,*see *Barkley, 1990).* The CADS is a 53-item rating scale designed to measure four areas of unusual behaviors in clinic-referred children from ages 4 to 16. The domains rated include: (a) Communication Deficits, (b) Lability, (c) Social Relatedness Deficits, and (d) Preoccupation. Items are rated as to how relevant these behaviors are to the rater (ranging from 0 = "not true" to 2 = "very true of often true"). The CADS is a useful instrument for distinguishing atypical behaviors associated with PDD, and has been recommended for use as both a screening and a pre- and post-intervention measure.

Although this scale was never standardized, it appears to be well constructed and has been demonstrated in a pilot study to be a useful scale as a means of assessing clinically significant symptoms of affective disorders in clinic-referred children. The item content of the CADS was generated by four experienced clinicians who compiled an extensive list of unusual behaviors based on Cohen, Paul, and Volkmar's (1986) classification criteria for PDDs and the medical records of 40 children diagnosed with PDDs. A pilot study was conducted with parents of 23 children clinically diagnosed with PDD, and 20 children with ADHD. Both groups had normal intelligence and were referred to the same medical center. Two groups of students with learning disabilities (LD) served as a control. Parents were asked to rate each item on a 3-point scale. Results of this pilot study indicated that items were most characteristic of the PDD group,

endorsed to a lesser extent by parents of ADHD children, and rarely reported for the LD and typical control groups (Barkley, 1990).

More recently, the psychometric properties and factor structure of the CADS were assessed. Reliability and validity of the CADS indicates adequate to excellent psychometric properties when used with clinic-referred children. The Communication, Lability, and Social Relatedness domains demonstrate internal consistency with alphas ranging from .80 to .87. However, the Preoccupation domain does not show high internal consistency (Cronbach's alpha of .53). It is important to note that this domain only consists of two items which may compromise the alpha level. Estimates of internal consistency corrected for the scale length using the Spearman-Brown formula resulted in a corrected Cronbach's alpha of .82 for the Preoccupation domain.

Concurrent validity of the CADS was assessed with standardized parent ratings. Parents of the children were asked to complete the CBCL and the Conners Parent Rating Scale (CPRS). CADS scores correlated significantly with the parent report measures including virtually all the subscales on the CPRS (ranging from .22 to .57), as well as on both the Internalizing (correlations ranging from .38 to .50) and Externalizing (correlations ranging from .21 to .63) scales of the CBCL.

Although a number of rating scales and questionnaires are available which assess behaviors associated with autism (e.g., Child Autism Rating Scale—CARS; Schopler, Reichler, & Renner, 1988), these scales may be less applicable for higher-functioning children. In addition, most of these scales do not adequately sample odd or unusual behaviors commonly seen in higher-functioning children with autism spectrum disorders. The CADS is a scale that appears to be particularly applicable to sample unusual

behaviors observed in higher-functioning children with autism spectrum disorders and, in this study, served as a pre- and post-intervention measure for both parents and teachers.

Social Story Journal

Due to the highly individualized nature of social stories implementation, a journal was kept by both the participating children and their parents. This journal allowed the primary investigator to assess if the social story had been implemented according to the recommendations of Gray (1994) and Gray and Garand (1993). This form was used to keep a running record of the participants' progress and/or any difficulties with the story. Specifically, each journal entry assessed where and with whom the social story was read and the child's reaction to the social story (see Appendix L). Such information provided a level of treatment integrity for the social story intervention.

Dependent Measures

The primary behaviors that were identified for each participant related to social engagement (e.g., sportsmanship, joining in). Specific target behaviors were identified through functional assessments with each target child. First, interviews with parents and teachers were conducted. The focus of these interviews related to areas of concern or weakness for each child, as well as information on the relative frequency of the behaviors. Once a specific behavior was identified for each participant, detailed information regarding those behaviors was gathered prior to the study through observations of the situations in which the behaviors were likely to occur and interviews with relevant individuals (e.g., parent(s), teacher(s)). Information collected included relevant cues of the behavior, the typical sequence of events that occurs prior to and after the behavior, and descriptions of the behavior gathered from those involved in the

situation. This information was essential to understanding what would be important to include in the social stories, as well as what information was irrelevant.

Dependent measures included the estimated frequency (i.e., percentage of intervals) of active and passive target behaviors for each individual, as well as the absence of the identified target behavior. Specifically, the dependent measures for this study were joining in (Francis and Angelo) and sportsmanship (Darius).

Joining in

Active Joining In (AJI). AJI was defined as instances in which the target child was contributing to a reciprocal conversation or is actively participating in some play activity with one or more children (see Appendix M). Examples of AJI were defined as children playing next to each other and using a variety of social exchanges to show their recognition of peers, such as talking to a peer about a game that is being played on the playground. During AJI, the child was observed borrowing or lending toys, using each other's toys, or sharing accomplishments (e.g., successfully building a tower with blocks). AJI also included any type of organized group game (e.g., tag, hide-and-seek) that involved taking turns and sharing identification with the group. AJI did not include any sort of aggressive act such as cursing, shouting, pushing, name calling, hitting, and making forceful bodily contact with someone else during a play activity.

Passive Joining In (PJI). PJI was defined as instances in which the target child was playing next to peers, using the same toys or engaged in the same activity, but playing independently of those peers (similar to parallel play). This also included times when students were engaging in conversation, rather than play. Examples of PJI included listening to a group of peers while sitting among them, or watching a group of peers

playing a game and following the group format alone. PJI did not include aimlessly walking around a peer group talking to himself or herself, silently reading while peers were actively playing around the target child, or the target child not sharing any of the toys with those around him/her.

Absence of Joining In (AbJI). AbJI was defined as instances in which the target child did not display any verbal, physical, or gestural initiations or responses to peers. AbJI included the target child engaged in a game or other activity by himself, not responding to his or her name being called by another peer, refusing to share toys on the playground, and any other behaviors that were observed as ignoring peers and/or adults. The child was not involved with other children and appeared distant from activities occurring around the participant. Any occurrence of fighting, name calling, and making forceful bodily contact with someone else during a play activity was labeled as AbJI. In addition, data regarding the qualitative aspects of such negative behaviors was monitored.

Sportsmanship

Active Sportsmanship (ASP). ASP was defined as instances in which the target child actively treated teammates, opponents, and/or coaches with respect (see Appendix N). Active displays of sportsmanship demonstrated an awareness of encouraging group play through verbal, physical, or gestural means. ASP included instances when the target child offered positive encouragement during a play activity to other children on the playground (e.g., saying "good job," "way to go," "awesome," "good luck," "maybe next time," "good effort"). In addition, ASP included times when the target child cheered for opponents or own team members after a good play or score (e.g., clapping when a team

scores, telling the other team "good play"). ASP did not include any behaviors such as yelling at teammates or other players during the game.

Passive Sportsmanship (PSP). PSP was defined as instances in which the target child attended to the parameters of a game/activity with a full commitment to participatory cohesion. Passive displays of sportsmanship demonstrated aspects of fairness and playing in an appropriate manner. For example, following and/or playing within the rules of the game (e.g., not cheating, not intentionally hurting an opponent or other team member) and accepting the loss of the game without making negative comments to self or others would be examples of PSP. PSP would not include any acts of verbal or physical aggression, nor any instances in which the child made excuses for the game progressing poorly.

Absence of Sportsmanship (AbSP). AbSP was defined as instances in which the target child did not display any verbal, physical, or gestural sportsmanship initiations or responses to peers nor display equality and fairness in his play. AbSP included any negative comments or sarcastic remarks to opponents or own team members (e.g., complaining about team members' performance, talking down to other players, laughing when someone gets hurt) or any aggressive actions towards opponents or own team members (e.g., running after opponent who just scored, throwing the ball away from players when other team scores). Instances in which the target child was quiet and played within the rules of the game would not be an example of AbSP. AbSP essentially was poor sportsmanship (e.g., engaging in negative behaviors during a sport activity).

Procedure

A multiple baseline across subjects experimental design was used to analyze the data and test the stated hypotheses. In addition, a follow-up observation occurred two weeks after the completion of the interventions. Such a design allowed for: (a) initial demonstrations of the controlling effects prior to an intervention; (b) multiple demonstrations of the controlling effects of the intervention; and (c) an assessment of the intervention effects at follow-up.

Parental permission for participation in this study was obtained for these three individuals identified in the process explained previously. A meeting in the families' home was then scheduled to begin the process of identifying potential targets for the intervention. In addition, parents were given a consent form. which provided a description of the study, the benefits and risks of the study, information regarding new therapies, costs of the intervention, and the rights of the parents and children involved in this study. Parents who agreed to participate were given the SSRS-PE and CADS pretests to complete and mail to the primary investigator within two weeks of the orientation. In addition to parental consent, teachers who were directly involved with the participants were debriefed about the intervention, asked for their consent, and also informed to complete the SSRS-TE and CADS pretests.

Observer training

Following obtaining consent information from the parents and teachers, each of the observers that volunteered to assist with data collection were trained. The primary and secondary observers were graduate students who have received training on observational methods, as well as behavioral definitions. The observers all had at least

one year of experience in behavioral observations. In addition, observers were trained using the observational recording device designed by the primary investigator prior to the initiation of the study. Unfortunately, videos were unable to be used for training purposes due to wishes expressed by the parents. Therefore, examples and nonexamples of the target behaviors were provided to the observers in training, as well as role-plays that the observers coded. Specifically, observers were trained with written, verbal, and modeled examples of the dependent measures until they reached 80% agreement using the following formula:

$$\frac{\text{Agreements}}{\text{Agreements + Disagreements}} \quad \text{X } 100$$

Baseline period

After obtaining the appropriate agreement criterion during training, the observers began to collect baseline data for all of the participants in this study. During the baseline condition, observational data were recorded for each participant's targeted behaviors prior to the introduction of the social story. No intervention occurred prior to or during this period. The SIRS was used to measure the frequency (i.e., the number of intervals of occurrence) and percentage of intervals of occurrence for each of the identified behaviors (e.g., joining in with others). If any of the targeted behaviors occurred during a 10-second interval, the observer recorded the appropriate response (e.g., active or passive) on the data collection sheet. If there was an absence of the targeted behavior (fighting, hitting, screaming) during any of the 10-second intervals, the observer recorded a mark on the accompanying data sheet. In addition, any observational notes (e.g., what the

target child said) were provided on the data sheets. All baseline observations occurred three times per week and were, on average, 15 minutes in length.

Baseline observations occurred for three weeks (or 9 data points). Such an extended baseline allowed sufficient time to ensure a stable baseline relative to the first participant. Stability was defined as a relatively constant rate of behavior, or behavior that clearly demonstrated a countertherapeutic effect (consecutive decelerating or flat trend), allowing for the proper implementation of the intervention phase. In addition, those individuals involved with the participant (i.e., parents, teachers) were shown the baseline results and asked if such trends were representative of these behaviors each day.

Prior to implementing the intervention, observations also were conducted during unstructured activities (e.g., school playground) to ascertain the median level of social interactions in which typical peers engage. Collection of peer comparison data used a Round Robin approach for every fifth interval on the SIRS data sheet. That is, during every fifth interval, data collectors selected the first comparison peer they were able to observe and recorded his/her behavior. This means that during each comparison peer interval a different child was observed. These data were collected during both baseline and intervention phases.

Peer comparison data were collected because little is known about how often social engagement occurs for a typical child. When examining higher-functioning individuals, who may already possess some appropriate skills, it becomes difficult to determine the effectiveness of the intervention. This information provided the comparison for future observations of targeted students and allowed for a direct

comparison of the effects of the social stories on increasing the social engaged time of children with AS.

Intervention phase

Three social stories were formatted according to Gray's (1994) recommendations. Ideas for the content of the social stories were derived from baseline observations and parent and teacher rating scales. In addition, input from both the parent(s) and teachers was gathered through a semi-structured interview using the Social Story Information Form (see Appendix D). This form consists of opened ended questions designed to gather general academic information (e.g., grade, reading level, comprehension), as well as information on the strengths of the child (e.g., interests and special abilities). In addition, this form allows for a functional behavioral assessment of targeted situations to occur. All of this information was used to increase the relevancy of the information presented in the social stories with target behaviors.

After the social stories were constructed for each of the participants, information regarding the most appropriate manner to implement the social story was gathered. Such information came from the Social Story Implementation Plan (Gray, 1994) (see Appendix E). This form allowed the family and the primary investigator to: (a) identify methods to introduce the social story; (b) identify support materials and/or activities that can be used for the social story; and (c) identify factors that may affect the implementation of the social story.

The primary investigator took the responsibility of establishing and maintaining rapport with parents and teachers, as well as organizing social stories around the stated deficits and recommendations for each child. Each social story was read and/or reviewed

two times per day. Intervention data were collected in the same manner as baseline data. Observations continued to occur three times per week and were approximately 15 minutes in length.

Implementation of the social story interventions progressed according to Ferron and Jones's (2002) recommendations. Specifically, the primary investigator plotted the baseline data for each participant and decided that when the data had stabilized, intervention with the first participant would begin. The observers continued to collect data. However, the observers were not told which participant was selected for the intervention. The primary investigator continued to monitor the data, and implemented the initiation of treatment with the second participant when increasing data trends were observed and maintained for at least three data points (one week) among the first participant's data. Again, the observers were not told which participant entered the treatment phase. The same process was used for the implementation of the intervention for the third participant. That is, once the data for the second participant had shown increasing trends or stabilized, as defined by at least 3 data points (one week), the primary investigator initiated the intervention.

During the intervention phase of the study, the child and the parent were the primary persons responsible for reviewing and reading the social story each day. At the end of each review session, the child and/or parent placed a sticker indicating that the social story was read and reviewed (e.g., date and time) on the journal sheet provided by the primary investigator (see Appendix I).

In addition, every two weeks, the parents and the primary investigator discussed how the intervention was progressing and if any modifications were needed. The parent

provided the investigator with information on how the child reacted to the social story, any problems with the story, and made suggestions to improve the story by using the Social Story Report Form (Gray, 1994) (see Appendix F). This form was used to keep a running record of the participants' progress and/or any difficulties with the story. Specifically, this form allowed for documentation of the participant's reaction to the social story, the child's current responses in the targeted situation, and suggestions/recommendations for revising the social story. Such information provided a better understanding of where a social story was weak and in need of improvement. Such conditions help improve the likelihood of having a successful intervention.

Follow-up phase

Following the intervention phase, all social stories were faded over a period of one week. That is, each participant was instructed to read his or her respective social story with less frequency until the story was not read at all. Each family developed their own system of fading the social stories. At two-weeks following the intervention (one week after the social story was faded), observations were conducted at each participant's school. Follow-up data were collected in the same manner as baseline and intervention data. Observations occurred three times during the week and lasted approximately 15 minutes.

Inter-rater reliability

Inter-rater agreement for observations was calculated to assess reliability of the data. The same formula to calculate agreement during initial observer training was used. Inter-rater reliability was calculated by dividing the number of rater agreements (the occurrence or nonoccurrence of each behavior) by the number of agreements plus

disagreements (the two raters did not agree on the occurrence of a particular behavior) and then multiplied by 100. These reliability checks occurred during 20% of the baseline condition and 25% of the intervention condition. Observations were considered reliable if at least 80% inter-rater agreement was achieved for each observation. Inter-rate agreement was consistently above 80% for all participants. Agreement ranged from 87% to 100% for participant 1 (Darius) (X = 94%), 82% to 94% for participant 2 (Francis) (X = 87%), and 80% to 84% for participant 3 (Angelo) (X = 82%).

Data Analyses

Observational data. Observational data collected by the SIRS were used to test the first, second, and third hypotheses. With regard to the first hypothesis: *Participants in the social story intervention will show an increase in the occurrence of identified target behavior(s) in unstructured natural settings following treatment, as compared to baseline condition*, descriptive visual analyses were conducted. Three visual inspection methods were employed for analyzing changes in the frequency of each targeted social engagement behavior for each participant. All visual inspection analyses considered both the changes in individual participant's data, as well as comparing changes across each of the participants. First, the average daily percentage of active, passive, and absence of social engagement was graphed for each participant for the entire course of the study. Graphs display the day-to-day performance of each participant. Data relative to percentage of social engagement was analyzed to examine changes in each participant's mean daily percentage of active, passive, and absence of social engagement during baseline, intervention phases, and at follow-up. A mean trend line for each phase was plotted as a solid line in each phase for each participant—providing a summary line.

Percentages of participant's social engaged time were also compared to peer comparison data. If participants mean data approximated the average social performance of peers, the mean trend data were considered clinically significant.

Second, data were analyzed to examine changes in the level and slope (i.e., trends) of the daily percentages for each participant during baseline, intervention, and follow-up phases. Changes in level were computed using the least squares technique within each phase (calculated by Excel). For each phase, celeration lines were drawn. The slope of each line and the initial and final level of each phase was expressed numerically. The change in level was estimated by comparing the last data point in the baseline and the first data point in the intervention phase. The smaller value was then subtracted by the larger value yielding the change in level across conditions. Similarly, for a change in slope, the smaller slope was subtracted by the larger slope yielding a change in slope across conditions. Examining changes in level and slope summarized the differences in performance across phases for each of the participants.

Slopes that indicated positive improvement in behavior were considered significant. Because the range of social functioning in children with AS is generally low, any improvement in social engagement was considered a success. However, the range of success was hypothesized to be highly variable. Therefore, data that revealed a clear indication of an increasing trend was considered significant.

Finally, observational data were analyzed to examine the percentage of overlapping data points for each participant between baseline, intervention, and follow-up phases. Overlap was computed by comparing data points in the intervention phase with baseline standards and with follow-up to intervention phases. A level of less than 70%

overlapping data points was considered significant. This level was chosen due to the fact that it was expected that much of the data would be highly variable. Because social engagement and interactions are such a broad skill, they were not expected to be linear.

In addition to these data, information from the OASIS was used to examine any collateral effects of the social story interventions. Data from the OASIS was used to determine the mean percentage of increase in socially appropriate behaviors for each of the participants. These data came from the yes/no ratio on the OASIS. Data were presented by demonstrating the mean change in percent of appropriate skills, range of the percent of appropriate skills, and correlation with the occurrence data for each participant.

Peer comparison data was used to test the second hypothesis: *Participants in the social story intervention will demonstrate clinically significant increases in social interactions/social communication*. Each participant's data was compared with a comparison peer during the observations using the SIRS. This information was then used to graph the percentages of target behaviors for each participant compared to peers. Percentages of participant's social engaged time were compared to peer comparison data. If participants mean data approximate the average social performance of peers, the mean trend data were considered clinically significant.

With regard to the third hypothesis: *Participants in the social story intervention will maintain positive treatment effects at a 2-week follow-up*, the visual analyses described in detail previously were performed. Specifically, follow-up phases for each participant were examined for change in mean, change in level and slope, as well as the percentage of overlapping data points.

Pre-, post-test data. Data pertaining to the fourth and fifth hypotheses will be tested by investigating for a statistically reliable change in pre and post-test data. The SSRS and CADS pre- and post-test composite and domains scores for each participant are presented in a table. Specifically, the fourth hypothesis: *Participants will demonstrate a decrease in unusual behavior patterns as rated by parents and teachers on pre and post-test measures*, was examined by calculating the reliable change index (Jacobson & Truax, 1991) for each subject's data on the SSRS to determine whether the magnitude of the change is statistically reliable. The test-retest reliability data for the SSRS composite scores was used to calculate the reliable change index for each participant.

In addition, the fifth hypothesis: *Participants will demonstrate a decrease in unusual behavior patterns as rated by parents and teachers on pre and post-test measures*, was examined by calculating the reliable change index for each subject's data on the CADS to determine whether the magnitude of the change is statistically reliable. The test-retest reliability data for the CADS composite scores was used to calculate the reliable change index for each participant.

Chapter IV

Results

Overview

This chapter presents the data relative to each research hypothesis in both written and visual presentation format (Figures 1 through 6). Specifically, for the first, second, and third hypotheses, visual analyses of observational data are presented. For the fourth and fifth research hypotheses pre and post-test data analyses are presented. The chapter concludes with a summary of the findings from the data analyses.

Participants' Social Communication Progress: Observational Data

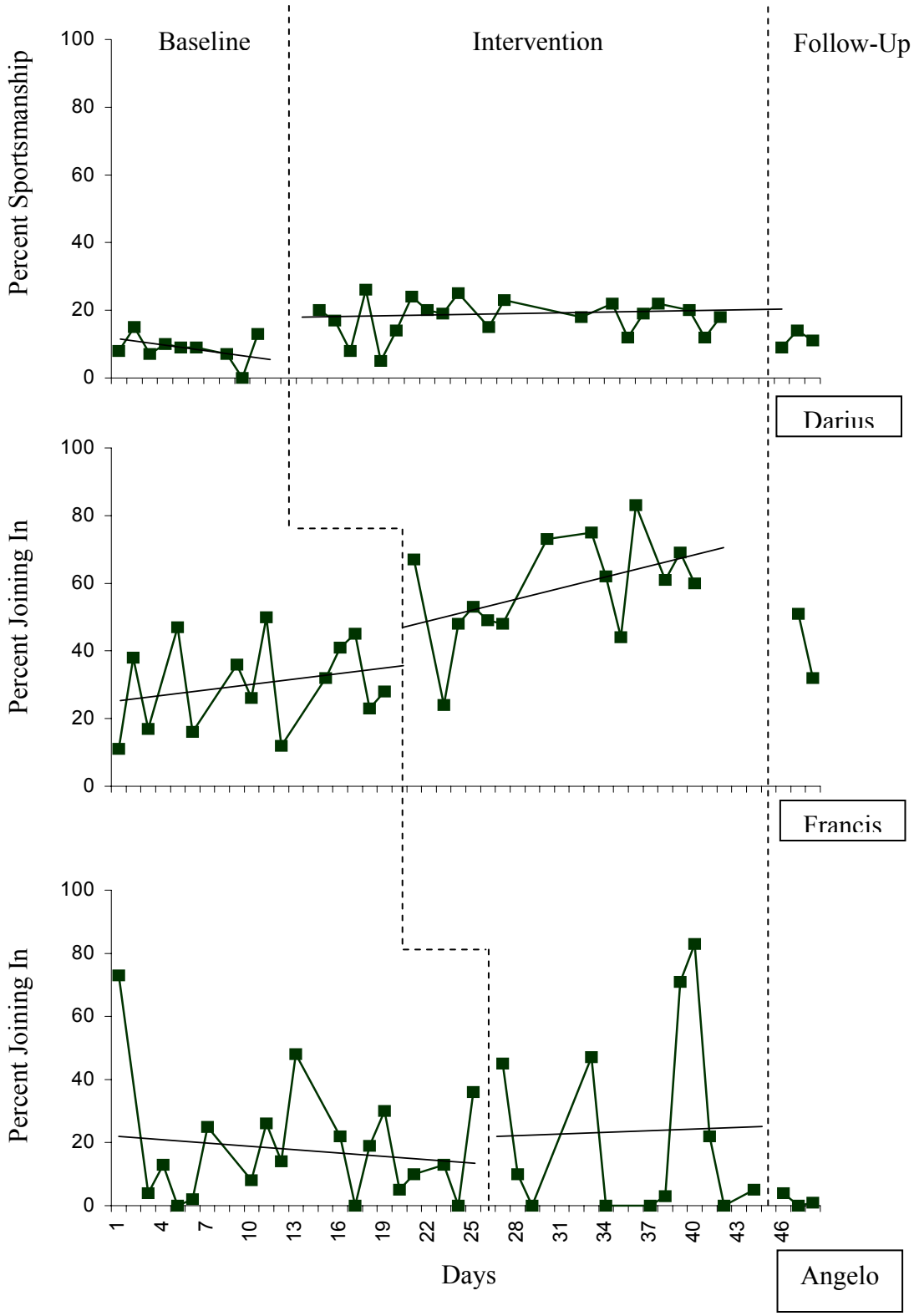
With regard to the first hypothesis: *Participants in the social story intervention will show an increase in the occurrence of identified target behavior(s) in unstructured natural settings following treatment, as compared to baseline condition*, the following results were found through visual analysis of data obtained by the Social Interaction Recording System (SIRS). Because there were three behaviors that were examined, the results are separated into categories based upon the dependent measures for each participant.

Active Display of Target Behavior

Figure 1 provides a graphic display of the percentage of active target behaviors (sportsmanship and joining in) for each participant across baseline, intervention, and follow-up phases. According to the multiple baseline design, these data show increases

in social engagement for two of the three participants following the initiation of the social story interventions. While the mean data relative to Darius and Francis during the intervention phase demonstrated substantial improvement, data for Angelo are highly variable and should be interpreted with caution. In addition, the initial effects of the data demonstrate that Darius and Francis maintained an elevated performance of active behaviors across time. A detailed description of the visual analysis conducted on active displays of target behaviors for each participant follows.

Figure 1.
Percent of Active Displays of Target Behavior Across Participants



Darius. Prior to intervention phase, Darius displayed a somewhat variable, but relatively consistent baseline of low rates of active displays of sportsmanship as indicated by the decreasing trendline (see Figure 1). The overall mean percentage of active displays of sportsmanship for Darius during baseline was 8.67%. Upon implementation of the intervention, a prompt increase in the daily percentage of active displays of sportsmanship emerged. Specifically, from the last data point during the baseline period (13% active sportsmanship) to the initial data point during the intervention phase (20% active sportsmanship) there is a 7% increase in active rates of behavior. This demonstrates the relative rapidity of change in behaviors with the implementation of the social story intervention for Darius. Although this degree of change was not replicated with successive data points, this increase persisted variably throughout the intervention phase. Specifically, Darius averaged 17.95% of active sportsmanship during the intervention phase, an increase of approximately 9.28% compared to baseline. At follow-up, Darius maintained an elevated performance of active behaviors across time. Specifically, mean percentage of active sportsmanship for Darius during follow-up phase was relatively stable at 11.33% (2.66% higher than baseline). Descriptive statistics relative the changes in mean are provided in Table 5.

Table 5.
Descriptive Statistics for Active Sportsmanship for Darius

	X	*SD*	*Min.*	*Max.*
Baseline	8.67%	4.21	0	15
Intervention	17.95%	5.56	5	26
Follow-Up	11.33%	2.52	9	14

Celeration lines, or trendlines, are indicated by solid lines through data points for each phase as shown in Figure 1. Trendlines depict the rates of behavior increase or

decrease over time. Prior to the implementation of the social story intervention, Darius demonstrated a decreasing trend of active displays of sportsmanship (slope = -.04). During the intervention phase, the direction of Darius's behavior changed. Specifically, the trend of active displays of sportsmanship for Darius maintained a consistent, slightly increasing trend (slope = .04) across the intervention period. When compared to baseline, this trend was both elevated and relatively consistent across time. Trendlines were not calculated for follow-up conditions because not enough data points were available to calculate an accurate trend. Table 6 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions.

Table 6.
Slope and Level Change for Active Sportsmanship for Darius

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-.04	.08	13 (@ last day)	7
Intervention	.04		20 (@ first day)	
Intervention	---	---	18 (@ last day)	9
Follow-Up	---		9 (@ first day)	

Although data for Darius during the intervention phase was highly variable, the percentage of overlap of intervention with baseline was only 25%. The percent of overlapping data points during the follow-up period was 100% when examining overlap with the intervention and baseline phases. This suggests that during the follow-up phase, mean performance remained elevated, but decreased to levels that were previously observed during the baseline period.

Francis. Francis showed a somewhat increasing baseline trend of active displays of joining in prior to treatment with an overall mean percentage of 30.14% (Figure 1).

However, determination to begin implementation of the social story intervention was based upon the decreasing number of days available to collect data prior to the end of the school year. Upon implementation of the intervention, an abrupt increase in the daily percentage of active displays of joining in occurred. Specifically, from the last data point during the baseline period (28% active joining in) to the initial data point during the intervention phase (67% active joining in) there is a 39% increase in active rates of behavior. This replicates the rapid change in behaviors following the implementation of the social story intervention demonstrated with Darius. However, this rapid change was followed by a rapid decrease in rates of active responding only to be followed by consecutive increasing data. Analysis of the anecdotal data revealed that during this second observation it was raining and the children were only permitted to play on the covered sidewalk between classrooms. Therefore, environmental factors beyond the control of this study may have contributed to the low rates of behavior seen on this day. During the intervention phase, Francis averaged 58.29% of active joining in. This change represents an increase in the use of active joining in behaviors of 28.15% compared to baseline. In addition, Francis demonstrated maintenance of skill acquisition during follow-up as indicated by a mean percentage of active joining in behavior of 41.5% (11.36% higher than baseline). However, it should be noted that fairly high variability was present throughout all phases (see Figure 1). Descriptive statistics relative the changes in mean across time for Francis are provided in Table 7.

Table 7.
Descriptive Statistics for Active Joining In for Francis

	X	*SD*	*Min.*	*Max.*
Baseline	30.14%	13.18	11	50
Intervention	58.29%	21.87	12	83
Follow-Up	41.50%	13.44	32	51

Changes in trend are depicted in Figure 1 as solid lines draw in each phase. For Francis, a steadily increasing trend was demonstrated during the baseline phase (slope = .51). Although the trend of the data for Francis was increasing, implementation of the intervention progressed due to time constraints. During the intervention phase, the trend of active displays of joining in for Francis maintained an increasing trend across the intervention period (slope = 1.10). In addition, the slope of the intervention phase trend was greater than that demonstrated during baseline. No trend data were examined for the follow-up phase due to the lack of data. The slopes of each trendline, as well as calculations of slope and level change across conditions for Francis are displayed in Table 8.

Table 8.
Slope and Level Change for Active Joining In for Francis

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	.51	.59	28 (@ last day)	39
Intervention	1.10		67 (@ first day)	
Intervention	---	---	60 (@ last day)	11
Follow-Up	---		51 (@ first day)	

Although data for Francis during the intervention phase was highly variable, the percentage of overlap of intervention with baseline was only 36%. The percent of overlapping data points during the follow-up period was 100% when examining overlap

with the intervention phases. During the follow-up phase, the percent of overlap was 50%. These data suggest that during the follow-up phase, mean performance remained above baseline for one data point, but decreased to levels that were previously observed during the baseline period.

Angelo. Angelo demonstrated a highly variable baseline with high and low rates of active joining in behaviors averaging 18.32%. Baseline data demonstrated a counter-therapeutic trend as indicated by the negative slope (see Figure 1). Upon implementation of the intervention, an increase in the daily percentage of active displays of joining in emerged. That is, from the last data point during the baseline phase (36% active joining in) to the initial data point during the intervention phase (45% active joining in) there was a 9% change in level in the positive direction. During the intervention phase, Angelo averaged 23.83% of active engagement, an increase of 5.51%. Follow-up effects were not as pronounced for Angelo as they were with Darius and Francis. The mean percentage of active displays of joining in for Angelo during follow-up was 1.67% (range 0% to 4%). This was a decrease of 16.65% from the baseline condition. Descriptive statistics relative the changes in mean across time for Angelo are provided in Table 9.

Table 9.
Descriptive Statistics for Active Joining In for Angelo

	X	*SD*	*Min.*	*Max.*
Baseline	18.32%	18.77	0	73
Intervention	23.83%	30.10	0	83
Follow-Up	1.67%	2.08	0	4

As can be observed in Figure 1, there is some change in the slope of Angelo's data across time. Specifically, during the baseline condition, Angelo demonstrated a decreasing trend (slope = -.40). Similarly, during the intervention phase, Angelo

demonstrates a slightly increasing trend (slope = .21). During both the baseline and intervention conditions there were instances of high rates of active joining in behaviors. It was noted on the data sheets that these rates of active joining in behavior were precipitated by Angelo being selected as a team captain for a game during recess or asked to participate in a game activity. However, during the majority of the observation days, Angelo was not picked as a captain nor asked to participate in activities and rates of his active joining in behavior appeared to be variable, but lower than these several points. During the follow-up phase, Angelo demonstrated decreasing rates of active joining in behaviors. Table 10 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Angelo.

Table 10.
Slope and Level Change for Active Joining In for Angelo

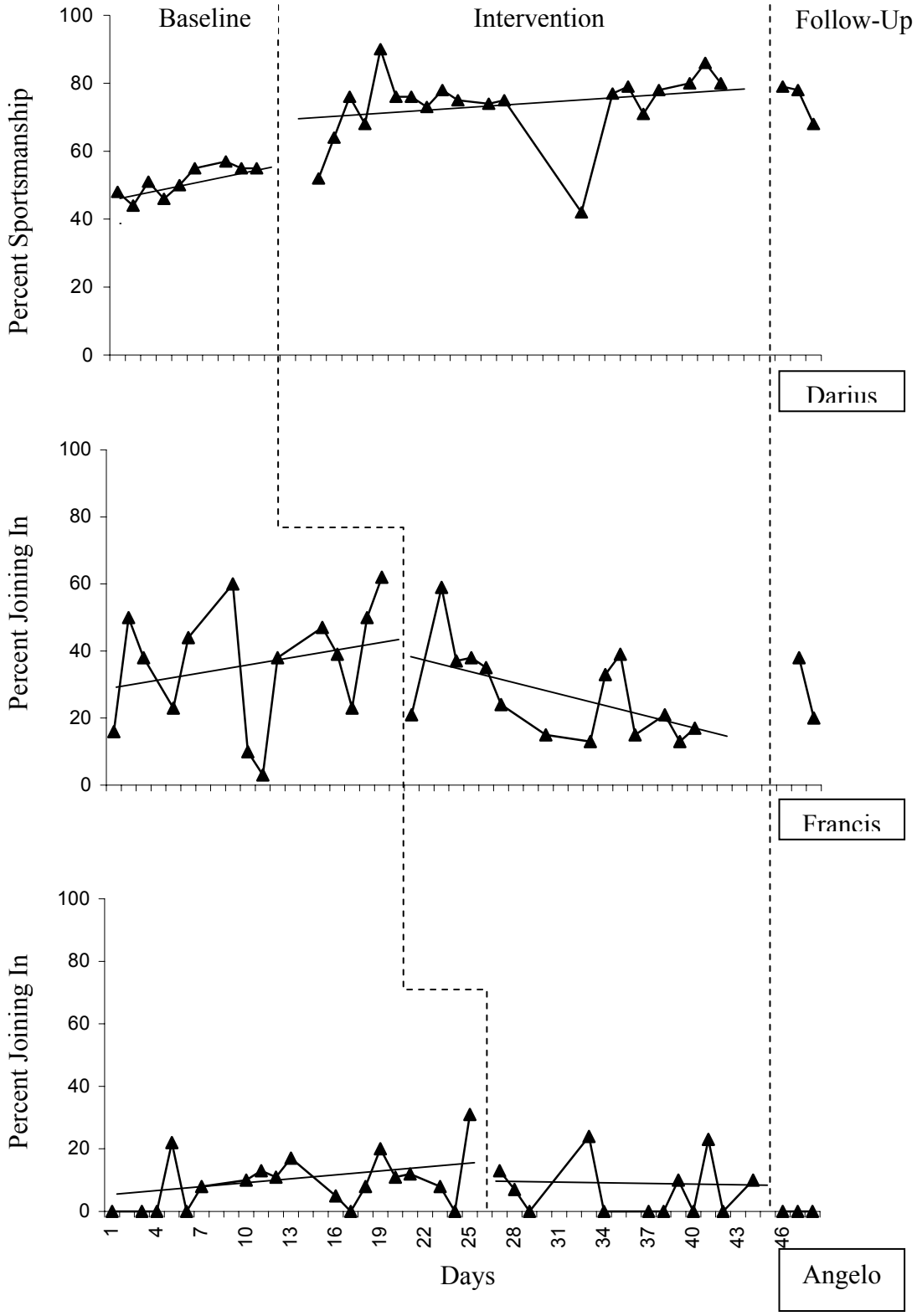
Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-.40	.61	36 (@ last day)	9
Intervention	.21		45 (@ first day)	
Intervention	---	---	5 (@ last day)	1
Follow-Up	---		4 (@ first day)	

Due to the high variability of Angelo's data, there was a high level of overlap in the data across phases. The percent of overlapping data points the intervention period with baseline was 92%. The only point that did not overlap was one of the days when Angelo was selected as a team captain. The number of overlapping data points during the follow-up period was 100% when examining overlap with the intervention and baseline phases.

Passive Display of Target Behavior

Figure 2 shows the mean percentage of passive displays of target behaviors (sportsmanship and joining in) for each participant across baseline, intervention, and follow-up phases. These data show an increase in the percent of passive sportsmanship for Darius following the initiation of the social story interventions. Specifically, the data show that Darius engaged in significantly more passive sportsmanship (e.g., following the rules of the game, accepting the loss of a game without making a negative comment) during the intervention and follow-up phases than during baseline. This effect was not replicated in either Francis or Angelo. In fact, the opposite trend was observed. Detailed description of the data relative to passive engagement for each participant follows.

Figure 2.
Percent of Passive Displays of Target Behavior Across Participants



Darius. Prior to the intervention, Darius displayed a steadily increasing baseline (see Figure 2). The overall mean percentage of passive displays of sportsmanship for Darius during baseline was 51.22%. Upon implementation of the intervention, there was a very slight decrease in the percentage of passive displays of sportsmanship. That is, from the last data point during the baseline phase (55% passive sportsmanship) to the initial data point during the intervention phase (52% passive sportsmanship) there was a 3% change in level in the negative direction. However, 3 consecutive increasing data points followed this initial starting point. Although the data did not reveal a prompt display of passive sportsmanship for Darius at the beginning of the intervention phase, overall mean percentage of behavior during the intervention period was 73.5% (range 42% to 86%). Overall, this is an increase in mean data for Darius of 22.28% from baseline to intervention phase. Similarly, these behaviors demonstrated maintenance during the follow-up period with a mean percent of passive sportsmanship of 75% (range 68% to 79%). This suggests that Darius engaged in more passive sportsmanship behaviors across time, a trend that is considered positive. Descriptive statistics relative the changes in mean across time for Darius are provided in Table 11.

Table 11.
Descriptive Statistics for Passive Sportsmanship for Darius

	X	*SD*	*Min.*	*Max.*
Baseline	51.22%	4.58	44	57
Intervention	73.5%	10.76	42	90
Follow-Up	75%	6.08	68	79

Changes in trend are depicted in Figure 2 as solid lines drawn in each phase. For Darius, a steadily increasing trend was demonstrated during the baseline phase (slope = 1.19). Although the trend of the data for Darius was increasing, implementation of the

intervention progressed due to time constraints. However, the change of mean for Darius from baseline to intervention phases supports the effectiveness of social stories. The trend continued to increase during the intervention period (slope = .32). However, this trend was not as steep as originally seen during the baseline condition. Trend data were not examined for the follow-up phase due to insufficient data. Table 12 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Darius

Table 12.
Slope and Level Change for Passive Sportsmanship for Darius

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	1.19	-.87	55 (@ last day)	3
Intervention	.32		52 (@ first day)	
Intervention	---	---	80 (@ last day)	1
Follow-Up	---		79 (@ first day)	

The percentage of overlap of intervention compared to baseline was only 10%, which reveals that most of the intervention data were significantly above percentages of engagement established during baseline. The percent of overlapping data points during the follow-up period was 100% when examining overlap of intervention with follow-up. These results suggest that during the follow-up phase, mean performance remained at similar levels to the intervention phase. Overlapping data points for a comparison of the follow-up and baseline conditions revealed no overlap. All follow-up data were above baseline percentages.

Francis. Mean percent of passive joining in decreased across time for Francis. Figure 2 displays an increasing trend in baseline for Francis and a mean percent of

passive engagement of 35.93% prior to implementation of the intervention. Upon implementation of the social story intervention, an abrupt decrease in the daily percentage of passive joining in emerged. Specifically, from the last data point during the baseline phase (62% passive joining in) to the initial data point during the intervention phase (21% passive joining in) a 41% decrease in level occurred. Although this degree of change was not replicated with successive data points, this decrease persisted variably throughout the intervention phase. Overall, mean data for Francis during the intervention phase was 27.14% (range 13% to 59%). These data represent a decrease of 8.74% compared to baseline. However, this decline in percentage of passive engagement is expected given the nature of social interaction. That is, with an increase in active engagement (discussed previously) it should be expected that passive engagement would decrease. Likewise, during the follow-up phase, similar results were found. Specifically, mean percent of passive joining in for Francis during follow-up was 29% (range 20% to 38%). Descriptive statistics relative the changes in mean across time for Francis are provided in Table 13.

Table 13.
Descriptive Statistics for Passive Joining In for Francis

	X	*SD*	*Min.*	*Max.*
Baseline	35.93%	18.29	3	62
Intervention	27.14%	13.44	13	59
Follow-Up	29%	12.73	20	38

Changes in trend are depicted in Figure 2 as solid lines draw in each phase. For Francis, a steadily increasing trend was demonstrated during the baseline phase (slope = .73). However, during the intervention phase, the trend decreased (slope = -1.14). Trend data were not calculated for the follow-up period due to insufficient data. Table 14

highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Francis.

Table 14.
Slope and Level Change for Passive Joining for Francis

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	.73	-1.87	62 (@ last day)	41
Intervention	-1.14		21 (@ first day)	
Intervention	---	---	17 (@ last day)	21
Follow-Up	---		38 (@ first day)	

The percentage of overlap for all levels was 100%. This reveals that most of the intervention data was highly variable, and the data for intervention and follow-up phases were within the range of baseline behaviors. However, visual inspection of the data (see Figure 2) demonstrates the decrease of variability during the intervention period. The overlap of 100% for all levels is attributed to the wide variability of baseline data (see Figure 2).

Angelo. Prior to intervention phase, Angelo demonstrated a variable, but somewhat increasing, baseline of passive joining in behaviors (see Figure 2). The overall mean percentage of passive displays of joining in for Angelo during baseline was 9.26% Upon implementation of the intervention, there was an abrupt decrease in the daily percentage of passive joining in behaviors. Specifically, from the last data point during the baseline period (31% passive joining in) to the initial data point during the intervention phase (13% passive joining in) there is an 18% decrease in Angelo's passive rates of joining in behavior. Throughout the intervention phase, Angelo demonstrated relatively stable, but variable data. Mean percent of passive joining in for Angelo during

the intervention phase was 7.25%. Thus, a small decrease of 2.01% from intervention to baseline phases occurred. As was the case with Francis, a decrease in the percent of passive engagement may signify increased use of active behaviors when interacting with others. During follow-up, Angelo did not engage in any passive joining in behaviors Descriptive statistics relative the changes in mean across time for Angelo are provided in Table 15.

Table 15.
Descriptive Statistics for Passive Joining In for Angelo

	X	*SD*	*Min.*	*Max.*
Baseline	9.26%	8.74	0	31
Intervention	7.25%	9.01	0	24
Follow-Up	0%	---	0	0

As can be observed in Figure 2, there is some change in the slope of Angelo's passive joining in data across time. Specifically, during the baseline condition, Angelo demonstrated an increasing trend (slope = .41). On the other hand, during the intervention phase, Angelo demonstrated a slightly decreasing trend (slope = -.06). Based on decreasing rates of passive behavior, there appears to be some change. However, these data should be considered cautiously due to the highly variable data, as well as the lack of significant change demonstrated in Angelo's active rates of joining in. Table 16 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Angelo's passive joining in behaviors.

Table 16.
Slope and Level Change for Passive Joining for Angelo

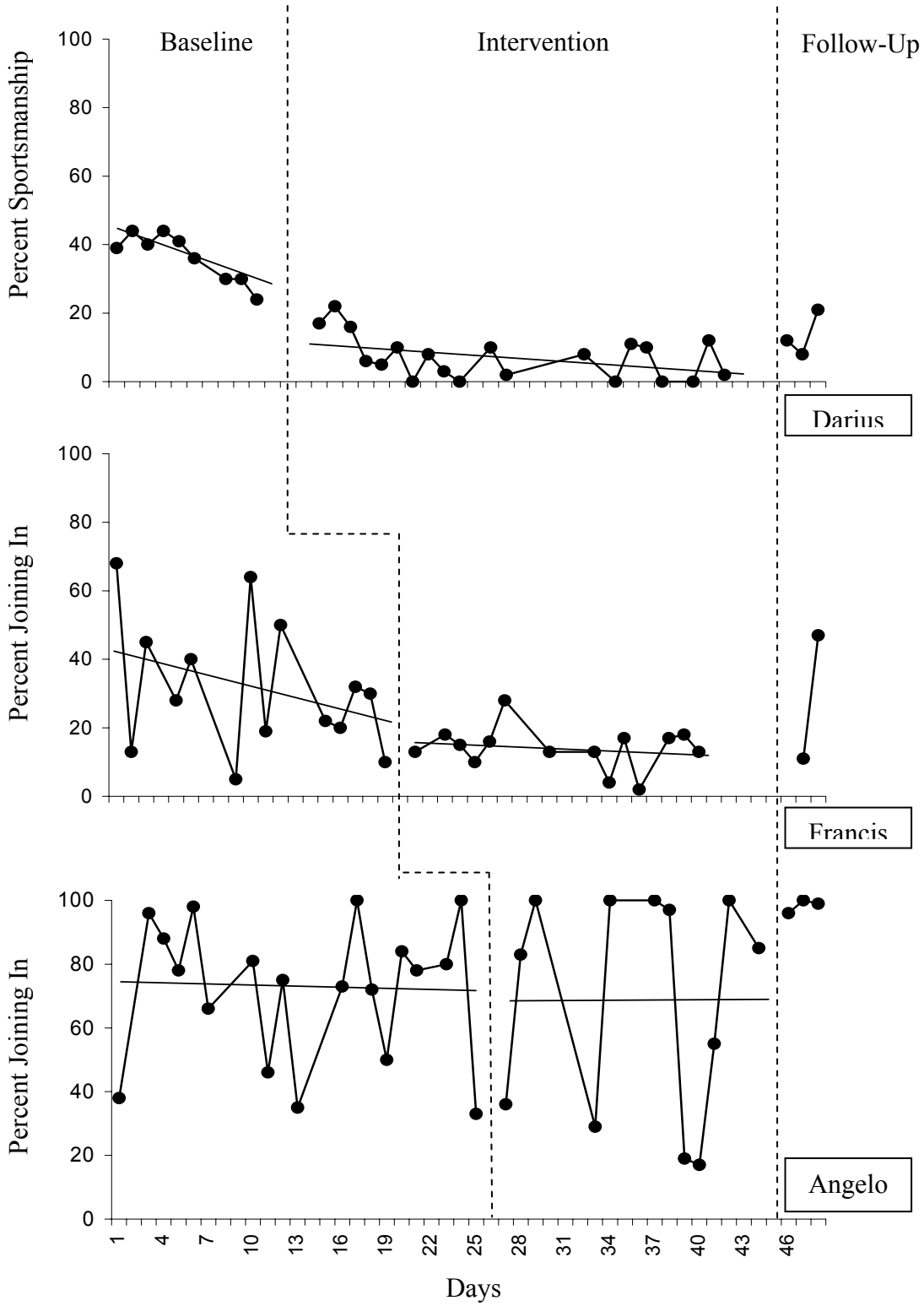
Condition	Slope	Change in Slope	Level	Change in Level
Baseline	.41	-.47	31 (@ last day)	18
Intervention	-.06		13 (@ first day)	
Intervention	---	---	10 (@ last day)	---
Follow-Up	---		0 (@ first day)	

Due to the high variability of Angelo's data, there was a high level of overlap when comparing each condition to baseline. The percent of overlapping data points across all conditions was 100%. These data demonstrate the highly variable nature of Angelo's data, as well as suggest that no significant change occurred across time. This lack of significant change is clearly displayed in Figure 2.

Absence of Target Behavior

Figure 3 displays the mean percent of absence of target behaviors across participants during three treatment phases. The data show that Darius and Francis engaged in significantly less negative behaviors during the intervention and follow-up phases of the study than during the baseline phases. This change in the rates of absence of target behavior was not observed for Angelo. Detailed summaries of the data in terms of changes in level, slope, and percent of overlapping data points follow.

Figure 3.
Percent of Absence of Target Behavior Across Participants



Darius. Prior to the intervention, Darius displayed a decreasing percentage of absence of sportsmanship (see Figure 3). Although data revealed a trend in the hypothesized direction, initiation of the intervention proceeded due to the decreasing rates of active sportsmanship for Darius during baseline. The overall mean percentage of absence of sportsmanship for Darius during baseline was 36.44%. Upon implementation of the intervention, there was a slight decrease in the percentage of absence of sportsmanship behaviors for Darius. Specifically, from the last data point during the baseline period (24% absence of sportsmanship) to the initial data point during the intervention phase (17% absence of sportsmanship) there is a 7% decrease in Darius's absence of sportsmanship behavior. During the intervention phase, mean percentage of the absence of sportsmanship behavior was 7.1%. Overall, this is a decrease in mean data for Darius of 29.34% from baseline to intervention phase. Following the withdrawal of the social story intervention, mean level for the absence of sportsmanship behavior increased. Specifically, mean level of the absence of sportsmanship behavior during follow-up was 13.67%. However, the mean level during the follow-up condition was still far below the baseline rates of absence of sportsmanship. Such a change in means across conditions demonstrates maintenance of behavior change for Darius. Descriptive statistics relative the changes in mean across time for Darius are provided in Table 17.

Table 17.
Descriptive Statistics for Absence of Sportsmanship for Darius

	X	*SD*	*Min.*	*Max.*
Baseline	36.44%	7.00	24	44
Intervention	7.1%	6.46	0	22
Follow-Up	13.67%	6.66	8	21

Changes in trend are depicted in Figure 3 as solid lines drawn in each phase. For Darius, a steadily decreasing trend was demonstrated during the baseline phase (slope = -1.94). Similarly, during the intervention phase, Darius's behavior continued to demonstrate a decreasing trend (slope = -.30). Slope was not calculated for the follow-up period due to insufficient data. Table 18 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Darius.

Table 18.
Slope and Level Change for Absence of Sportsmanship for Darius

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-1.94	1.64	24 (@ last day)	7
Intervention	-.30		17 (@ first day)	
Intervention	---	---	2 (@ last day)	10
Follow-Up	---		12 (@ first day)	

The percentage of overlap of intervention with baseline was 0%. Suggesting that all of the intervention data were significantly below percentages of absences of joining in behavior established during baseline. The percent of overlapping data points during the follow-up period was 67% when examining overlap with the intervention phase. This result suggests that during the follow-up phase, mean performance remained at levels similar to the intervention phase. Overlapping data points for a comparison of the follow-up and baseline conditions revealed no overlap.

Francis. Prior to intervention phase, Francis displayed a highly variable, but decreasing baseline of absence of joining in behaviors (see Figure 3). The overall mean percent of the absence of joining in behavior for Francis during baseline was 31.86%. Upon implementation of the social story intervention, there was a very slight increase in

the percent of Francis's absence of joining in behavior. Specifically, from the last data point during the baseline phase (10% absence of joining in) to the initial data point during the intervention phase (13% absence of joining in) there was a 3% increase in level. This change in level was in contrast to the hypothesized direction. However, overall percent of absence of joining in behaviors for Francis decreased to 14.07% during the intervention period, a change from baseline of 17.79%. In addition, the variability decreased substantially (see Figure 3). During the follow-up phase, there was an increase in the mean level of absence of joining in behaviors. Specifically, mean percent of absent behaviors for Francis during follow-up was 29%. This change represents an increase of 14.93% from intervention to baseline conditions. However, the follow-up mean performance remained lower than baseline. Descriptive statistics relative the changes in mean across time for Francis are provided in Table 19.

Table 19.
Descriptive Statistics for Absence of Joining In for Francis

	X	*SD*	*Min.*	*Max.*
Baseline	31.86%	19.38	5	68
Intervention	14.07%	6.29	2	28
Follow-Up	29%	25.46	11	47

As can be observed in Figure 3, there is change in the slope of Francis's data across time. Specifically, during the baseline condition, Francis demonstrated a decreasing trend (slope = -1.13). Similarly, during the intervention phase, absence of joining in behaviors demonstrated a decreasing trend (slope = -.20). A trendline for the follow-up condition was unable to be determined due to the lack of a data. Therefore, it is difficult to determine the direction of Francis's absence of joining in behavior

following the intervention. Table 20 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Francis.

Table 20.
Slope and Level Change for Absence of Joining In for Francis

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-1.13	.93	10 (@ last day)	3
Intervention	-.20		13 (@ first day)	
Intervention	---	---	13 (@ last day)	2
Follow-Up	---		11 (@ first day)	

During the intervention phase, the percentage of overlap of intervention with baseline was 100%. However, visual inspection of the intervention period reveals a distinct pattern of decreased variability (see Figure 3). Comparison of the intervention and follow-up conditions revealed an overlap of 67%. Similarly, the percent of overlapping data points during the follow-up period was 100% when examining overlap with the baseline condition. However, it is difficult to determine the maintenance of the behavior change due to the lack of sufficient data during the follow-up phase.

Angelo. Prior to intervention phase, Angelo displayed variable rates of absence of joining in behaviors (see Figure 3). The overall mean percentage of absence of joining in behaviors for Angelo during baseline was 72.16%. Following baseline, there was little change in the rates of absence of joining in behaviors during the intervention condition (see Figure 3). Specifically, Angelo averaged 68.42% of absence of joining in during the intervention phase, a decrease of 3.74% compared to baseline. In addition, there was very little change in level from baseline to intervention. At follow-up, Angelo's mean percentage of absence of joining in increased to 98.33%. These data demonstrate a

substantial increase when compared to both intervention and baseline conditions. Overall, these data suggest that the percent of the absence of joining in behavior demonstrated little change across conditions. Descriptive statistics relative the changes in mean are provided in Table 21.

Table 21.
Descriptive Statistics for Absence of Joining In for Angelo

	X	*SD*	*Min.*	*Max.*
Baseline	72.16%	21.97	33	100
Intervention	68.42%	34.59	17	100
Follow-Up	98.33%	2.08	96	100

Celeration lines are indicated by solid lines through data points for each phase as shown in Figure 3. For Angelo, a relatively flat trend was demonstrated during the baseline (slope = -.11) and intervention phases (slope = -.003). No trendlines were calculated for the follow-up condition due to the few number of data points available. Table 22 highlights the slopes of each trendline, as well as calculations of slope and level change across conditions for Angelo.

Table 22.
Slope and Level Change for Absence of Joining In for Angelo

Condition	Slope	Change in Slope	Level	Change in Level
Baseline Intervention	-.11 -.003	.107	33 (@ last day) 36 (@ first day)	3
Intervention Follow-Up	--- ---	---	85 (@ last day) 96 (@ first day)	(-) 9

The data for Angelo are highly variable throughout both the baseline and intervention phases (see Figure 3). During the intervention phase, the percentage of overlap of intervention with baseline was 75%. The percent of overlapping data points

during the follow-up period was 100% when examining overlap with the intervention and baseline phases. The overlap data suggest that the intervention had little impact on decreasing Angelo's rates of absences from joining in activities.

OASIS Data

Observational data collected from the OASIS form was used to examine any collateral effects of the intervention for each participant. That is, information regarding social interaction skills (e.g., eye contact, calling peers by their name, smiling) for each participant was compared across conditions to examine mean changes in the use of appropriate interaction skills and if there were any changes in the rates of these behaviors. Descriptive data for each participant are detailed in Table 23. Mean changes that were in the hypothesized direction appear in italics.

Table 23.
OASIS Descriptive Data for Each Participant

	X	*SD*	*Min.*	*Max.*
Darius				
Baseline	49.00%	11.03	33	67
Intervention	*56.53%*	8.74	40	67
Follow-Up	*51.00%*	3.46	47	53
Francis				
Baseline	47.93%	14.43	20	67
Intervention	*64.58%*	20.25	27	100
Follow-Up	*57.00%*	14.14	47	67
Angelo				
Baseline	41.50%	24.95	0	73
Intervention	25.22%	32.52	0	80
Follow-Up	4.33%	7.51	0	13

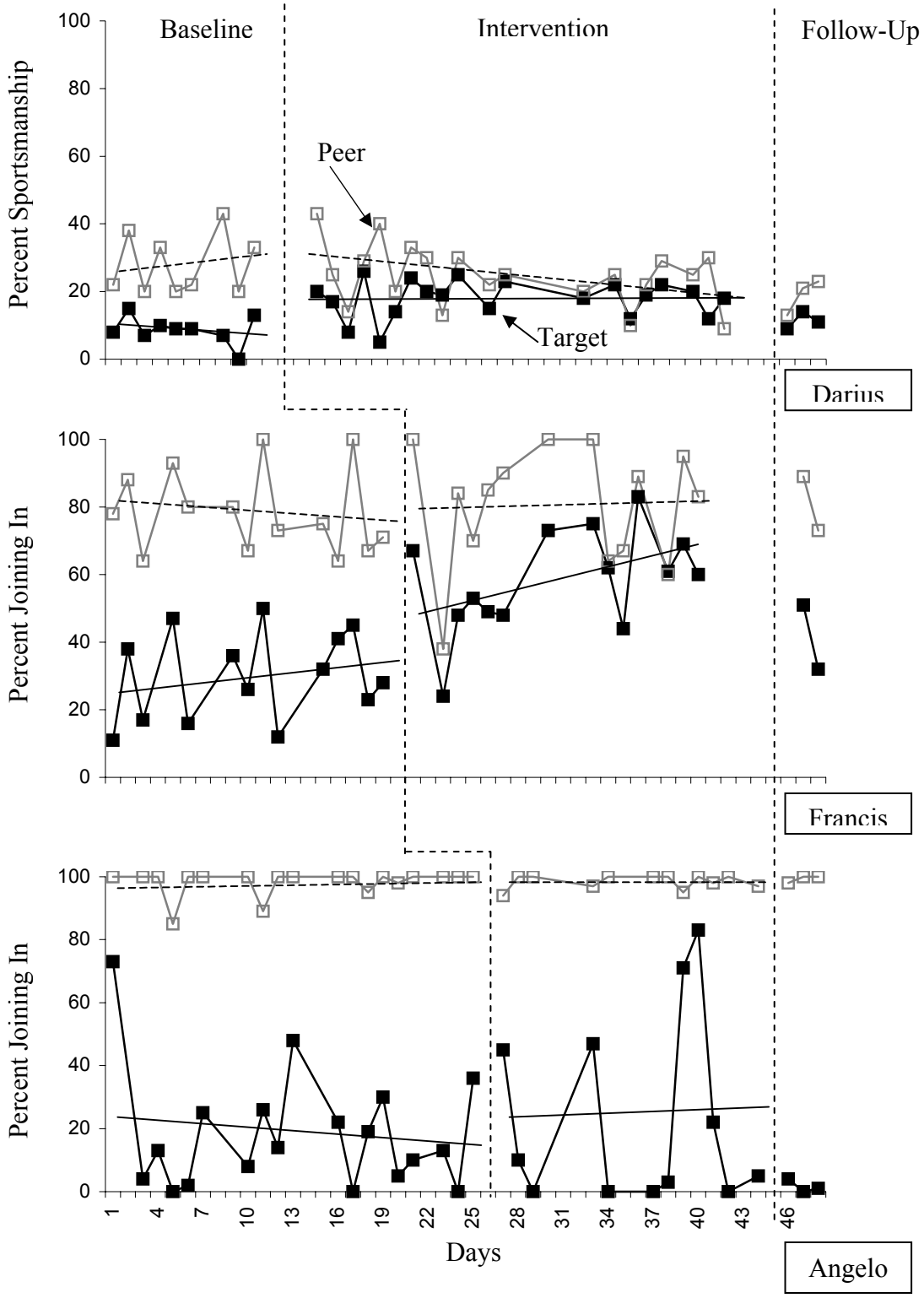
These data demonstrate that Darius and Francis displayed more appropriate social interaction skills following baseline conditions. In addition, there appears to be some maintenance regarding the use of these appropriate social interactions following the

intervention. Specifically, both Darius and Francis displayed mean percentages of these skills higher than baseline conditions. However, the same effects were not observed for Angelo. In fact, Angelo displayed decreasing rates of appropriate social interaction skills across both intervention and follow-up conditions.

Participants' Social Communication Progress: Peer Comparison

With regard to the second hypothesis: *Participants in the social story intervention will demonstrate clinically significant increases in social interactions/social communication*, the following results were found through analysis of peer comparison data for each of the identified target behaviors across participants. Specifically, data from the participants and peer comparisons were analyzed visually to determine if rates of active, passive, and absence displays of target behaviors approached peer levels of these behaviors.

Figure 4.
Percent of Active Displays of Target Behaviors Across Participants with Peer Comparison



Active Comparison

Darius. Figure 4 displays the percent of active sportsmanship behavior for Darius and comparison peers. The data show that over time, Darius approached peer levels of sportsmanship behaviors. In addition, a correspondence between Darius and peer behavior is demonstrated. That is, on days when peers displayed relatively low rates of active sportsmanship, the same effects are displayed by Darius during the intervention period. Although these effects also appear during baseline and follow-up conditions, the level of correspondence is not as pronounced as during intervention (see Figure 4).

Mean levels of active sportsmanship for Darius with peer comparisons are displayed in Table 24. These data show that during the intervention period, Darius's mean level of active displays of sportsmanship approached the level of his peers. Specifically, during baseline there was a difference in rates of active sportsmanship between Darius and his peers of 19.22%. However, during the intervention period this difference decreased substantially to 6.75%. Similar effects were demonstrated during follow-up. Specifically, Darius's mean level of active sportsmanship differed from his peers by 7.67%.

Table 24.
Mean Level of Active Sportsmanship for Darius with Peer Comparison

	X		*SD*	
	Darius	*Peer*	*Darius*	*Peer*
Baseline	8.67%	27.89%	4.21	8.94
Intervention	17.95%	24.70%	5.56	8.98
Follow-Up	11.33%	19.00%	2.52	5.29

Francis. Figure 4 displays the percent of active joining in behavior for Francis and comparison peers. The data show that over time, Francis approached peer levels of

joining in behaviors. In addition, a correspondence between Francis and peer behavior is demonstrated. That is, on days when peers displayed relatively low rates of active joining in, Francis displays the same effects during the intervention period. These effects are similar across all phases of data collection.

Mean level of active joining in for Francis and peers are displayed in Table 25. These data show that during the intervention period, Francis's mean level of active displays of joining in approached the level of his peers. Specifically, during baseline there was a difference in rates of active joining in between Francis and his peers of 48.43%. However, during the intervention period this difference decreased to 22.06%. Effects during follow-up did not reveal similar effects. Specifically, during follow-up there was a 39.50% difference between Francis's active rates of joining in when compared with peers. While the difference in mean levels are not as pronounced as displayed in Darius's data, visual inspection of the data (see Figure 4) display an increasing trend during the intervention phase.

Table 25.
Mean Level of Active Joining In for Francis with Peer Comparison

	X		*SD*	
	Francis	*Peer*	*Francis*	*Peer*
Baseline	30.14%	78.57%	13.18	12.45
Intervention	58.29%	80.35%	21.87	18.23
Follow-Up	41.50%	81.00%	13.44	11.31

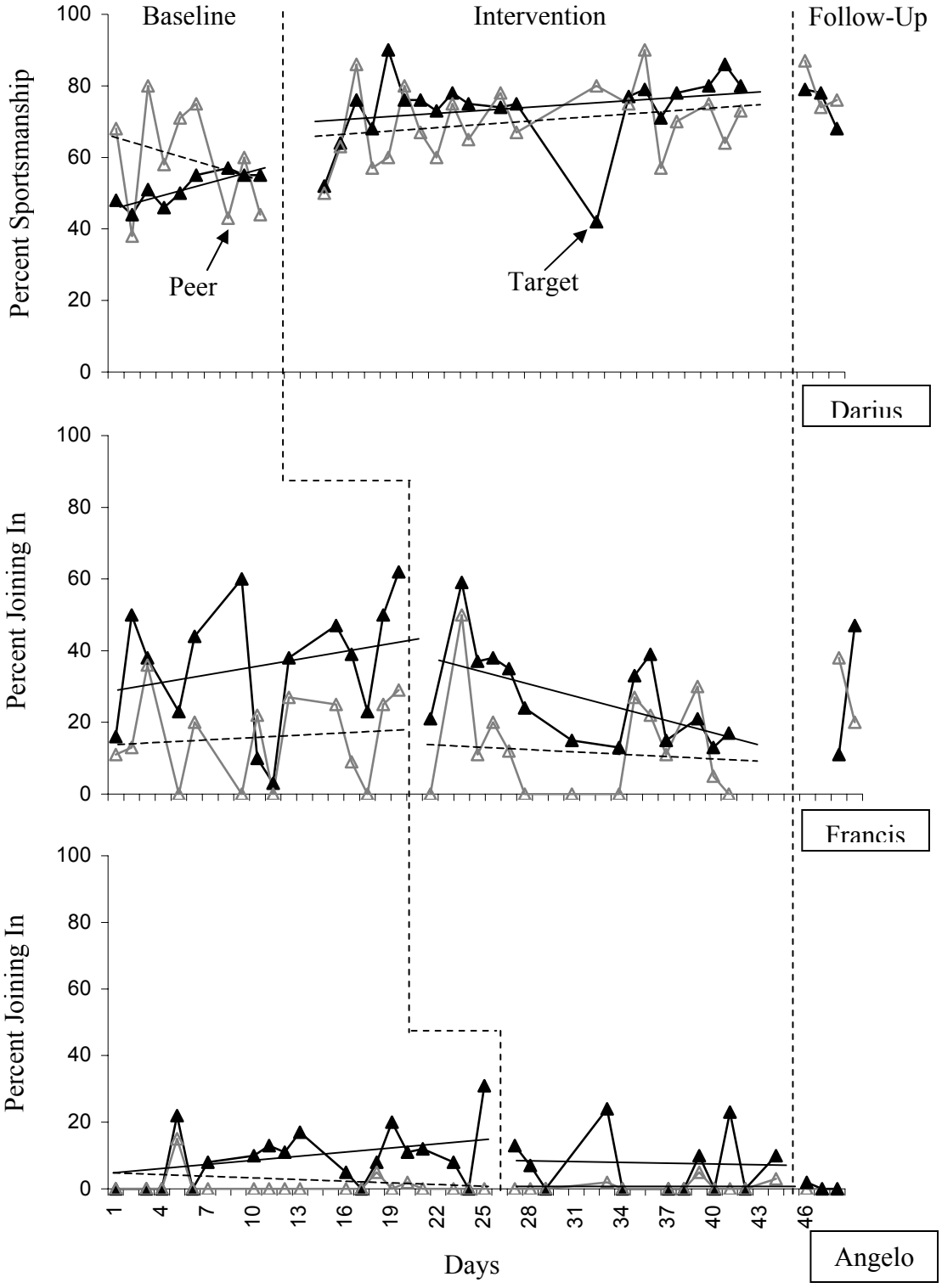
Angelo. Figure 4 displays the percent of active joining in behavior for Angelo and comparison peers. The data show that over time, Angelo did not approach peer levels of joining in behaviors. Mean level of active joining in for Angelo and peers are displayed in Table 26. These data show that across all conditions, Angelo's mean level

of active displays of joining in differed substantially from his peers. However, during times when Angelo was asked to be a team captain (first data point during baseline on Figure 4) or prompted to play a game (8 and 9 data point during intervention on Figure 4), his data approached peer levels of active joining in.

Table 26.
Mean Level of Active Joining In for Angelo with Peer Comparison

	X		*SD*	
	Angelo	*Peer*	*Angelo*	*Peer*
Baseline	18.32%	98.26%	18.77	4.20
Intervention	23.83%	98.42%	30.10	2.19
Follow-Up	1.67%	99.33%	2.08	1.15

Figure 5.
Percent of Passive Displays of Target Behaviors Across Participants with Peer Comparison



Passive Comparison

Darius. The percent of passive sportsmanship behavior for Darius and comparison peers are displayed in Figure 5. These data show that over time, Darius and comparison peers approached the same level of performance during the intervention phase. In addition, there was some correspondence between Darius and peers during both the intervention and follow-up conditions, but not during baseline.

Mean level of passive sportsmanship for Darius with peer comparisons are displayed in Table 27. These data show that during the intervention period, Darius's mean level of passive displays of sportsmanship was similar to the level of his peers. During the intervention period Darius's percent of passive sportsmanship increased to a level that was higher than, but consistent with the trend of his peers (see Figure 5). Both Darius and his peers demonstrated similar mean passive sportsmanship during the follow-up period.

Table 27.
Mean Level of Passive Sportsmanship for Darius with Peer Comparison

	X		*SD*	
	Darius	*Peer*	*Darius*	*Peer*
Baseline	51.22%	59.67%	4.58	15.17
Intervention	73.50%	69.60%	10.76	10.43
Follow-Up	75.00%	79.00%	6.08	7.00

Francis. Figure 5 displays the percent of passive joining in behavior for Francis and comparison peers. The data show that over time, Francis demonstrated more passive joining in behaviors than compared to peers. Data also show a correspondence between Francis's behavior and comparison peers. This trend is demonstrated during baseline and

intervention phases. However, during the intervention phase, Francis's passive joining in behavior began to decrease and match that of his peers (see Figure 5).

Mean level of passive joining in behavior for Francis and comparison peers are displayed in Table 28. These data show that during the baseline and intervention periods, Francis's mean level of passive displays of joining in were higher than the comparison peers. During the follow-up phase, both Francis and peers demonstrated the same mean percentage of passive joining in behaviors.

Table 28.
Mean Level of Passive Joining In for Francis with Peer Comparison

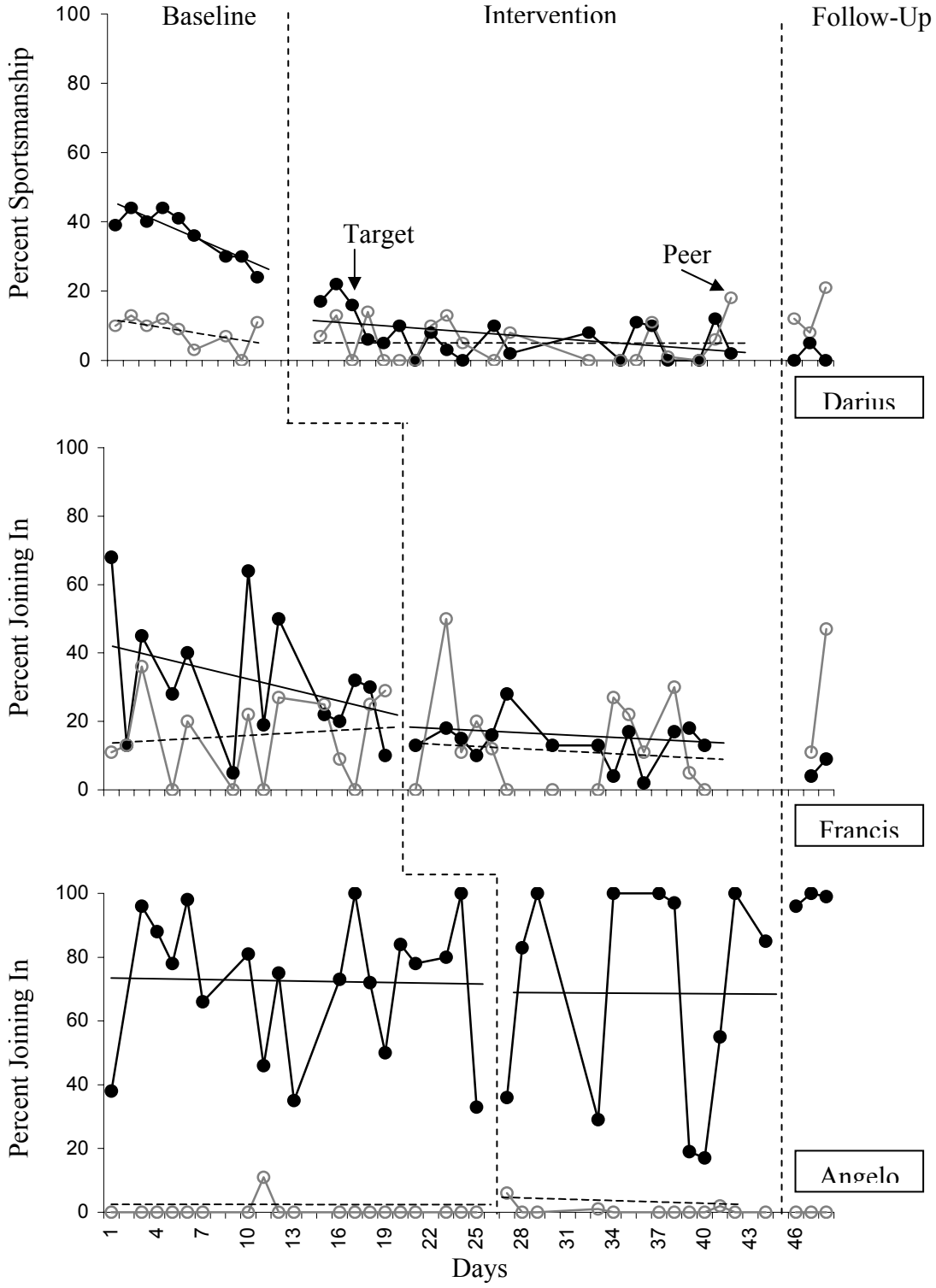
	X		*SD*	
	Francis	*Peer*	*Francis*	*Peer*
Baseline	35.93%	15.50%	18.29	12.43
Intervention	27.14%	13.43%	13.44	14.93
Follow-Up	29.00%	29.00%	12.73	12.73

Angelo. Figure 5 displays the percent of passive joining in behavior for Angelo and comparison peers. The data show that over time, Angelo and comparison peers differed in mean level of passive joining in. Peers demonstrated near zero levels of passive joining in behaviors whereas Angelo displayed variable rates of passive joining in. Mean level of passive joining in for Angelo and peers are displayed in Table 29. These data show that across all conditions, Angelo's mean level of passive displays of joining in was higher than that of his peers.

Table 29.
Mean Level of Passive Joining In for Angelo with Peer Comparison

	X		*SD*	
	Angelo	*Peer*	*Angelo*	*Peer*
Baseline	9.26%	1.16%	8.74	3.56
Intervention	7.25%	0.83%	9.01	1.64
Follow-Up	0	0.67%	0	1.15

Figure 6.
Percent of Absence of Target Behaviors Across Participants
with Peer Comparison



Absence Comparison

Darius. Figure 6 displays the percent of absence of sportsmanship behavior for Darius compared to his peers. The data show that over time, Darius approached peer levels of negative behaviors. Mean level of absence of sportsmanship for Darius with peer comparisons are displayed in Table 30. These data show that during the intervention period, Darius's mean level of absent displays of sportsmanship approached the level of his peers. Specifically, during baseline there was a difference in rates of absence of sportsmanship between Darius and his peers of 28.11%. However, during the intervention period this difference decreased substantially to 1.8%. During follow-up, the difference between Darius and his peers increased. However, this increase did not approach the same level as displayed during baseline.

Table 30.
Mean Level of Absence of Sportsmanship for Darius with Peer Comparison

	X		*SD*	
	Darius	*Peer*	*Darius*	*Peer*
Baseline	36.44%	8.33%	7.00	4.30
Intervention	7.10%	5.30%	6.46	6.04
Follow-Up	13.67%	1.67%	6.66	2.89

Francis. Figure 6 displays the percent of absence of joining in behavior for Francis and comparison peers. These data demonstrate that during the intervention period, Francis displayed absences of joining in behaviors at rates similar to his peers. Specifically, there was only a 0.64% difference between Francis and peers absence of joining in behaviors during the intervention. In addition, a correspondence between Francis and peers was demonstrated.

Mean level of absence of joining in for Francis and peers are displayed in Table 31. As these data demonstrate, there was a substantial decrease in the mean percentage of absence of joining in behaviors from baseline to intervention. However, during the follow-up phase, Francis's absence of joining in behaviors increased from the intervention level. This increase was similar to that displayed during baseline.

Table 31.
Mean Level of Absence of Joining In for Francis with Peer Comparison

	X		*SD*	
	Francis	*Peer*	*Francis*	*Peer*
Baseline	31.86%	15.50%	19.38	12.43
Intervention	14.07%	13.43%	6.29	14.93
Follow-Up	29.00%	6.50%	25.46	3.54

Angelo. Figure 6 displays the percent of absence of joining in behavior for Angelo compared to his peers. These data show that over time, Angelo and comparison peers differed in mean level of absence of joining in. Mean level of absence of joining in for Angelo and peers are displayed in Table 32. These data show that across all conditions, Angelo's mean level of absent displays of joining in was higher than that of his peers. Peers demonstrated near zero levels of absence levels of joining in behaviors, whereas Angelo displayed relatively high rates of absent joining in (see Figure 6).

Table 32.
Mean Level of Absence of Joining In for Angelo with Peer Comparison

	X		*SD*	
	Angelo	*Peer*	*Angelo*	*Peer*
Baseline	72.16	0.58%	21.97	2.52
Intervention	68.42	0.75%	34.59	1.76
Follow-Up	98.33	0	2.08	0

Participants' Social Communication Progress: Follow-Up Data

Relative to the third hypothesis: *Participants in the social story intervention will maintain positive treatment effects at a 2-week follow-up*, the following results were found. While descriptions of the follow-up data are discussed in detail in previous sections, a summary of the follow-up data for each of the participants follows.

For Darius, data demonstrate that maintenance of behaviors continued during the follow-up condition across active, passive, and absence of sportsmanship (see Figures 1-3). Specifically, Darius's rates of active and passive behaviors were lower than those that occurred during the intervention period, but remained above baseline levels. In addition, Darius's rates of absence of sportsmanship behaviors remained lower than during baseline, and only slightly above rates of behavior during the intervention phase. These data demonstrate that, for Darius, maintenance of the skill introduced in the social story intervention occurred. However, these data should be considered with caution due to the relatively few number of data points available.

Similar results were found for Francis. Specifically, data demonstrate that maintenance of behaviors occurred for Francis for active, passive, and absence of joining in behaviors (see Figures 1-3). For both active and passive joining in behaviors, data suggest that Francis continued to demonstrate improved social engagement as compared to baseline. However, this effect was not as apparent when examining the rates of absence of joining in (see Figure 3). Also, due to the lack of data points for Francis during follow-up, it is difficult to determine what future performance of each behavior would be. Although indications of maintenance are suggested, further data would be necessary to reveal a trend of performance across all three targeted behaviors.

There was no indication of any maintenance of increased social engagement for Angelo during the follow-up period across each behavior (see Figures 1-3). In fact, during the follow-up condition, rates of each behavior for Angelo actually moved in the opposite direction of the stated hypothesis and no clear effects were demonstrated to show neither improvement nor maintenance of any improvement.

Participants' Social Communication Progress: Pre-, Post-Test Data

With regard to the fourth hypothesis: *Participants will demonstrate improved social behaviors beyond identified target behaviors as rated by parents and teachers on pre and post-test* measures, the following results were found through an examination of the reliable change index (Jacobson & Truax, 1991) for each subject's data on the on the SSRS to determine whether the magnitude of the change was statistically reliable. Data from both parent and teacher pre- and post-tests are provided in Appendix O.

Social Skills Rating System (SSRS)

Darius. For the parent ratings, the reliable change index was demonstrated a significant change (RC = 1.98). When the reliable change index is greater than 1.96, it is unlikely that the post-test score is not reflecting real change. Specifically, for Darius, this result suggests that parents indicated collateral improvement of broader social skills on a standardized social skills instrument. In addition, these data reveal that change from pre- to post-test reflects more than the fluctuations of an imprecise measuring instrument. Teacher analysis of pre- and post-test SSRS did not reveal a statistically reliable change (RC = 1.88)

Francis. Both parent and teacher analyses of the SSRS did not reveal any statistically reliable change from pre- to post-test indicating that neither the parent nor the

teacher indicated significant improvement of collateral social skills adjustment. The reliable change index for the parent ratings was .88 and 1.50 for the teacher ratings.

Angelo. Unfortunately, no parent pre- and post-test data were available for Angelo. Therefore, the reliable change index for Angelo's data, as rated by the parent, was not calculated. Results of the reliable change index for the teacher ratings pre- and post-test revealed no clinical significance (RC = 1.32).

With regard to the fifth hypothesis: *Participants will demonstrate a decrease in unusual behavior patterns as rated by parents and teachers on pre and post-test measures*, the following results were found through an examination of the reliable change index (Jacobson & Truax, 1991) for each subject's data on the on the Children's Atypical Development Scale (CADS) to determine whether the magnitude of the change was statistically reliable. Data from both parent and teacher pre- and post-tests were examined. Data from both parent and teacher pre- and post-tests are provided in Appendix P.

Children's Atypical Development Scale (CADS)

Darius. For the parent ratings, the reliable change index was demonstrated a significant change (RC = 2.97). This reveals that parents indicated collateral improvement of atypical behaviors on the CADS. In addition, this reveals that change from pre- to post-test reflects more than the fluctuations of an imprecise measuring instrument. Teacher analysis of pre- and post-test SSRS did not reveal a statistically reliable change (RC = 1.19)

Francis. Similar to the results for Angelo, the reliable change index for parent ratings on the CADS was statistically reliable (RC = 2.77), indicating that the parent rated

Francis's atypical behaviors as having decreased when compared before and after the social story intervention. However, teacher ratings were not statistically reliable (RC = 1.19).

Angelo. Unfortunately, no parent or teacher pre- and post-test data were available for analysis. Therefore, the reliable change index for Angelo's data, as rated by the parent and teacher, was not calculated.

Social Story Journal

Darius. Social story journal information for Darius revealed a consistent pattern of reading his social story twice a day during the intervention period. Specifically, Darius read his social story on the way to school and during bedtime each day. Darius indicated that the social story made him feel upset (i.e., sad or mad) sometimes because he is ridiculed on the playground. However, as the intervention continued, Darius indicated that his social story made him happy and that he would practice the skills embedded in the social story. During the last two weeks of the intervention, Darius began to fade the social story, only reading it every other day. Slowly, Darius and his family began fading the social story to reading it only once during the final week of the intervention. Darius did not read his social story during the follow-up period.

Francis. Francis was very consistent in reading his social story. Specifically, Francis read his social story with his mother twice a day at home with his mother during the intervention period. Francis indicated that reading his social story made him feel happy and several journal entries indicated that he would practice the skill introduced in the story. During the last two weeks of the intervention, Francis read his story three times per week. Following the intervention, Francis ceased to read his story while on his

Spring Break for two weeks. During the follow-up period, Francis did not read his social story.

Angelo. Unfortunately, neither Angelo nor his family completed the social story journals. Therefore, it is difficult to determine at what level Angelo read his social story on a daily basis. In addition, it is difficult to determine if Angelo was able to acquire and practice the skills presented in the social story. Such information is vital in determining the effectiveness of the social story for Angelo.

Chapter V

Discussion

Overview

This chapter outlines the implications of the data relative to the hypotheses for the study. In addition, this chapter (a) outlines the significance of the current findings, (b) proposes implications for the development of social story interventions for children with Asperger's Syndrome, and (c) discusses potential considerations for future research in this area.

Impact of the Intervention

Observational Data

Social story interventions were effective in increasing specific social engagement skills in 2 out of the 3 children included in this study. Overall, the effects of the intervention appear to be most pronounced for Darius and Francis during the intervention condition. Following implementation of the social story, both Darius and Francis demonstrated improved and more consistent rates (less variability) of targeted social behaviors compared to baseline performance. In addition, Darius's and Francis's improvements maintained at elevated rates compared to baseline. Maintenance of the target behaviors for Darius and Francis not only demonstrate the impact of their respective social stories, but also suggests that social reinforcement for being included in activities on the playground may have been responsible for or contributed to their

maintenance. In addition to their individual data, Darius and Francis approached levels of performance that were similar to, or at sometimes greater than, their comparison peers across each target behavior. Interestingly, Darius and Francis demonstrated a correspondence between their rates of behavior and that of their peers. That is, if peer data were observed to decrease/increase, Darius and Francis's behavior decreased/increased. In addition to the correspondence in behavior, trends in the behavior for both the target participants and comparison peers demonstrate that for both Darius and Francis rates of behavior were equivalent to or approaching the same level of peers, which demonstrates the clinical significance of the social story interventions. Although marked increases in both Darius and Francis were observed, the same effects were not found for Angelo. Due to the individualized nature of the target behaviors, a brief description of the results for each participant is highlighted below.

A close look at the percentage of sportsmanship data for Darius revealed an increase in active and passive displays of sportsmanship during intervention, and at follow-up. In addition, Darius's rates of absence of sportsmanship behaviors steadily declined across all conditions. Overall, these data reveal positive effects for Darius across active, passive, and absence of sportsmanship during intervention and follow-up conditions. Changes in mean, level, and slope were all in the hypothesized direction and indicated substantial improvement across conditions. In addition, percent of overlap revealed low overlap (below 70%) for the three targeted sportsmanship behaviors. Specifically, the percent of overlap for active and passive sportsmanship were low when comparing intervention with baseline. Similarly, Darius displayed a continued decrease in overlapping data for absence of sportsmanship across all conditions, increasing the

confidence that maintenance effects could be attributed to the intervention. Perhaps what is most revealing regarding the effectiveness of the intervention is that Darius's level of sportsmanship behaviors matched the level of comparison peers. Performing at the same level of peers may demonstrate the ability for Darius to understand the perspectives of others and more readily read the social cues of others.

Upon closer analysis of Darius's data, it was observed that his passive rates of sportsmanship behavior occurred at rates higher than active sportsmanship. This result is not surprising considering the nature of the definitions of sportsmanship. Specifically, passive sportsmanship includes behaviors such as, following the rules of the game, accepting the loss of a game without making negative comments, and/or accepting a bad play without dissent. In many games or activities that involve reciprocal play, these may be the modal behaviors. In fact, excessively high rates of active sportsmanship (e.g., repeatedly yelling "awesome," "way to go," or "good effort") may be perceived as eccentric behavior itself because it does not occur at high rates for typical peers. Peer comparison data support this hypothesis. Specifically, during the baseline and intervention periods, peers engaged in relatively low rates of active sportsmanship (30% actively engaged). However, peer rates of passive sportsmanship were relatively high (70% passively engaged) during the same conditions. Therefore, observing an increase in passive rates of sportsmanship behaviors for Darius was considered a significant improvement, as this demonstrated his improved ability to read and understand the social cues of his peers and respond in socially appropriate ways.

Similar results for Francis were found upon the implementation of the social story intervention. Specifically, mean data demonstrated positive effects for Francis for each

targeted behavior across intervention and baseline phases. Data relative to the percentage of active rates of joining in demonstrated improvement during the intervention period for Francis as indicated by change in mean, level, and slope. Closer inspection of Francis's data reveals a sharp decrease during the second day of the intervention period (see Figure 1). However, this decrease may have been due to rain during the recess time. During this time, all of the children were under a canopy and not permitted to walk around and play in the courtyard. Such environmental constraints may have had an influence on Francis's joining in behavior.

In addition, rates of active joining in for Francis approached the performance of comparison peers during the intervention period. These results suggest that Francis engaged in a greater number of social behaviors in which he was actively contributing to a reciprocal conversation or actively participating in some play activity with one or more children. These increases in social engagement also maintained following the withdrawal of the intervention as indicated by the elevated rates of active joining in behaviors at follow-up. In addition, the percent of overlapping data points across phases for Francis provides an indication of the impact of the social story intervention on the target behaviors. Specifically, percent of overlap was low (below 70%) for active and absence of joining in behaviors across all conditions.

In contrast to Darius's data, it was hypothesized that increasing active joining in behaviors would cause a decrease in the rates of passive joining in behaviors for Francis. Unlike sportsmanship behaviors, passive joining in behaviors would indicate occurrences of independent social behavior (e.g., playing next to peers, listening to a conversation without participating). Such behaviors are countertherapeutic to the targeted behavior for

Francis. Therefore, it was hypothesized that rates of passive joining in behaviors would decrease across time. Analysis of Francis's data revealed just that. Over time, the percentage of time that Francis engaged in passive joining in behaviors steadily decreased during the intervention period. In addition, these effects were observed during the follow-up condition, demonstrating that Francis engaged in higher rates of active joining in behavior across conditions.

The results for Angelo were not as compelling. Specifically, the only positive effects that were found were changes in mean across conditions during the intervention period. Specifically, active rates of joining in and rates of absence of joining in behaviors increased in the hypothesized direction. However, the increase for both behaviors was only equivalent to 4% and may have been attributed to aggregating the highly variable data. Similarly, rates of passive joining in behavior for Angelo decreased in the hypothesized direction, but only by 2%. Further visual analyses (i.e., slope and level), demonstrated little or no change for Angelo across time. In addition, percent of overlap data did not reveal any strong indication of change across time (i.e., less than 70% overlap). Data for Angelo were highly variable and there was no visual indication of a decrease in the variability of observational data.

Several reasons for the lack of effectiveness of the social story intervention for Angelo are offered. First, it is likely that the ineffectiveness may have been due to poor adherence to the treatment protocol. That is, the degree to which the intervention plan was implemented as intended (Gresham, 1989). Specifically, the parents were responsible for making sure that Angelo read his social story two times each day during the intervention period. Unfortunately, Angelo's parents did not complete any of the

social story journal entries. Therefore, it is difficult to determine whether Angelo engaged in learning the material from the social story from day to day. Second, due to his relatively low rates of joining in behaviors, Angelo may have responded well if a reinforcement paradigm was implemented to jumpstart the effects of the social story. That is, by offering reinforcement for engaging in active joining in behaviors during recess, Angelo may have been able to understand the relationship between the social story and his subsequent behavior. A closer look at Angelo's data demonstrates a significant disparity between his rates of target behaviors with comparison peers. This disparity is most pronounced for active joining in behaviors (see Figure 4). With such a large difference between Angelo's and comparison peers' behaviors it may have been more difficult for Angelo to practice joining in. Third, Angelo may have benefited from additional practice of the social story content using role-plays. That is, Angelo's family may have set up practice opportunities for Angelo to practice the content of the social story, as well as provide him with feedback (e.g., reinforcement) regarding his usage of the skill. Finally, there remains the possibility that identifying soccer as the reinforcing activity within his social story may not have been effective enough to initiate active joining in behaviors for Angelo. Choice assessments of recess activities may have revealed a more reinforcing situation (e.g., playing in the sandbox) as the focus of his social story.

The overall results of the observational data demonstrate that the social story interventions were effective for Darius and Francis. Consistent with these findings were positive improvements in their use of appropriate social interaction skills as indicated by OASIS data. These collateral improvements are noteworthy given the persistent and

significant difficulties reported for this population in using social-communicative behaviors to initiate, respond, and maintain conversations and/or activities (Atwood, 2000; Bauer, 1995, 1996; Mundy & Stella, 2001). Overall, the observational data demonstrated that social story interventions were effective for improving the rates of social engagement for Darius and Francis, but showed little evidence of effectiveness for Angelo.

Pre- and Post-test Data

Analysis of the pre- and post-test data revealed a limited number of significant findings. Specifically, Darius's parents demonstrated clinically significant improvement on both the SSRS-PE and CADS. Such increases in collateral social skills and decreases in atypical behaviors suggest that the social story intervention may have produced change above and beyond the content of the social story for Darius. However, these results must be considered cautiously because there was no replication of these findings neither from Darius's teacher nor across participants. These results are not surprising given the pervasiveness of social impairment in children with AS. Specifically, the hallmark of difficulty for children with AS remains social functioning across multiple domains (e.g., initiating and sustaining conversations, eye contact, personal space, perspective taking), and extended time may be necessary for practice of targeted skills followed by introduction of additional target skills before long-term effects can be evaluated. In addition, the individualized nature of social stories makes it difficult to observe more global changes in behaviors in such a short time frame. Therefore, pre- and post-test measures may not have been robust enough to demonstrate significant change across multiple domains of social functioning for this study.

Significance of Findings

The findings of this study contribute in several ways to the effectiveness of social stories literature. First, this research demonstrates the potential benefits of using social story interventions to teach new prosocial behaviors to children with varied social behaviors. The results of this study were similar to those found previously and this study contributes to the growing knowledge of social story research. Specifically, the results of this study replicate the previous findings of the efficacy of social stories used to teach appropriate social skill behavior to children with autism (Noris & Dattilo, 1999; Theimann & Goldstein, 2001; Swaggart, et al., 1995). In addition, the results of this study replicate previous research by Kuttler et al., (1998) and Swaggart, et al., (1995) by demonstrating a substantial change in behavior following the implementation of the social story. Similarly, two additional studies (Kuttler, Myles, & Carlson, 1998; Lorimer, et al., 2002) demonstrated convincing evidence that the intervention was responsible for change through the use of an ABAB (Reversal) design. In each of these studies, behaviors returned to baseline following the removal of the social story interventions. However, the intended purpose of social story interventions is to attain permanent change even after the intervention is withdrawn. Therefore, a loss of treatment gains following the removal of a social story demonstrates concern for the use of social stories in applied practice. Therefore, a fading paradigm to slowly eliminate the supports provided by the social story may prove beneficial for children to maintain the treatment effects.

Aside from the previous research, the impact of this study may be even more significant for the research literature on social story interventions because: (a) it employs experimental control, and (b) is the only known research study to use a pure AS sample.

In many of the studies reviewed prior to conducting this research, lack of experimental control was an issue. For example, Noris and Dattilo (1999) and Swaggart, et al. (1995) employed an A-B design in their respective studies. Such designs do not provide sufficient information to rule out the influence of a host of confounding variables (e.g., history, maturation) (Barlow & Hersen, 1984; Kazdin, 1982). Therefore, it is difficult to determine the natural course that the behavior(s) would take had no intervention occurred (Risley & Wolf, 1972). In addition, all of the prior research literature on the effectiveness of social story interventions has been conducted with samples of children with autism and severe social and behavioral difficulties. No known studies have focused specifically on samples of children with AS.

Second, this study demonstrates the utility of conducting functional assessments prior to designing and implementing a social story intervention. Functional assessments allow for greater specification of the problematic social situation that the social story will have as its focus, as well as the salient features of the context and setting for the social story. In essence, there is a direct link of assessment data with the design and implementation of the social story intervention.

Third, this study offers a unique contribution to the research literature by employing peer comparison data to demonstrate the correspondence of participants' target behaviors with that of comparison peers. To date, no known studies have employed such a comparison to examine the clinical effectiveness of the intervention. Comparing the rates of target behaviors with comparison peers has several important implications. First, no known information could be found on how often typical peers engage in the behaviors that were under study. However, interventions for children with

autism spectrum disorders primarily focus on increasing social engagement (Brady, et al., 1987; Rogers, 2001; Twachtman-Cullen, 1998). The goal in most of this research is to reach functional levels of social engagement. However, without understanding how often typical peers engage in targeted behaviors, it is difficult to determine the level of what signifies clinical significance. This concern is particularly salient when considering social communication and social behavior. Second, comparing the rates of target behaviors with those of comparison peers in essential for demonstrating participants' development of understanding social cues. That is, if target behaviors taught through a social story began to exceed the behaviors of typical peers, the child with ASD may be ridiculed and bullied more so than he or she already is due to not fitting in with the social norms of the environment. Finally, comparison data allows for closer examination of any direct correspondence or sequence effect between typical peer behavior and the target child. That is, does the behavior of the typical peer (good or bad) have any impact on the behavior of the target individual? Results from this study revealed that there was a correspondence between the behaviors for both Darius and Francis and typical peers. The use of peer comparison data not only provides a means for the evaluating the clinical significance of behavior change, but also provides a means of changing the perceptions of teachers regarding students with severe social deficits and peculiar behaviors.

Lastly, this research contributes to the literature base by providing evidence of collateral improvements of social skill behaviors and decreases in atypical behaviors as indicated by pre- and post-test measures. The secondary changes observed in this study are consistent with Thiemann and Goldstein's (2001) recommendation that treating social behaviors within a similar response class will ultimately lead to positive changes in

untreated social behaviors. Specifically, by improving basic sportsmanship and joining in behaviors, either directly or indirectly, more opportunities to participate in day-to-day social interactions may arise that will ultimately help children with ASD to be accepted members of their school social network.

Implications for Practice

This study extends previous investigations of the positive effects of social stories for children with autism. More importantly, this study offers the much needed empirical support for strategies when considering intervention methods for students with AS. Such information is greatly needed considering the rapid increase in diagnoses and referrals for special education services for students with AS. This preliminary information may serve as a springboard for future program design and intervention implementation for children with AS in educational settings.

Writing a social story and adhering to the specifics of creating a social story may take some practices for those with no previous training. Specifically, educators/practitioners may require additional information on the types of sentences used, as well the ratio of sentences used in a social story. However, these skills can be easily acquired through Gray's (1995) original guideline for developing and implementing social story interventions for children with autism. A unique feature about social stories is the fact that no intensive training is necessary prior to using them in practice.

Overall, social stories are easy to implement across many environments, are cost effective, and can be individualized to meet the specific needs of a student with difficulties interacting socially. Due to their ease of implementation, a variety of service personnel (e.g., teachers, school psychologist, guidance counselors) would be able to

conduct social story interventions. Having a myriad of people available to implement a social story is extremely beneficial when prior implementation in home-settings has been unsuccessful. For example, for Angelo there was concern regarding the family's adherence to the intervention as was originally planned. With access to other treatment providers there is a greater likelihood that social stories will be implemented as planned.

Limitations

The small sample size and single-subject design of the current study limit the generalizability of the findings to other students. In addition, the generalizability of the treatment effects to children of other disability types (e.g., autism) are further limited due to the homogeneity of the participants. Therefore, the results of this study provide an example of an efficacious intervention protocol to improve and expand the social repertoires of individuals with AS.

Another limitation of this study involves the lack of consistency in educational environments in which the interventions were conducted. Each of the participants read their respective social story at home with a parent. Because of this, it was not possible to identify whether the manner and/or situation the social story was read has any impact on the effectiveness of the intervention. However, information regarding the individual implementation of the social story interventions is provided with the social story journals completed by the parents. For both Darius and Francis there appeared to be strict adherence to the protocol of reading their respective social stories twice a day during the intervention period. Unfortunately, social story information for Angelo was unavailable. Therefore, information regarding intervention adherence for Angelo is questionable.

Related to the lack of consistency across environments, the amounts of social consequences for each participant in their respective environments were not assessed. That is, the rates of social consequences coming from peers and teachers were not evaluated. Without such information, it is difficult to identify whether the rehearsal of the social stories was more effective than the subsequent access to the natural reinforcement the participant(s) received for engaging in the target skill. Importantly, this study was not designed to determine the contribution of this social reinforcement apart from the social stories

In addition, because there is no standard protocol for writing social stories (combining the art of social story construction with the specificity of social story components), it may be difficult to ascertain the effectiveness of such interventions. That is, when a social story does not work for one participant (e.g., Angelo), it becomes difficult to identify whether it was an effect of the social story or the concept of the social story that resulted in ineffectiveness or some other extraneous variable or an interaction of these variables.

Finally, there was a potential for multiple treatment interference effects due to the fact that the participants previously received social skill training (e.g., social skills groups at the CDC). Although there was an attempt to control for such variables, there may have been the possibility that the parents were predisposed to be more effective treatment agents because of their commitment to assisting their children with developing social skills. However, employing a multiple baseline condition for each participant prior to the beginning of the social story interventions should have minimized this limitation.

Recommendations for Future Research

The fundamental concern for future research on the effectiveness of social story interventions should be the continued use of procedures and methods that employ experimental control. From a research standpoint, the establishment of experimental control allows the researcher to conclude that a functional relationship exists between the independent and dependent variables. Further research employing experimental control would provide further validity to the practice of using social stories for children with AS. More importantly, recent trends in educational practice are calling for increased evidenced-based approaches verified through well-controlled research paradigms. Continued efforts using research designs that lack the rigor of experimental control limits the acceptability of using social stories in clinical practice. Replication of this study would prove useful for the overall research literature supporting the use of social story interventions.

In addition to demonstrating experimental control, future research endeavors should further examine training for maintenance and generalization of skills following the implementation of social story interventions. Training for maintenance and generalization is especially important for populations of children with autism spectrum disorders. Many studies have demonstrated that students with autism often do not maintain or generalize behaviors (Klinger & Dawson, 1996; Simpson & Regan, 1987; Wing, 1998b). These findings have also been reflected in recent social story research literature (Kuttler, et al., 1998; Swaggart, et al., 1995; Thiemann & Goldstein, 2001).

Future research should begin the process of delineating the effective components of social stories. That is, identifying which of the four steps (identify a target social

situation, gather functional assessment data, share information, and develop a new target skill) outlined by Gray (1995) are essential for determining the target skill, as well as the focus of the social story content? Results of this study suggest that the second component of Gray's recommendations may be the most salient. It is important to note that this step is a data collection phase and is crucial to establishing the frequency of behavior(s), as well as providing a basis for comparing the individual's behavior during and following the social story intervention. Without this component, evidence-based outcomes would be difficult to determine.

Future research also needs to explore the impact of social stories implemented alone versus the impact of social stories used in combination with reinforcement strategies for engaging in appropriate target behavior in an identified problematic social situation. Specifically, some individuals using social stories may not be immediately reinforced socially for practicing/engaging in their target skill. In fact, some students may not even attempt to use the target skill in the setting in which it occurs. By providing some initial reinforcement to the student, it may be possible to jumpstart the relationship between the social story and social behavior, as well as create ongoing social opportunities for practice of the target skill. Eventually, these initial opportunities may later promote more spontaneous initiations of the target behavior that are socially reinforced.

Additional research endeavors may also want to examine the differential benefits of participation in a similar intervention program with variable treatment durations received between groups. For example, varying the length of time and frequency that the student has access to a social story. Some social skills may take a longer amount of

instructional time to bring a student to a proficient level, not to mention produce enough opportunities for practice and success of the targeted skill. Therefore, studies examining the effects of varied instructional variables could verify the hypothesis that increasing the duration and/or frequency of the social story intervention may result in larger treatment benefits, benefits to more participants, or greater maintenance of treatment effects. However, the highly individualized nature of ASD would make creating large groups with homogeneity of variance virtually impossible. For group research, larger populations are necessary for increasing the power of findings. Gaining access to a large enough population of children with AS would be difficult since AS is still considered a low-incidence disability. In addition, the individualized nature of social stories would not bode well with group design research. Because social stories are written specifically for individual cases, finding a meaningful sample of individuals who could benefit from the specific information of one social story would prove difficult. Aside from gaining access to large enough populations, as well as creating individual social stories, the feasibility of such an endeavor would be extremely limited. A substantial amount of resources (both financial and man-hours) would be necessary.

Finally, additional research is necessary on the differential effects of social stories with various ASD (e.g., Asperger's Syndrome, Higher-Functioning Autism), as well as a variety of subtypes of typical and non-typical children (e.g., typical peers, EMH, TMH). Furthermore, as the results of this study indicated, treatment effects were not consistent across all participants. In spite of their flexibility, social story research should examine the interaction of participants' characteristics and intervention success. Such that, the

characteristics of individuals that contribute to the success of a social story intervention are identified.

Summary

In summary, this study investigated the effects of social story interventions for three children with AS. Together, the results of this study support previous positive findings regarding the use of social story interventions for children with autism. In addition, the results of this study support clinical recommendations for using social story interventions to teach prosocial skills in children with AS (Atwood, 2000; Gray, 1998, Rogers, 2000; Safran, 2001). Because this study represents the first empirical support for social story interventions with children with AS, this information should be used to assist with the development of social story interventions, as well as provide the foundation for future research. The present research provides no definitive claims of the effectiveness of social story interventions for children with AS. Rather, it adds preliminary evidence that social stories may be a beneficial method of remediating social skill difficulties for many children and youth with AS.

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Appendices

Appendix A

DSM-IV Criteria for Autistic Disorder*

A.) A total of at least six items from (1), (2), and (3), with at least two from (1), and one each from (2) and (3).

(1) Qualitative impairment in social interaction, as manifested by at least two of the following:
    a. Marked impairment in the use of multiple nonverbal behaviors, such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction.
    b. Failure to develop peer relationships appropriate to developmental level.
    c. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, brining, or pointing out objects of interest).
    d. Lack of social or emotional reciprocity.
(2) Qualitative impairments in communication, as manifested by at least one of the following:
    a. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime).
    b. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others.
    c. Stereotyped and repetitive use of language or idiosyncratic language.
    d. Lack of varied spontaneous make-believe play or social imitative play appropriate to developmental level.
(3) Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:
    a. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus.
    b. Apparently inflexible adherence to specific, nonfunctional routines or rituals.
    c. Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting or complex whole body movements).
    d. Persistent preoccupation with parts of objects.

B.) Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years: (1) social interaction, (2) language as used in social communication, and (3) symbolic or imaginative play.

C.) Not better accounted for by Rett disorder or childhood disintegrative disorder.

*American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. 1994.

Appendix B

DSM-IV Criteria for Asperger Disorder*

A.) Qualitative impairment in social interaction, as manifested by at least two of the following:

1. Marked impairment in the use of multiple nonverbal behaviors, such as eye-to-eye gaze, facial expression, body postures, and gestures to regulate social interaction.
2. Failure to develop peer relationships appropriate to developmental level.
3. A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, brining, or pointing out objects of interest).
4. Lack of social or emotional reciprocity.

B.) Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus.
2. Apparently inflexible adherence to specific, nonfunctional routines or rituals.
3. Stereotyped and repetitive motor mannerisms (e.g., hand or finger flapping or twisting or complex whole body movements).
4. Persistent preoccupation with parts of objects.

C.) The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning.

D.) There is no clinically significant delay in language (e.g., single words used by age 2 years, communicative phrases used by age 3 years).

E.) There is no clinically significant delay in cognitive development or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood.

F.) Criteria are not met for another pervasive development disorder or schizophrenia.

*American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. 1994.

Appendix C

Examples of Social Stories*

Giving a Gift

A gift is something you give someone.

People give other people gifts.

Some gifts are big.

Some gifts are small.

When I give someone a gift I might say, “Here’s a gift for you.”

It is polite to say, “Here’s a gift for you.”

People say, “Here’s a gift for you,” because it is correct.

Sometimes people give me a gift.

When people give me a gift, I will try to say, “Thank you.”

Saying, “Thank you,” is polite.

People like to hear, “Thank you,” after they give someone a gift.

Playing Fairly

It is a good idea to play fairly with my friends.

Sometimes my friend may win the game we are playing.

I will try to stay calm if my friend wins a game.

If my friend wins a game, I will ask them to play again.

It is good to play fairly at games.

* Future Education , *The Social Story Book 1994*

Appendix D

Social Story Information Form*

General Information

*Name*_____ *School Year*_____

*Grade*_____ *Teacher*_____ *School*_____

General Academic Information: **Interests/Special Abilities:**

*Reading Level:*_____ _____

*Comprehension:*_____ _____

*Math:*_____ _____

Day/Time for: *Art:*_____ *Music:*_____ *PE:*_____

*P.T.:*_____ *O.T.:*_____ *Speech:*____

*Other(s):*_____

*Names of a few classmates/friends:*_____

*Other general information:*_____

_____

Observation Notes

*Targeted situation:*_____

*Time:*_____ *Day(s):*_____

*General description of targeted situation:*_____

_____

*Child's current response:*_____*Always?:*_____

*Desired response:*_____

*Teacher(s) attribute the response to:*_____

*Parents attribute the response to:*_____

*Child attributes the response to:*_____

Observation

*Date:*___/___/___ *Day:*_____ *Time:*_____

*Notes:*_____

* Future Education , *The Social Story Book 1994*

Appendix E

Social Story Implementation Plan*

*Name:*_____ *Date:*_____

*Title of Story:*_____

*Story Format: Printed Story:*_____ *Story & Audio Cassette:*_____ *Story on Video:*____

Suggested Implementation: ***Begin Implementing story on***____/____/.

1. *To introduce the story:*_____

   _____

2. *Review schedule:*_____

   _____

3. *Monitoring responses:*_____

   _____

Progress review dates: __/__/__ __/__/__ __/__/__ __/__/__

*Suggested fading procedure:*____*fading by writing* _____*re-vising review schedule*

____*decrease verbal or other cues* _____*other*

Support Materials and Activities:

_____*revise posted classroom schedule*

_____*revise, modify written classroom rules*

_____*"Keep Me Posted" Notes*

_____*story folder*

_____*social calender/goals*

_____*story bookmark(s)*

_____*reminder sign*

_____*story passes*

_____*Daily Oral Langauge (DOL)*

_____*other*

*Describe:*_____

_____

_____

_____

Date/Notes of second observation: *Date___/___/___ Day:_____ Time:_____*

*Notes:*_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Factors which may fluctuate, change, etc.:_____

_____

_____

_____

_____

_____

_____

Possible variations which may apply:

_____*fill in the blanks*

_____*checklist story*

_____*curriculum story*

_____*generalizing with other stories*

_____*story to address fears*

_____*judgment story*

*Ideas:*_____

_____

* Future Education , *The Social Story Book 1994*

Appendix F

Social Story Report*

*Name:*_____ *Date:*___/___/___.

*Story Title:*_____

*Support Materials or Activities:*_____

*Current Review Schedule:*_____

*Do you feel the story is having a positive impact?*_____

*Child's Current Response(s) to the targeted situation:*_____

_____

_____

_____

*Child's reaction to the story:*_____

_____

_____

Any problems with the story? *No*____ *Yes*___ *Explain:*_____

_____

_____

*Suggestions for revisions, etc.:*_____

_____

_____

Please return report to: ***by:***

*Future Education , *The Social Story Book 1994*

Appendix G

Social Story for Darius

Sportsmanship:

Page 1:
My Social Story Book: Sportsmanship

Page 2:
After lunch we go to recess. Sometimes, recess is on the playground.

Page 3:
When I get to the playground, I like to play football. There are other kids who like to play football with me too.

Page 4:
When I play football, I should remember to be a good sport, and never let losing the game bother me.

Page 5:
A good sport is someone who says "good job" or "awesome" during a good play or for winning the game, no matter whose team they are on.
A good sport would never yell at anybody while playing football during recess. That hurts other's feelings.

Page 6:
I will try to practice my sportsmanship skills when I play football during recess.
I will try to say things like "good job," "nice pass," or "awesome."

Page 7:
If I show all of these sportsmanship skills and don't get mad, my friends will want to play with me more often.

Page 8:
I want kids to like me and play with me, so I need to show good sportsmanship skills so they will think of me as a fair person.

Appendix H

Social Story for Francis

Joining In with Friends:

Page 1:
My Socials Story Book: Joining In with Friends

Page 2:
Usually, I have recess most of the days I go to school.

Page 3:
Recess is a time that I can go outside.
I can walk and run around, or I can talk to other kids.

Page 4:
Most of the time during recess, I like to talk to other kids because I love to hear what other people have to say.

Page 5:
Looking at people is a VERY important part of talking to them, and it is a very nice thing to do.

Page 6:
I should never turn and walk away from anyone when I am talking, unless I am asked to do so.
If I turn away, I will hurt their feelings, and they will think I don't care about them.

Page 7:
I would be hurt if my friends walked away from me, and my friends may not want to talk to me again.

Page 8:
When I am talking to other kids at recess, I should try to look at a part of their face and listen to what they say.

Page 9:
I want to be a good friend, and I'm proud to be a good friend.

Appendix I

Social Story for Angelo

Joining In with Friends:

Page 1:
My Socials Story Book: Joining In with Friends

Page 2:
I love playing with other kids during recess.

Page 3:
The most fun times I have are when I join kids who are already playing soccer on the playground.

Page 4:
I do this by asking in a nice gentle voice, "Can I play with you?"

Page 5:
If they say yes, then I ask, "Show me how to play."

Page 6:
As long as I keep joining other kids, I will be popular and have lots of friends.

Page 7:
When I join other kids who are playing, I really feel like I have friends and that I belong to the group.

Appendix J

SIRS

Social Interaction Recording System

Child Observed:	School Name:
Date:	Setting:
Observer:	PE Class Other:
Reliability Observer:	Recess/Playground
Time of Observation:	Cafeteria/Lunch

Partial	1	2	3	4	5*	6	7	8	9	10*	S	P
ABx												
PBx												
AbBx												

Partial	11	12	13	14	15*	16	17	18	19	20*	S	P
ABx												
PBx												
AbBx												

Partial	21	22	23	24	25*	26	27	28	29	30*	S	P
ABx												
PBx												
AbBx												

Partial	31	32	33	34	35*	36	37	38	39	40*	S	P
ABx												
PBx												
AbBx												

Partial	41	42	43	44	45*	46	47	48	49	50*	S	P
ABx												
PBx												
AbBx												

ABx = Active display of target behavior
PBx = Passive display of target behavior
AbBx = Absence of target behavior

Appendix J (Continued)

Partial	51	52	53	54	55*	56	57	58	59	60*	S	P
ABx												
PBx												
AbBx												

Partial	61	62	63	64	65*	66	67	68	69	70*	S	P
ABx												
PBx												
AbBx												

Partial	71	72	73	74	75*	76	77	78	79	80*	S	P
ABx												
PBx												
AbBx												

Partial	81	82	83	84	85*	86	87	88	89	90*	S	P
ABx												
PBx												
AbBx												

Partial	91	92	93	94	95*	96	97	98	99	100*	S	P
ABx												
PBx												
AbBx												

Target Student		***Peer Comparison**	
S ABx:	% ABx:	P ABx:	% ABx:
S PBx:	% PBx:	P PBx:	% PBx:
S AbBx:	% AbBx:	P AbBx:	% AbBx:
Total Intervals Observed:		Total Intervals Observed:	

Appendix K

OASIS

Observation of Appropriate Social Interaction Skills

Section I: Identifying Information

Child's Name:_____ Male_____ Female_____
School:_____ Grade:_____
Date:_____
Observer's Name:_____
Reliability Observer:_____

Section II: Response Record

Carefully read each item. Ask yourself if the child can do what the item says. Check either *Yes* or *No* by each item. If you are uncertain or doubt that the child can do what the item states, check *No*.

Check *Yes* for those items that the child can do right now or is beginning to do.

Check *No* if the child cannot do what the item says. Remember, if you have not heard it or seen it, mark *No*.

Yes	No		
___	___	1.	Smiles at a familiar person.
___	___	2.	Calls peers by their name.
___	___	3.	Ask questions using words such as "who," "what," and "where."
___	___	4.	Starts a conversation with his or her peers.
___	___	5.	Refers to himself or herself by name.
___	___	6.	Makes eye contact with peers close to him or her for at least 5 seconds.
___	___	7.	Uses age-appropriate language to talk to other peers.
___	___	8.	Responds to other peers verbally, physically, or gesturally.
___	___	9.	Engages in reciprocal conversations with peers.
___	___	10.	Hands something to or receives something from peers
___	___	11.	Invites others to join in activities.
___	___	12.	Gives compliments to peers.
___	___	13.	Cooperates with peers without prompting.
___	___	14.	Joins ongoing activity or group without being told to do so.
___	___	15.	Accepts peers ideas for group activities.

Total Appropriate Skills _____ Percentage Appropriate Skills _____

Appendix L

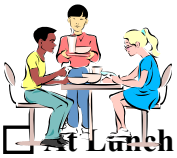
Social Story Journal

Subject's Social Story Journal

Today's Date:_____ Time:_____AM/PM

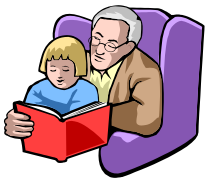
I read my story called:_____

I read it:



☐ **At home** ☐ **In the bus/car** ☐ **On Playground** ☐ **At Lunch** ☐ **Other**

I read it with:



☐ **A friend** ☐ **Just Me** ☐ **An Adult** ☐ **Other**_____

The story makes me:

☐ **Happy** ☐ **Sad** ☐ **Mad** ☐ **Confused**

Appendix M

Joining In Response Definitions

Actively Joining In (AJI):

Definition: Instances in which the target child is contributing to a reciprocal conversation or is actively participating in some play activity with one or more children.

Examples of AJI:	Nonexamples of AJI:
Playing next to each other and using a variety of social exchanges to show their recognition of peers (e.g., talking to a peer about a game that is being played on the playground).	Engaging in any sort of aggressive act such as cursing, shouting, pushing, name calling, hitting, and making forceful bodily contact with someone else during a conversation or a play activity (AbJI).
Borrowing or lending toys, using each other's toys, or sharing accomplishments (e.g., successfully building a tower with blocks).	Making verbalizations with bizarre content, such as delayed echolalia consisting of dialogue from a television show (AbJI).
Participating in any type of organized group game that involves taking turns (e.g., tag, hide-and-seek) or fulfilling a group role (e.g., playing goalie in soccer).	Walking up and observing without actively joining in (PJI).
Making "small talk" with another peer (e.g., did you see the football game yesterday?).	Playing independently and separately from peers (AbJI).

Passively Joining In (PJI):

Definition: Instances in which the target child is playing next to peers, using the same toys or engaged in the same activity, but playing independently of those peers. This also includes times when students are engaging in conversation, rather than play*.

Examples of PJI:	Nonexamples of PJI:
Mimicking the behavior(s) of other children who are close to them.	Aimlessly walking around a peer group talking to himself (AbJI).
Watching a group of peers playing a game and following the group format alone.	Silently reading while peers are actively playing around the target child (AbJI)
Walking up to or sitting with a group of peers and listening to conversation without participating.	Not using or sharing any of the toys with those around him (AbJI).
	Watching or listening to peers but participating in the reciprocal interaction (AJI)

Absence of Joining In (AbJI):

Definition: Instances in which the target child does not display any verbal, physical, or gestural initiations or responses to peers*.

Examples of AbJI:	Nonexamples of AbJI:
Engaging in a game or other activity by himself.	Actively participating in an activity/conversation with peers (AJI)
Not responding to his or her name being called by another peer.	Child walks up to a group of peers and listens (PJI)
Refusing to share toys on the playground	
Fighting, name calling, and making forceful bodily contact with someone else.	

* The primary distinction between PJI and AbJI behaviors is that in the instance of AbJI, the student is not physically near other peers during play or socialization.

Appendix N

Sportsmanship Response Definitions

Active Sportsmanship (ASP):

Definition: Instances in which the target child actively treats teammates, opponents, and/or coaches with respect. Active displays of sportsmanship should demonstrate an awareness of encouraging group play through verbal, physical, or gestural means.

Examples of ASP:	Nonexamples of ASP:
Offering positive encouragement during play activity (e.g., saying "good job," "way to go," "awesome," "good luck," "maybe next time," "good effort").	Allowing a new child to play in the activity who does not understand the rules (PSP).
Cheering for opponents or own team members after a good play or score (e.g., clapping when a team scores, telling the other team "good play").	Accepting the out performance of an opposing team member without making excuses and/or negative comments (PSP)
Helping a player up off the ground.	Refusing to shake hands (AbSP)
Maintaining integrity during play activity (e.g., congratulating opposing team for winning, not accepting another players poor behavior during the play activity).	Talking down to other players on opposing or own team (e.g., "you suck," "I was open.") (AbSP).

Passive Sportsmanship (PSP):

Definition: Instances in which the target child attends to the parameters of a game/activity with a full commitment to participatory cohesion. Passive displays of sportsmanship should demonstrate aspects of fairness and plays in an appropriate manner.

Examples of PSP:	Nonexamples of PSP:
Following and/or playing within the rules of the game (e.g., not cheating, not intentionally hurting an opponent or other team member).	Offering encouraging comments to opposing or own team (e.g., "nice pass," "good work," "maybe next time") (ASP).
Accepting a bad play or bad call without dissent (e.g., not arguing with the team if ball is not caught; maintaining control when ball is dropped, walking back to play without saying a word). Going with the flow of the game.	Kicking dirt/sand on the shoes of opposing team member who scores. (AbSP).
Adjusting play to keep the game fun (e.g., allowing an extra player; taking turns sitting out of a game;	Offering help to opposing or own team member. (ASP).

Examples of PSP:	Nonexamples of PSP:
Allowing the other team to start play first.	Making excuses for lack of ability during the game (AbSP).
Accepting the loss of the game without making negative comments to self or others.	

Absence of Sportsmanship (AbSP):

Definition: Instances in which the target child does not display any verbal, physical, or gestural sportsmanship initiations or responses to peers nor displays equality and fairness in his play.

Examples of AbSP:	Nonexamples of AbSP:
Arguing with opponents or own team members (e.g., yelling at other players, making excuses; complaining about team members' performance).	Cheering all good plays throughout the game whether made by own or opposing team (ASP).
Making negative comments or sarcastic remarks to opponents or own team members (e.g., cheering when his team scores, talking down to other players, laughing when someone gets hurt).	Telling the opposing team or own team members "good play" during the game (ASP).
Intentionally violating the rules of the game (e.g., cheating).	Accepting the loss of a game graciously (PSP).
Making aggressive actions towards opponents or own team members (e.g., running after opponent who just scored, throwing the ball away from players when other team scores).	Following and/or playing within the rules of the game (e.g., not cheating, not intentionally hurting an opponent or other team member) (PSP).

Appendix O

SSRS Pre/Post-Test Ratings

	Pre-Test Raw Score Means		Post-Test Raw Score Means		Average Raw Mean Score		Reliable Change Index	
	Parent	*Teacher*	*Parent*	*Teacher*	*Parent*	*Teacher*	*Parent*	*Teacher*
Darius	26	25	35	35	51.3	42.3	1.98*	1.88
Francis	52	39	56	44	51.3	42.3	.88	1.50
Angelo	---	32	---	39	51.3	42.3	---	1.32

* indicates a clinically significant change

Appendix P

CADS Pre/Post-Test Ratings

	Pre-Test Raw Score Means		Post-Test Raw Score Means		Reliable Change Index	
	Parent	*Teacher*	*Parent*	*Teacher*	*Parent*	*Teacher*
Darius	41	15	26	9	2.97*	1.19
Francis	32	17	18	23	2.77*	1.19
Angelo	---	---	---	---	---	---

* indicates a clinically significant change