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Using Video Modeled Social Stories to Increase the Social Communication Skills of Children with High Functioning Autism/Asperger's Syndrome

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Using Video Modeled Social Stories to Increase the Social Communication Skills of

Children with High Functioning Autism/Asperger's Syndrome

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
Department of Psychological and Social Foundations
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Using Video Modeled Social Stories to Increase the Social Communication Skills of
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Frank J. Sansosti

ABSTRACT

The purpose of this study was to investigate the effects of individualized video-modeled Social Story interventions on the social communication skills of three children with High Functioning Autism/ Asperger's Syndrome (HFA/AS). Using a multiple-baseline across participants design, video-modeled Social Stories were implemented and direct observations of the participants' identified target behaviors were collected two times per week during unstructured school activities (e.g., recess). Overall, data demonstrated that video modeled Social Stories were effective for improving the rates of social communication for the participants, though modifications to allow access to social reinforcement was needed in two cases. In addition, all three participants demonstrated maintenance of skills at a two-week follow-up. However, generalization of skills was only observed for one participant. The present research provides no definitive claims of the effectiveness of a combined intervention for children with HFA/AS. Rather, it adds preliminary evidence that a combined intervention that teaches social communication skills and provides for a model of appropriate behavior may be a beneficial method of remediating social skill difficulties for many children and youth with HFA/AS.

Chapter I

Introduction

In 1943, Leo Kanner, a Baltimore child psychiatrist at Johns Hopkins, made his first historic publication describing 11 young children with a pattern of social withdraw and abnormal behavior. 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). By a remarkable coincidence, both Kanner and Asperger independently described groups of children with the same fundamental symptomatology and both chose to use the label *autism*.

Despite their similarities, Asperger focused a great deal of attention on individuals who developed highly grammatical speech at age expectancy, and who demonstrated a preoccupation with topics of special interest that dominated the child's life. In addition, Asperger noted that many of his patients possessed what appeared to be normal cognitive abilities. Although Asperger described his patients as being socially isolated, he emphasized that they were aware of the existence of others, but approached social interactions in odd or inappropriate ways (Wing, 1991). Despite these apparent

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differences from Kanner's original work, Asperger's descriptions remained limited to Germanic writings until Lorna Wing's influential review in 1981.

Wing's (1981) review of Asperger's work dramatically increased awareness and interest in Asperger's concepts. Most importantly, her review broadened the perception of autism as a spectrum of disorders that included children who did not meet criterion for autism but still presented with clear social impairments (Kugler, 1998). Today, the term autism spectrum disorders (ASD) is used commonly to describe the characteristics of the disability that may present themselves in various combinations, from very severe to very mild. At one end of the spectrum are children with classic autism. These children have more severe deficits, including significant cognitive and speech delays. At the other end of the spectrum are those children with similar characteristics of classic autism but display normal to above-average cognitive abilities and normal language abilities, at least superficially. Such children are commonly referred to as having high functioning autism (HFA) or Asperger's Syndrome (AS).

Overall, HFA/AS may involve the same fundamental symptomatology, differing only in degree or severity, and the debate of whether there is a need for two distinct diagnostic terms is ongoing. HFA/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 usually milder than that seen in classic 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 (Bauer, 1996; Klin, & Volkmar, 1999; Kugler, 1998; Prior, Eisenmajer, Leekam, Wing, Gould, Ong, & Dowe, 1998). Children with HFA/AS generally have average to above average

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cognitive abilities (sometimes in the superior range). In addition, children with HFA/AS often demonstrate language function that is generally stronger than that observed in other Pervasive Developmental Disorders (PDD), but often is unusual in pragmatic ways (Bauer, 1996; Klinger & Dawson, 1996; Landa, 2000). These cognitive and language differences present a diagnostic pattern that is different from that observed in classic autism.

In sum, HFA/AS is characterized by deficits in social interaction and stereotyped behavior patterns, yet is not associated with clinically significant deficits in cognitive development. Furthermore, while language often develops, it is generally not used for communicative purposes, or is used in inappropriate ways. Although consideration of the language and behavioral issues are important for any intervention for children with HFA/AS, the focus here is on a discussion of the social sequelae of HFA/AS, and the research that is available to support the sequence of social dysfunction.

<center>Social Impairments in Children with HFA/AS</center>

Children with HFA/AS may be anywhere from withdrawn to active on a continuum of social behavior. At times, they may prefer to spend time alone, or appear to have little awareness of, or interest in others. In some instances, children with HFA/AS may attempt to interact with others in abnormal, socially clumsy, or unacceptable ways (e.g., blurting out socially inappropriate comments and not understanding the impact of those comments on others). Despite individual variability, social communication skills of children with HFA/AS are characterized by a failure to: (a) recognize and orient to social stimuli (e.g., name calling, clapping) and social cues (e.g., body language, gestures, facial

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expressions, tone of voice); (b) understand the perspective of others; and (c) initiate and maintain conversations with others (Twatchman-Cullen, 2000).

To better understand the pattern of social difficulties in children with HFA/AS, some investigations have turned to understanding the capacity and nature for social cognition, which is characteristic of all human social interactions (Mundy & Stella, 2001). Social cognition is currently believed to follow a developmental progression and refers to the ability to infer the mental states of others (e.g., perspectives, beliefs, intentions) from behavior. This hypothesized component is commonly 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 ASD are often blind to these social cues. Baron-Cohen (1995) used the term *mindblindness* to describe the inability of individuals with deficits in ToM to appreciate the feelings, knowledge, or beliefs in other people, nor fully recognize or interpret his/her own thought processes. Simply stated, a deficit in ToM does not enable a child with HFA/AS to distinguish his or her own thoughts or feelings from the thoughts and feelings of others. According to this view, a disturbance in ToM gives rise to the difficulties that children with HFA/AS have in social understanding and communication. For example, a child with HFA/AS may 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 (Landa, 2000; Mundy & Stella, 2000; Twachtman-Cullen, 2000). Likewise, a child with HFA/AS may have difficulty understanding how their own actions (e.g., engaging in specific routines during lunch; talking excessively about trains) may affect the thoughts of others around them.

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The ability to read social situations and to adjust one's communicative behavior based on the external behaviors of others is a task that is performed effortlessly in typically developing children (Twachtman-Cullen, 2000). Therefore, the ability to hold the capacity for ToM is governed largely by the indirect, socially mediated environmental cues that can be particularly abstract. However, children with HFA/AS often are constrained by what is observable in a very concrete, physical world. Because children with HFA/AS have a specific difficulty in understanding and interpreting abstract social information, they are particularly compromised in their ability to engage in reciprocal social interactions.

Given this understanding, interventions should focus on a combination of teaching perspective taking and demonstrating appropriate behavioral responses. Despite recent understanding of ASD, little research has been conducted on the effectiveness of educational interventions to determine whether and how specific strategies to encourage social integration of children with HFA/AS are successful. Nevertheless, several suggestions have been provided for practitioners and researchers that offer useful starting points (Atwood, 2000).

Social Stories

A strategy that is increasing in popularity within schools is the use of Social Stories (Gray, 1998). Social Stories are individualized short stories that can be used to assist individuals with ASD in interpreting and understanding challenging or confusing social situations (Gray, 1997). The norms for behavior in a targeted context, the perspective(s) of others, and the specific steps for implementing the appropriate social skill(s) are instructed and modeled through a short written story with picture cues.

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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). Essentially, a social story assists a child's accurate understanding of social information for a given setting (Gray, 1998), and provides "how-to" instruction for initiating, responding, and maintaining appropriate social interactions (Sansosti, Powell-Smith, & Kincaid, 2004).

The effectiveness of using Social Stories to teach children with HFA/AS have been demonstrated on a wide range of social skills such as, greeting people appropriately and sharing toys (Swaggart, et. al., 1995), reducing tantrum behaviors (Kuttler, Myles, & Carlson, 1998; Lorimer, Simpson, Myles, & Ganz, 2002; Scattone, Wilczynski, Edwards, & Rabian, 2002), increasing appropriate play (Barry & Burlew, 2004), increasing the frequency of social communication behaviors (e.g., securing attention, initiating requests; Thiemann & Goldstein, 2001), and improving positive social behaviors (Norris & Dattilo, 1999; Sansosti & Powell-Smith, 2004). In each of these studies, positive trends in the data were observed. However, while current research demonstrates preliminary support that Social Stories are effective approaches when working with individuals with ASD, these results should be considered cautiously. Due to either a lack of experimental control, weak treatment effects, or confounding treatment variables in published studies, it is difficult to determine if Social Stories alone were responsible for durable changes in important social behaviors. In fact, other strategies may have been responsible for some of the changes observed in participants in existing research. Therefore, other active

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treatment variables (e.g., prompting, reinforcement paradigms, modeling) implemented concurrently with Social Stories may be necessary to create a desired change in behaviors (Sansosti, Powell-Smith, & Kincaid, 2004).

<center>Video Modeling</center>

A more recent strategy shown to be effective for children with HFA/AS is the use of video modeling. Video modeling involves having the child with HFA/AS watch a videotape of a model engaging in a target behavior to be imitated (Charlop-Christy, Le, & Freeman, 2000). By modeling behaviors on videotape in a purposeful and often discrete manner, the child learns to memorize, imitate, and generalize the behaviors. Video modeling, used as a means to modify, change, or shape behavior, appears to be an appropriate strategy for use at home and school. In addition, it may increase the effectiveness of existing treatment programs by offering multiple exemplars necessary to increase the generalization of skills (Stokes & Bear, 1977).

To date, six empirical studies relating to the effectiveness of video modeling interventions used with children with ASD have been identified in the literature. Specifically, video modeling has been demonstrated to increase conversational speech skills (Charlop & Milstein, 1989), perspective taking (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003), play sequences (D'Ateno, Mangiapanello, & Taylor, 2003), and social initiations (Nikopoulos & Keenan, 2003; 2004) in children with ASD. In addition to such preliminary positive findings, Charlop-Christy, Le, and Freeman (2000) found video modeling to be more time and cost efficient than traditional live modeling. Despite these positive results, several questions remain. First, the effects of video

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modeling have not been investigated in applied settings (e.g., school). In each of the studies, video modeling interventions were created and tested in clinic settings. While this is important to establish video modeling as a potentially effective approach, it leaves many unanswered questions, such as how applicable and accepted video modeling would be in non-clinic based settings. Second, current video modeling research has not investigated maintenance of skills with children with HFA/AS over time. Finally, the effects of a combined intervention of video modeling with other visual support strategies (e.g., Social Stories) have not been investigated.

<center>Summary</center>

The presence of language and elevated cognitive skills seen in children with HFA/AS can be effectively used to foster their social skill development. The presence of such elevated skills allows for the future development of interventions to be more rigorous in design, but addresses the area of deficit more directly. Two areas of intervention that appear to hold the most promise for educating children with HFA/AS are through the use of Social Stories and video modeling. Through the use of Social Stories, children with HFA/AS learn the skills necessary to understand social situations and subsequently increase interactions with others. Video modeling has also shown promise as a successful intervention for augmenting learning with children with HFA/AS. Specifically, video modeling capitalizes on the visual strengths of individuals with autism and promotes learning through repetition and sameness in training sessions. By combining these intervention approaches, it is hypothesized that teaching social skills to children with HFA/AS will be successful for two reasons. First, children with HFA/AS need direct instruction on understanding the perspectives of others. Second, children with

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HFA/AS benefit most from interventions that model specific skills. For these reasons, a combined approach utilizing video modeled Social Stories appears valid.

<center>Rationale for Proposed Study</center>

Over the past several years, the number of children and youth identified with ASD has increased substantially. Traditionally, the prevalence of autism has been reported to be 4 to 6 per 10,000 children (Lotter, 1967). However, recent statistics suggest that the prevalence may be considerably higher. For example, Scott, Baron-Cohen, Bolton, and Brayne (2002) report the overall prevalence of ASD to be 57 per 10,000 children. When considering only higher functioning individuals, Hyman, Rodier, and Davidson (2001) suggest prevalence rates of HFA/AS to be about 48 per 10,000 children. Despite these figures, it has been argued that such increases encompass the broader diagnostic schema of autism such as HFA/AS and PDD-NOS, and should not warrant heightened awareness for a change in the incidence of ASD. However, when separating the effects of a broadened spectrum of dysfunction, the prevalence rates across the autism spectrum remain remarkably high.

In addition to epidemiological increases, the U.S. Department of Education (USDOE) reports that the number of children with a diagnosis of a ASD served under the Individuals with Disabilities Education Act (IDEA) has increased 1,354% between 1991 and 2001 (USDOE, 2003a). When increases are examined at state levels, increases in services for children with ASD reportedly range from 10% (e.g., Massachusetts) to 48,600% (e.g., Illinois). In round terms, for every two children with ASD registered through IDEA in 1991-92, there were roughly fourteen registered in 2000-2001. Unfortunately, no information regarding the percentage of students receiving services

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specifically for HFA/AS was found, suggesting that there may be a large unserved student population given the higher prevalence of HFA/AS (Safran, 2001).

Given these data, it is likely that educators and student support personnel increasingly will be called upon to restructure services to better cater to children with this unique profile of severe social and communication difficulties in the presence of cognitive and language strengths. Unfortunately, the most appropriate method to incorporate social skills training in classrooms for children with HFA/AS has received little attention in educational literature. Although there has been a growing body of research on the treatment efficacy of social skills interventions in clinic based samples, there is a dearth of studies that examine the applicability of similar treatment approaches in classrooms. Given the recent urgency for educators, 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. A small comparative study of a combined intervention approach applied to the educational setting is desirable because it: (a) addresses the research to practice gap, and (b) contributes knowledge in the area of program design and intervention implementation for children with HFA/AS.

Purpose

With the increased use of inclusive practices in schools, and with the prevalence of HFA/AS increasing at a substantial rate, it is necessary to begin researching approaches to help children with HFA/AS develop greater social communication skills. With greater awareness of the social difficulties of children with HFA/AS comes greater knowledge in developing appropriate intervention strategies. Thus far, video modeled

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Social Stories appear to hold promise as a logical and beneficial intervention to diminish the qualitative differences that make children with HFA/AS so conspicuous. However, research on social skills interventions with children with HFA/AS is limited, and research on video modeled Social Stories with children with HFA/AS currently is nonexistent. The purpose of the proposed study is to examine the effectiveness of video modeled Social Story interventions on the social communication skills of children with HFA/AS. This study will expand the current body of research in this area by: (a) employing a means of experimental control, (b) probing for generalization; (c) incorporating indices of treatment efficacy; and (d) examining the acceptability of the intervention. In addition, this study will add support for the use of intervention approaches that can be used by educators in applied settings with children and youth with HFA/AS

Research Questions

The following questions will be examined:

1. Does an intervention program consisting of video modeled Social Stories increase the frequency of identified social communication skills of students with social impairments?

2. Do intervention effects maintain following the intervention?

3. Do intervention effects generalize to other settings?

4. Do participants demonstrate clinically significant increases in social communication?

5. Do participants demonstrate increases in collateral social interaction skills?

6. Do teachers value video modeled Social Stories as acceptable interventions?

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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 [APA], 2000). 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 (APA, 2000). 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 (APA, 2000). 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.

Higher-Functioning Autism (HFA)

There are currently no explicit diagnostic guidelines for HFA, and controversy remains whether AS and HFA actually differ or only differ by severity. Currently, areas of controversy relate to: (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).

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Pervasive Developmental Disorder (PDD)

PDDs are a broad diagnostic category that describes 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 (APA, 2002). 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 of Mental Disorders, Fourth Edition—Text Revision* (DSM-IV-TR; APA, 2000), 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.

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 communication

Social communication is a broad category that can be used to define social interactions. Communication includes identifying social cues (visual or auditory), initiating conversations, maintaining 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.

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Chapter II

Review of Literature

Chapter II is dedicated to a review of the literature relevant to this study and covers the history and characteristics of children with High-Functioning Autism (HFA)/Asperger's Syndrome (AS), recommended avenues for social skills interventions, a description and review of the relevant literature related to Social Story interventions and video modeling, and the predicated effects of the use of a combined social skills intervention for children with HFA/AS.

Historical Perspective on HFA/AS

Kanner's Autism

In 1943, Leo Kanner, a Baltimore child psychiatrist at Johns Hopkins, made his first historic publication describing the clinical description of 11 young children with a pattern of abnormal behavior. Kanner emphasized the solitariness of these children, despite the presence of others, as a pervasive lack of interest in social relationships. He described these children as aloof and caught up in restricted, repetitive, stereotypic movements, noises, and routines. Further, he described these children as lacking the ability to adapt to novel environments and insisting on sameness. Finally, he said these children displayed language characterized by echolalia (the echoing of other's speech), pronoun reversal, and literalness, if language developed at all (Klin & Volkmar, 1999; Wing, 1991). Captivated by the children's all-absorbing fascination with the inanimate

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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*.

Kanner pointed out that these children had a number of characteristics in common. Later, expanding upon Kanner's original descriptions, Kanner and Eisenberg (1956) organized the core features of the disorder into five diagnostic criteria based upon the manifestation of clinical phenomena that had been observed. These essential features later formed the foundation for the current diagnostic criteria officially recognized in both the *Diagnostic and Statistical Manual of Mental Disorders*, *Fourth Edition—Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000) and the *International Classification of Diseases* (ICD-10; World Health Organization, 1992). The essential features of Kanner and Eisenberg's original diagnostic criteria for infantile autism included the following:

1. Individuals display an "extreme detachment from human relationships (pg 556)." Socially, these individuals appear aloof and indifferent to other people, especially other children.

2. Individuals possess an "anxiously obsessive desire for the preservation of sameness (pg 557)." Insistence on sameness is primarily evidenced by a resistance to change in daily routine, activities, or arrangement of objects.

3. Individuals possess "a fascination for objects, which are handled with skill in fine motor movements (pg 557)." The use of objects is reserved primarily for repetitive activities (e.g., spinning a wheel) or for no obvious purpose.

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4. Individuals often exhibit "mutism, or a kind of language that does not seem intended to serve interpersonal communication (pg 556)." However, there appeared to be several distinctions among criteria for those who did develop language. First, those who developed basic language skills often displayed immediate or delayed echolalia and/or reversal of pronouns. Second, individuals who displayed some level of language comprehension tended to make literal interpretations of the meaning. Finally, those individuals with more advance speech tended to be long-winded and pedantic in their utterances.

5. Individuals exhibit "the retention of an intelligent and pensive physiognomy and good cognitive potential manifested, in those who can speak, by feats of memory or, in the mute children, by their skill on performance tests (pg 557)." Special skills and/or talents are frequent and failure on intelligence tests or subtests is explained as a lack of cooperation.

While these five criteria formed the foundation for the definition of autism, Kanner also described other abnormalities associated with the disorder. Specifically, Kanner (1973) noted that individuals with autism may also demonstrate: (a) impairment in the nonverbal aspects of communication manifested by limited facial expression and eye contact, (b) monotonous or peculiar vocal intonation when language is present, (c) odd responses to sensory stimuli, (d) stereotyped movements of limbs, (e) wide variability in the development and use of gross motor skills, and (f) wide variability in cognitive functioning. Despite these additional clinical features, Kanner did not include them in the list of essential diagnostic criteria due to the variation in functioning he had

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observed across many individuals with autism. In fact, Kanner (1973) noted that such variation only reflected "the frequently apparent perplexities of nosological nomenclature (pg.79)." That is, Kanner believed that despite our best efforts to maintain distinguishing characteristics of disorders, it remains difficult to classify individual variability of symptoms into precise categories. Even our most contemporary definitions used for diagnosing autism appear to embrace Kanner's viewpoint regarding variability in functioning. Specifically, the current definitions of autism officially used by both the DSM-IV-TR and ICD-10 emphasize the importance of impairments in social interaction and communication and the presence of repetitive stereotyped routines (see Appendix A). However, most professionals working with individuals with ASD would agree that such additional abnormalities/difficulties exist.

Asperger's Discovery

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. In his descriptions, Asperger emphasized the following characteristics (as listed in Wing, 1998b):

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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).

Unlike Kanner, Asperger did not identify specific criteria for the diagnosis of his syndrome. In fact, Asperger made subtle changes to his descriptions of individuals over the years. For example, in 1944, Asperger specified that his syndrome could be found in individuals of all levels of intelligence, including those with mental retardation. However,

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in a later paper, Asperger (1979) emphasized the high intelligence and highly circumscribed interests of his patients. In addition, Asperger stated that his patients developed highly grammatical speech at age expectancy. These later descriptions currently differentiate autism from AS. In fact, AS has come to be associated with individuals under the autism spectrum who possess normal or high levels of intelligence and language skills, but demonstrate social and behavioral abnormalities that are less severe than those of classic autism (Wing, 1991). Given such variations in ideas concerning the parameters of AS, the only essential diagnostic criteria currently used in the DSM-IV-TR is a lack of significant delay in language or cognitive development (see Appendix B).

Kanner's and Asperger's Viewpoints Compared

Both Kanner and Asperger highlighted the same types of deficits in their patients (see Table 1). Although the descriptions of both authors were strikingly similar, there are some differences worth noting. Specifically, Asperger noted the idiosyncratic areas of "special interest" that were much of a focus in the child's life, awkward and clumsy motor skills, and difficulties in understanding social interactions. Although Asperger described his patients as being socially isolated, he emphasized that they were aware of the existence of others, but approached social interactions in odd or inappropriate ways (Wing, 1991). Despite these apparent differences, Asperger's descriptions remained limited to Germanic writings until Lorna Wing's influential review in 1981.

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Table 1

Similarities of Deficits Described by Kanner and Asperger

1.	Social isolation and lack of interest in the feelings or ideas of others.
2.	Impaired nonverbal aspects of communication (e.g., eye contact)
3.	Impaired use of purposeful communication (if developed for Kanner).
4.	Repetitive pattern of activities.
5.	Odd responses to sensory stimuli (e.g., hypersensitivity to noise)
6.	Special abilities including rote memory and skill with numbers.

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 autism as a spectrum of disorders that included children who did not meet criterion for autism but still presented with clear social impairments (Kugler, 1998). Upon first appearance of Asperger's original descriptions, some clinicians immediately adopted the position that the two syndromes were different in nature. For example, Van Krevelen (1971) identified a list of clinical features that, in his opinion, made it clear that autism and AS were entirely different disorders. Most notably, was his viewpoint that individuals with autism suffered from a psychotic process, whereas individuals with AS suffered from a personality disorder (Wing, 1991). Such a distinction was further expanded to suggest that individuals, who fit Asperger's descriptions, although strikingly similar to autism, never displayed the essential features of autism as described by Kanner (e.g., impaired language development, lack of emotional responsiveness). Instead, individuals with AS more closely resembled those with schizoid personality disorders (e.g., Nagy & Szatmari, 1987; Wolff & Barlow 1979; and Wolff & Chick, 1980). Conversely, others have argued for the close relationship between autism and AS, and

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suggest that both disorders should be considered the same, differing only by a matter of degree (e.g., Gillberg & Gillberg, 1989; Schopler, 1985). This is especially true when considering individuals with HFA.

Such debate regarding the differences and/or similarities between HFA and AS remains today. In recent years, a myriad of publications have been devoted to further study the distinction between HFA and AS, or lack thereof. Most of these publications focus on studies reviewing the disparity in neurocognitive aspects and profiles between children with HFA and AS (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 HFA and AS. Although the advancements in neuropsychology are important, they are beyond the scope of this review, and whether HFA and AS can be viewed as separate disorders remains to be answered within that domain.

Contemporary Viewpoints

Overall, HFA/AS may involve the same fundamental symptomatology, differing only in degree or severity, and the debate of whether there is a need for two distinct diagnostic terms is ongoing. HFA/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 usually milder than that seen in classic autism, and (c) engage in unusual patterns of interest and unique stereotyped behaviors,

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especially the tendency to over focus on certain topics or subjects of interest (Bauer, 1996; Klin, & Volkmar, 1999; Kugler, 1998; Prior, Eisenmajer, Leekam, Wing, Gould, Ong, & Dowe, 1998). Children with HFA/AS generally have normal to above normal cognitive abilities (sometimes in the superior range). In addition, children with HFA/AS often demonstrate language function that is generally stronger than that in other PDDs, but often is unusual in pragmatic ways (Bauer, 1996; Klinger & Dawson, 1996; Landa, 2000). These cognitive and language differences present a diagnostic pattern that is different from that observed in classic autism.

In sum, HFA/AS is characterized by deficits in social interaction and stereotyped behavior patterns, yet is not associated with clinically significant deficits in cognitive development. Furthermore, while language often develops, it is generally not used for communicative purposes, or is used in inappropriate ways. Although consideration of the language and behavioral issues are important for any intervention for children with HFA/AS, the focus of this review will be a discussion of the social sequelae of HFA/AS, and the research that is available to support the sequence of social dysfunction.

<center>Social Impairments in Children with HFA/AS</center>

As is the case with all disorders under the PDD continuum, HFA/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 (ASD), Wing (1998a) summarized the ways social interactions are impaired. Impairment in social interactions can vary, depending on the severity of the dysfunction, but Wing (1998a) divided these impairments into three

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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 make, 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.

Individuals with HFA/AS display many of the characteristics of the triad of impairment described by Wing. With regards to social impairments, children with HFA/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).

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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 HFA/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 HFA/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 HFA/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 HFA/AS may have difficulty understanding how their own actions (e.g., talking excessively about trains) may affect the thoughts of others around them.

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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, 2000). 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 HFA/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.

Challenge to Educators

During the past decade, the number of children and youth with ASD has increased approximately 173%, making ASD the fastest growing developmental disability in the U.S. (Autism Society of America, 2003). Traditionally, the prevalence rate of autism has been reported to be 4 to 5 per 10,000 children (Fombonne, 1999). However, recent statistics suggest that the prevalence of ASD may be considerably higher than previously suspected. For example, Hyman, Rodier, and Davidson (2001) suggest prevalence rates for ASD to be about 60 per 10,000 children. Similarly, Scott, Baron-Cohen, Bolton, and Brayne (2002) report the prevalence of ASD to be 57 per 10,000 children. Despite these figures, it has been argued that such increases encompass the broader variants of autism such as HFA/AS and PDD-NOS, and should not warrant heightened awareness for a change in the incidence of the disorder. However, when separating the effects of a broadened spectrum of dysfunction, the prevalence rates across the spectrum remain remarkably high. For example, a report from the Center for Disease Control for Brick Township, New Jersey, reported a prevalence rate for autism of 40 per 10,000 and up to 67 in 10,000 if children with PDD-NOS and AS were included in the figures (CDC,

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2000). Other age-specific prevalence studies have estimated the prevalence of HFA/AS from 8.4 per 10,000 in preschool children (Chakrabarti & Fombonne, 2001) to 71 per 10,000 children ages 7-16 (Ehlers & Gillberg, 1993).

Given epidemiological increases, state departments of education also have reported increases in the number of students with ASD (National Research Council; NRC, 2001). Such increases have lead to significant referrals for special education services for children with ASD. In fact, the U.S. Department of Education (USDOE) reports that the number of children with ASD served under the Individuals with Disabilities Education Act (IDEA), has increased 1,354% between 1991 and 2001, while students served in all other disability categories increased by only 28.4% (USDOE, 2003a). When these data are examined at state levels, some states have evidenced increases in services for children with autism ranging from 10% (e.g., Massachusetts) to 48,600% (e.g., Illinois). In round terms, for every two children with autism registered through IDEA in 1991-92, there were roughly twelve registered in 2000-2001. Unfortunately, no information regarding the percentage of students receiving services specifically for HFA/AS was found, which suggests the potential of a large unserved student population (Safran, 2001). With this in mind, developing and implementing effective programming for children with HFA/AS becomes an auspicious challenge for special education.

The challenge of assisting students with HFA/AS in schools is twofold. First, the most appropriate method to incorporate social skills training for children with HFA/AS has received little research attention (Quill, 1995; Rogers, 2000). Although there is a growing body of literature on interventions for individuals with ASD that offers

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recommendations for educators, few studies have systematically addressed the efficacy of social skills interventions with purely higher-functioning samples of children with ASD. Second, recent standards of practice presented in the reauthorization of the Individuals with Disabilities Education Act in 1997 (IDEA 1997; P.L. 105-17) have changed. When IDEA was reauthorized in 1997, Congress included a number of changes in IEP requirements to emphasize the necessity of improving educational outcomes. Such changes included the incorporation of measurable goals, a description of the methods by which a student's progress is measured, and procedures to revise goals if a student fails to make progress. In addition, the 1997 reauthorization included references regarding broad practices that pertain to instructing students with ASD, including an emphasis on functional outcome-based education, greater access to the general curriculum, a push for functional behavior assessment (FBA), and the creation and implementation of positive behavior support (PBS) interventions (NRC, 2001). More recently, the 2004 reauthorization, now called the Individuals with Disabilities Education Improvement Act (IDEIA; P.L.108-446) strongly adheres to the theme of using effective interventions based on rigorous scientific research.

Related to increases in the number of students with ASD in school systems and changing standards of practice for student services personnel, case law pertaining to the education of students with ASD has increased significantly. Most of this litigation has focused on procedural and substantive violations pertaining to students with ASD as outlined in the 1997 amendments of IDEA. Specifically, common violations resulting in due process hearings have included failure to: (a) provide functional programming that results in student progress, (b) collect meaningful data to document student progress, (c)

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maintain a continuum of placement options, and (d) provide instruction and support in learning new behaviors (Yell, Katsiyannis, Drasgow, & Herbst, 2003). Such charges against schools and subsequent due process hearings are likely to continue, given the complexity of HFA/AS combined with standards of practice that emphasize effective education documented by measured progress. Therefore, it is necessary for school systems and individual schools to facilitate the development of intervention practices and service delivery models that emphasize the evaluation of outcomes for students with HFA/AS.

<div align="center">Directions for Intervention</div>

The critical information on ASD, along with noted policy changes, make it now necessary to evaluate educational interventions with samples of children with HFA/AS. With the projected increase in the number of students with HFA/AS or higher functioning Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), it is imperative that educators and other student support personnel be mindful of interventions that will benefit these children with severe social weaknesses despite their cognitive strengths.

As the challenge of educating children with HFA/AS increases, the challenge of providing relatively efficient and cost-effective school-based interventions increases. For this review, two strategies are offered as both time and cost efficient that lend themselves to increasing the social skills of children with HFA/AS. One suggestion to improve the social integration of children with HFA/AS that has been suggested repeatedly in recent years is the use of Social Stories. A second, and relatively new, strategy that appears to have potential for teaching social skills to children with HFA/AS is video modeling. An

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in-depth review of both strategies follows and relevant research pertaining to social skills
follows.

Social Stories

A Social Story is an individualized short story that can be used to assist
individuals with ASD in interpreting and understanding challenging or confusing social
situations (Gray, 1997). The norms for behavior in a targeted context, the perspective(s)
of others, and the specific steps for implementing the appropriate social skill(s) are
instructed and modeled through a short written story with picture cues. 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). Essentially, a
Social Story enhances an individual's understanding of social situations and,
subsequently, provides instruction by explaining an appropriate behavioral response that
can be practice by the individual. Subsequent social interactions allow for the repeated
practice of the described behavioral response cue and a new social behavior can be
learned. In this sense, the story itself becomes a "how to" book for initiating, responding,
and maintaining appropriate interactions for individuals with ASD. 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 &
Jonker, 1994) appear in Appendix C.

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Rationale behind Social Stories. Social Stories are based on the growing consensus among researchers that children with ASD 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, 2000). That is, individuals with ASD demonstrate significant difficulty identifying the behaviors, beliefs, and intentions of others. The logic follows that such impairments often lead to deficits in social communication such as following the conventions of maintaining a topic when speaking. Given these deficits, 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: "understanding the lesson, and 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 (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

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interventions generally involve the process of role-plays and modeling with same-aged peers. However, due to their inability to "mind-read," children with HFA/AS may not fully understand the content of these lessons, or, more commonly, become threatened by the presentation of the lesson. Instead, children with HFA/AS may 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 HFA/AS. Under these circumstances, the child with HFA/AS may be unable to process, and later use, the information provided because of the highly social nature of its presentation. These circumstances are perhaps reason why limited generalization of social skills training for children with any autism spectrum disorder occurs.

Developing a Social Story intervention. Gray (1995) outlined four basic steps, (see Table 2) in the development of a Social Story intervention. First, the development of a Social Story involves targeting a specific problematic social situation that the Social Story will have as its focus. This target situation can be a specific social skill, or a situation that has continued to be difficult for a child despite adequate interventions or environmental accommodations (Gray, 1995). Once a target situation is identified, the second step involves identifying the salient features of the context or setting (e.g., where a situation occurs, who is involved, how long it lasts, how it begins and ends, what occurs, etc.). Specifically, through direct observations and interviews with caregivers and

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teachers, information is gathered pertaining to the function and/or maintaining features of the inappropriate, or nonexistent, behavior(s). In addition, information is gathered regarding the child's strengths and weaknesses, as well as his/her perspective on the targeted situation (Gray, 1995). 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 are difficult to determine. After gathering data on the individual's behavior, the third step involves sharing this information with the target child and other relevant individuals (e.g., teachers). Finally, this information is used to generate a Social Story.

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Table 2

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

Step	Description
1. Target a Social Situation	Identify a problematic or potentially problematic social situation.
2. Gather Information	Gather data relative to the target child's interests, abilities, impairments, and factors motivating the current behavior. 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.
3. 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.
4. Support New Social Skill	Generate the specific social skill, and related behavioral steps necessary to successfully manage the target situation. Create 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 on Gray (1995) 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.

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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 information.

6. *Use photographs, hand-drawn pictures, or icons.* Pictures are used to enhance student understanding (this is especially true for lower functioning

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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. Fading 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.

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Guidelines for writing Social Stories. Social Stories must be written with regard to the student's comprehension level (Gray & Jonker, 1994, 2002; Gray & Garand, 1993), and are generally comprised of multiple sentences of four basic types: (a) descriptive, (b) directive, (c) perspective, and (d) affirmative (Gray & Jonker, 1994, 1995; Gray, 1997, 1998, 2002). In addition, Gray (2000) has suggested additional sentence types that may be used in a Social Story: control and cooperative. Although these last two types of sentences are not used as frequently as the basic sentence types, they represent important ideas that may impact the success of a Social Story intervention. The types of sentences and their identified purpose are summarized in Table 3.

Table 3

Social Story Sentences and Their Identified Purpose

Sentence Type	Purpose
Descriptive	Begins the Social Story by defining the salient features of the situation.
Directive	Individualized statements of desired behavior(s).
Perspective	Describes the reaction and feelings of others in the target situation.
Affirmative	Expresses shared beliefs of a given culture.
Control	Aids in understanding abstract situations through use of nonhuman analogies.
Cooperative	Identifies who and how help will be provided.

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."

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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 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 & Jonker, 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.").

Affirmative sentences immediately follow a descriptive, directive, or perspective sentence and enhance the meaning of these statements (Gray, 2002). Generally, affirmative sentences express a commonly shared value or opinion within a given culture. For example, a Social Story explaining the importance of using playground equipment may include the directive sentence, "One child slides down the slide at a time." Immediately following this statement is an affirmative sentence that may reference a

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shared rule such as, "This is a safe thing to do." In this way, affirmative sentences can be used to stress an important point, reference a rule or law, or reassure the individual reading the story.

Control sentences are written by the student and enable him or her to identify strategies to 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 an 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). Control sentences can be very difficult to create, and are often not included in a Social Story.

Cooperative sentences identify what others will do to assist the student (Gray, 2002). For example, in a toileting story, a cooperative sentence may read, "My mom, dad, and teachers will help me as I learn to use the toilet." In this way, cooperative sentences remind parents, peers, and/or professionals of their role in the success of the person reading the Social Story, and ensure consistent responses.

Gray (1994, 2002) suggests using a balanced ratio of sentences that appear in the entire Social Story. There are two *Social Story Ratios* outlined by Gray (2002). The *Basic Social Story Ratio* consists of two to five descriptive, perspective, and/or affirmative sentences for every directive sentence in the story (Gray, 2002). The *Complete Social*

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Story Ratio is similar to the basic ratio but incorporates control and cooperative sentences. As a rule of thumb, it is customary for each complete ratio to have two to five descriptive, affirmative, or cooperative sentences for every directive or control sentence in the story (Gray 2002). Within both of these ratios, the emphasis of the story is to describe more than direct (Gray, 1998, 2002).

Aside from sentence structure, Social Stories usually 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, 2002). 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 ASD often make highly literal interpretations of statements (Kanner, 1943), regardless of the absurdity that may be apparent. Gray and Garand (1993) provide 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

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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).

   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 recorded onto a tape along with a beep that is used to indicate when the child is to turn the pages of the Social Story. Once the child is taught

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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 videotape(s) (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 followed by frequent progress monitoring (Gray, 1998).

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. Progress monitoring should include quantitative information (e.g., frequency counts, time-sampling recording) regarding the student's progress. In addition, qualitative information regarding any difficulties with the story is necessary to ensure that the Social Story is appropriate for the contextual variables present in the story itself. Understanding where a Social Story may be weak and needs to be improved is essential for the intervention to be

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successful. Without sufficient data collection, it is difficult to ascertain the relative effectiveness of a Social Story intervention.

Effectiveness of Social Stories. A review of the published research available on both PsycINFO and ERIC databases regarding Social Story interventions for children with ASD yielded twelve studies. All of these studies utilized single-subject research designs to test the effectiveness of Social Stories. Two studies found in this search, Rowe (1999) and Smith (2001), were not included in this review due to the fact that both of these studies failed to report specific behavioral outcomes. Both of these studies provide anecdotal information regarding the effects of Social Stories on children with ASD. However, without detailed information regarding methods and specific outcome data found in each of these studies, it is difficult to determine any level of experimental control.

From the original search, ten studies were included for a detailed review. Two of these ten studies (Norris & Dattilo, 1999; Swaggart, et al, 1995) failed to demonstrate experimental control because they used an AB single-subject research design. Although included in this review, studies that utilized AB designs were considered pre-experimental because they do not permit the assumption of a functional relationship (Kazdin, 1982). The remaining eight studies employed a level of experimental control necessary to provide sufficient information that the Social Story intervention resulted in observable changes in target behavior(s) (i.e., functional relationship). However, only two of these studies (Sansosti & Powell-Smith, in press; Thiemann & Goldstein, 2001) referenced consideration of programming for generalization (e.g., natural contingencies, multiple environments) as suggested by Stokes and Baer (1977). Additionally, only two

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studies (Scattone, Wilczynksi, Edwards, & Ravian, 2002; Thiemann & Goldestein, 2001) used methods to assess the social validity of the treatment. All of the studies that appear in this review demonstrate preliminary efficacy of Social Story interventions with a variety of children with ASD.

Two studies reviewed used an AB, pre-experimental design. The first of these studies used a combined intervention of Social Stories and behavioral social skills training to teach appropriate social behavior to three children within the spectrum of moderate to severe autism (Swaggart, et al, 1995). Participants in this study fell within the spectrum of having moderate to severe autism and manifested significant impairments in cognitive ability and expressive communication skills. Each of the participants was included in this restrictive self-contained setting due to their intense aggressive behavior(s). Environmental and task analyses of the participants' aggressive behaviors 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).

Following the identification of the targeted behaviors for the participants, Social Stories were developed following 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. The Social Stories were individually read to the target participants at the beginning of each day. Furthermore, verbal

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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.

Event recording data were gathered relative to each participant's targeted social behavior. Unfortunately, no data were reported regarding inter-observer agreement for observations. Results following Social Story interventions indicated trends in the desired direction for each participant. The first participant demonstrated an increase of 50% (from 7% to 57%) in appropriate social greetings. In addition, her aggressive behavior decreased (from 9% to 0%). The second and third participants demonstrated similar patterns, indicated by an increase in sharing behaviors (occurring 22% and 35 % of opportunities, respectively) and a decrease in aggressive behaviors (occurring 56% and 35% of opportunities, respectively).

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. 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 this study 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.

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In the second AB design study, Social Stories were also used to increase the appropriate social interactions of an 8-year-old girl with autism who attended an inclusive second-grade classroom (Noris & Dattilo, 1999). 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

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respectively. Occurrence reliability was calculated on all three types of interactions and ranged from 89% to 100%.

The 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) were recorded for 8- to 10-minute periods. Data were collected on the frequency of the participant's social interactions during lunchtime. Inter-rater agreement was sufficient ranging from 88% to 100% across baseline and intervention conditions. Results of the study demonstrated a delayed, but positive, effect on decreasing the participant's inappropriate social interactions during lunch. While highly variable, the data revealed a 48% decrease in inappropriate social interactions. However, the level of appropriate social interactions and absence of social interactions did not change following the introduction of Social Stories. Taken together, these results suggest that Social Stories were effective for reducing behavioral excesses while limited in increasing the acquisition of social skills.

While it appeared that the Social Story intervention had an effect on the participant's social interactions during lunchtime, 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

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practiced during lunchtime. These factors, combined with the pre-experimental design utilized in the study, mean that threats to both the internal and external validity of the study cannot be ruled out.

Three additional studies that utilized an ABAB/Reversal design were reviewed. The first of these studies used a Social Story intervention to reduce tantrum behavior in an individual with autism (Kuttler, Myles, & Simpson, 1998). 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 experimental design, observational data were collected on the frequency of the participant's tantrum behaviors both during treatment and in the absence

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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 due to the failure to include any social validity measures regarding the impact of the intervention.

Similarly, 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 5-year-old boy with 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

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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 of the Social Stories were read twice a day, as well as during times when an adult was to engage in another conversation in the participant's presence. 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. Inter-observer agreement was excellent, averaging 96.10% throughout the intervention.

Using an ABAB experimental design, observational data were collected on the frequency (event recording) of the participant's tantrum behaviors both during treatment

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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 ABAB/reversal 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 due to the failure to include any social validity measures regarding the impact of the intervention.

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Social Stories have also been used in the home to decrease socially inappropriate and undesirable behaviors in a 7-year-old boy with AS (Adams, Gouvousis, VanLue, & Waldron, 2004). The participant displayed frequent inappropriate and distracting behaviors when the parents attempt to help him with homework. Specific target behaviors included crying, screaming, falling to the floor, and hitting during homework time. A functional analysis of the participant's behaviors revealed that the four targeted behaviors resulted from frustration. These frustration behaviors occurred most frequently when the participant did not understand the homework assignments and was not able to communicate to ask for assistance. A subsequent Social Story was developed to address the four target behaviors. The Social Story addressed the completion of homework through a description of the desired replacement behaviors to increase communication when frustrated (e.g., "I can tell mom and dad that I don't understand"). Because this study was completed in the home, homework sessions were videotaped during baseline and intervention phases. These videotapes were observed and coded by two of the investigators. Interobserver reliability checks occurred during 38% of all coded observations. Occurrence reliability was 90%.

Using an ABAB design, data were collected on the total frequency of the participant's frustration behaviors during homework times. During each of the four phases there were 12 sessions, resulting in 48 samples of behavior across conditions. Results of this study, although highly variable, demonstrated decreases in the participant's frustration behaviors. Overall, an observed decrease in the frequency of crying, screaming, falling, and hitting behaviors across conditions was 48%, 61%, 74%, and 60% respectively. In addition to these observational data, qualitative information was

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gathered from the participant's teacher to determine if there were any carryover effects of the targeted behaviors to the classroom setting. According to the participant's first-grade teacher, the behaviors targeted at home appeared to decrease in the classroom without direct intervention. The teacher noted that prior to the intervention the participant would hit his desk, cry out, and fall to the floor when presented with work. In contrast, after the Social Story intervention, the teacher reported that the participant would ask for help in appropriate ways.

The results of the Adams et al (2004) study demonstrate further support for the use of Social Stories. In addition, this study adds significant information to the growing literature on Social Stories in several ways. First, this study demonstrates the effectiveness of a parent directed intervention. Second, qualitative information gathered from the participant's teacher demonstrated carryover effects from the home to the classroom setting, a finding that has not been observed in previous research. Despite these benefits, limitations of this study exist. Specifically, the authors point out that the parents were inconsistent in their helping with the intervention and dealt with the participant's inappropriate behaviors in a variety of ways. This may have led to higher levels of inappropriate behaviors during the intervention phases of the study and/or contributed to the highly variable nature of the intervention data. Further parent training and assessment of treatment integrity may have been helpful.

Musical Social Stories have also been used to improve the social behavior of four elementary school boys with autism between the ages of 6 and 9 years (Brownell, 2002). Each of the participants were partially integrated in general education classrooms. Target behaviors included decreasing movie and television verbalizations (first participant),

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teacher instructional repetitions (second participant), and loud vocalizations (third and four participants). For each participant, printed and musical Social Stories were created according to Gray's (1998) recommendations. The musical Social Stories comprised of an original song that incorporated the sentences of the Social Story as lyrics. Social Stories were implemented in a separate room by the investigator. Following the presentation of the Social Story, the participant returned to class and teachers or aides collected frequency data of target behaviors during classroom activities. Data were collected for 5 days for each condition. Inter-observer agreement ranged from 86% to 94% across all participants. Treatment integrity and social validity were not assessed.

Through an ABAC/ACAB counterbalanced design, the difference between traditional print-based Social Stories and their musical equivalent were investigated. Results were highly variable, but indicated that the both the traditional and musical Social Stories were effective in decreasing the target behaviors for all four participants. For two of the participants, the frequency of their target behaviors was lower during the musical adaptation of their respective Social Story. All four participants consistently demonstrated a decrease in target behaviors during the second baseline. This finding suggests that some learning effects occurred following the first implementation of the Social Stories (as should be expected).

The results of the Brownell (2002) study offer further evidence for the effectiveness of Social Stories for decreasing behavioral excesses in children with ASD. Although the use of an ABAC/ACAB experimental design offers experimental control, limitations for this study also exist. First, the design of the musical Social Stories, while highly unique, may limit the acceptance of such an intervention by those

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practitioners/educators not trained, or comfortable, in designing music. Such a consideration is paramount when dealing with issues of treatment integrity. Related to this limitation, social validity was not measured. Therefore, it is difficult to determine if such an adaptation of traditional Social Stories would be suitable for use by educators.

Four studies incorporated a multiple baseline design to measure Social Story effectiveness. The first of these studies used a computer-based implementation to investigate the effects of Social Stories for three elementary-aged boys with autism (Hagiwara & Myles, 1999). Functional assessments were used prior to Social Story development 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 each participant's identified behavior. Each participant operated 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. Hand washing behaviors for the first participant were examined before snack, prior to lunch, and after recess. Likewise, hand washing behaviors for the second participant were examined before going to resource room, before lunch, and after recess. Settings for the third participant included lunch, resource room, and a general education classroom.

Results of Social Story implementation revealed only small improvements in targeted behaviors. For the first participant, hand-washing behavior increased 17% during morning snack, 8% before lunch, and 9% after recess respectively as indicated by level

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change analysis. Data for the second participant revealed similar patterns (8% increase before resource, 9% increase before lunch, and 8% increase after recess respectively). The average duration of the third participant's on-task behavior across lunch, resource room, and general education classroom settings did not demonstrate any consistent changes or improvements.

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.

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

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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 the 10-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. Some generalized treatment effects were observed across untrained social behaviors, and one participant generalized improvements within the classroom. 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. Despite these limitations this research did demonstrate the benefits of using visuals supports within embedded text as an educative approach for children with autism.

A recent investigation presented Social Stories to decrease the disruptive behavior of three children with autism in self-contained special education classrooms (Scattone, Wilczynski, Edwards, & Rabian, 2002). For the first participant, chair tipping defined as

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one leg of the chair breaking contact with the floor was selected as the target behavior. Target behaviors for the second participant included looking inappropriately at females during recess defined as a period of staring for three or more consecutive seconds. For the third participant, disruptive shouting was selected as the target behavior. Subsequent Social Stories were written following Gray's (1998) recommendations. The Social Stories were read aloud by the teacher or the teacher's aide prior to beginning class for the first participant and approximately one hour before recess for the second participant. Because the third participant did not read independently, the teacher read the Social Story to him in the morning prior to the beginning of class. Each student only read the Social Story once per day.

Effectiveness of these Social Stories was assessed using a multiple-baseline across participants design. A partial-interval recording system was used to record the occurrence of each target behavior during 20-minute observations for each participant, measuring the percentage of intervals of occurrence. Inter-observer agreement ranged from 89% to 100% across subjects. In addition, treatment integrity was assessed for 25% of the intervention period using a daily checklist completed by the participants' teacher. Levels of treatment integrity ranged from 91% to 100%. Social validity of the Social Story interventions was also assessed using the Intervention Rating Profile (IRP-15; Martens, Witt, Elliot, & Darveaux, 1985).

Data revealed a reduction in disruptive target behaviors for all three participants as indicated by changes in mean level. The first participant demonstrated a decrease in chair tipping behaviors from 50% to 4.6%. Similarly, staring behavior was reduced from 66.9% to 18.25% for the second participant. Although behavior reduction for the third

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participant was not as dramatic, an 11% decrease in shouting behavior was observed (from 18.15% to 5.1%). Visual inspection of these data also revealed abrupt reductions in the target behaviors for each participant occurring on the first day of the intervention period. Anecdotal observations demonstrated that some of the participants recited the information presented in their respective Social Stories. In addition to these findings, variability of the data was low from baseline to intervention conditions for each participant.

Clearly, the results of the Scattone, et al (2002) study demonstrated positive effects for reducing targeted disruptive behaviors for each participant. Due to the nature of the design and multiple assessments to ensure treatment integrity, only a few limitations exist that may impact the generality of the findings. First, the second participant in this study was already receiving a separate academic intervention to increase on-task behavior. Therefore, it is difficult to assess the degree to which such an intervention contributed to the success of decreasing the staring behavior of this participant. Second, Scattone, et al. (2002) noted that during the observations, teachers referenced each of the participants with their respective Social Stories through verbal prompts. Such teacher behavior, although difficult to control, may have had an influence by creating more opportunities for each participant to practice the skill presented in their respective Social Story. Combined, these treatment interferences make it difficult to isolate the efficacy of Social Stories.

In another study, Social Stories were used to increase the social behavior of three elementary aged children with AS during unstructured activities at school (Sansosti & Powell-Smith, in press). Target behaviors were identified for each participant based on

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functional assessments. For the first participant, sportsmanship defined as instances in which the participant actively treated teammates, opponents, and/or coaches with respect was selected as the target behavior. Target behaviors for the second participant included maintaining conversations defined as a contribution to a reciprocal conversation with another peer without walking away. For the third participant, joining in play activities was selected as the target behavior. Three Social Stories (one per participant) were designed to address the identified target behavior for each participant. The Social Stories were read twice a day at home. Specifically, each participant read and reviewed their respective social story with their caregiver(s) at the beginning (e.g., before going to school) and end of each school day (e.g., returning home from school). Subsequent data collection occurred during school hours.

Using a multiple-baseline across participants design, data were collected on the percentage of intervals each target behavior occurred. A partial-interval recording system was used to record the occurrences of each target behavior during 20-minute observations for each participant. In addition, peer comparison data were gathered to compare rates of behavior. Data were collected three times per week during unstructured school activities (e.g., recess). Inter-rater reliability checks occurred during 20% of the baseline condition and 25% of the intervention condition, ranging from 80% to 100% across subjects.

Increased social behaviors were observed in two of the three participants included in the study. Specifically, improved and more consistent rates (less variability) of targeted social behaviors were observed. In addition, the two participants approached levels of performance that were similar to, or at sometimes greater than, their comparison peers across target behaviors. Lack of positive findings for the third participant was

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hypothesized to be due to lack of treatment integrity or a poorly designed Social Story. Unfortunately, maintenance of target behaviors was not observed over time for any of the participants.

Despite lack of replication of findings with the third participant, the results of the Sansosti and Powell-Smith (in press) study demonstrated positive effects for increasing social behaviors in children with AS. Not only did this study extend previous findings of Social Story research, but also offered a unique contribution to the research literature by employing peer comparison data. To date, no known studies have employed such a comparison to examine the clinical effectiveness of the intervention. However, because the intervention was implemented in the home, it is difficult to assess to what degree coaching or additional practice was provided by the caregiver(s). With this in mind, additional teaching may have occurred above and beyond the information provided in the Social Story. Thus, it was not possible to identify whether the manner and/or situation the Social Story was read had any impact on the effectiveness of the intervention. Second, social consequences for each participant in their respective environments were not assessed. 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.

Overall, the empirical foundation regarding the effectiveness of Social Stories is gaining strength. While the published research demonstrates positive effects of Social Stories and provides preliminary support that Social Stories are effective approaches when working with individuals with ASD, the results of previous research should be considered with caution. Due to either a lack of experimental control, weak treatment

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effects, or confounding treatment variables in the reviewed studies, it is difficult to determine if Social Stories alone were responsible for durable changes in important social behaviors. Furthermore, only recent studies have begun to incorporate greater experimental control through the use of more rigorous experimental designs (e.g., multiple baseline designs). Thus, it may be premature, based on the current literature, to suggest that Social Stories are an evidence-based approach when working with individuals with ASD. Although the research base is limited, it is likely that the use of Social Story interventions will continue given their relative ease of implementation. Given this, future research regarding the effectiveness of Social Story interventions, as well as combined intervention approaches that utilize Social Stories, is necessary.

Video Modeling

A recent strategy shown to be effective for children with HFA/AS is the use of video modeling. Video modeling involves having the child with HFA/AS watch a videotape of a model engaging in a target behavior to be imitated (Charlop-Christy, Le, & Freeman, 2000). By modeling behaviors on videotape in a purposeful and often discrete manner, the child learns to memorize, imitate, and generalize the behaviors. Video modeling, used as a means to modify, change, or shape behavior, appears to be an appropriate strategy for use at home and school. In addition, it may increase the effectiveness of existing treatment programs by offering multiple exemplars necessary to increase the generalization of skills (Stokes & Bear, 1977).

Effectiveness of Video Modeling. Video modeling represents a new area of research that has recently begun to materialize. To date, six empirical studies relating to the effectiveness of video modeling interventions used with children with ASD could be

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found. Each of these studies utilized a single-subject research design and employed a level of experimental control necessary to attribute changes in target behaviors to video modeling intervention. In addition, generalization of treatment effects was measured in each of these studies. Positive effects were found in each of these studies, demonstrating preliminary efficacy of video modeling interventions with children with ASD.

In one of the first studies, Charlop and Milstein (1989) used video modeling procedures to teach conversational speech skills to three children with autism. All participants (ages 6 and 7 years) were considered to be high-functioning as demonstrated by the presence of some speech and social skills. However, the participants seldom asked questions, engaged in spontaneous speech, or maintained a conversation. Despite numerous efforts to teach conversational skills through traditional prompting and reinforcement procedures, the participants failed to acquire such skills. A subsequent video modeling intervention was designed and implemented.

Videotapes that depicted two adults engaged in a scripted conversation about toys were created for each participant. After several viewings of the video, the participants engaged in the scripted conversation with an adult. During these training sessions, the examiner asked a question and waited for the scripted response from the participant. Edible reinforcers were presented contingently for the correct completion of an entire three-line conversation during training. When criterion for learning was met, generalization of conversational skills was assessed with untrained topics of conversation, new stimuli, unfamiliar persons, and other settings. Using a multiple baseline across subjects design, data were collected on the number of correct responses

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following an examiner led question. Inter-rater reliability was assessed for all sessions with a range across subjects between 97% and 99%.

Results of this study showed that all three participants acquired the scripted conversational speech skills immediately following exposure to the modeling procedure. Importantly, the participants' conversational skills generalized across new stimuli and persons over a 15-month period. In addition, a concomitant increase in question asking and spontaneous response variations was observed. For example, one of the participants frequently elaborated on the topic of conversation and deviated from the original script. Overall, this study demonstrated the rapid effectiveness of using video models to teach conversational skills to children with autism.

A combined intervention of video modeling and reinforcement was used to teach perspective taking skills to three children with autism included in general education classrooms (LeBlanc et al., 2003). The three participants, age 7 to 13 years, participated in three common measures of perspective taking (*Sally-Anne*, *M&Ms*, and *Hide and Seek* tasks). The *Sally-Anne* task required the participants to watch two puppets. Initially, both puppets were present, and the participant saw one of them place an object under a bowl. One puppet departed, and the participant watched the other puppet place the object under a box. The participant then was asked to predict where the departed puppet would look for the object. The *Sally-Anne* task was administered only as a pre-test/post-test. In the second task, the *M&M* task, the participant was shown an oversized box of *M&Ms* and asked what he thought was inside. Then, the box was opened to reveal that only a pencil was inside rather than candy. The participant was asked to predict what another person, who was not present, would think the box contained. *Hide and Seek* tasks were similar to

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the *Sally-Anne* task whereby an object is hidden and then moved after a person is removed from the task. The participant was then required to predict where the person who previous left the room would look for the object upon returning. Participants' responses to both the *M&M* and *Hide and Seek* tasks were used as dependent measures for this study.

For this study, a combined intervention using video modeling and reinforcement was devised. First, an instructional videotape was created to teach the participants how to correctly answer the *M&M* and *Hide and Seek* tasks. The video focused on relevant visual cues (e.g., zoomed-in on the task) and the model explained the strategy (e.g., "he thinks there are M&Ms in the box"). During the intervention phase, the experimenter paused the videotape to have the child respond to perspective-taking questions immediately after the correct response was modeled. Correct answers were rewarded with preferred edible items or stickers. Incorrect responses resulted in a replay of the video.

Using a multiple baseline across two tasks (*M&M* and *Hide and Seek*) for each participant, data were collected on participants' responses. Specifically, participants' responses were scored as pass or fail across baseline, intervention, and follow-up conditions. Variations of the tasks were presented once during baseline and intervention phases. During baseline, all participants consistently failed the primary tasks. Upon implementation of the video modeling and reinforcement intervention, all participants mastered the tasks and demonstrated repeated passing performance with 100% accuracy. In addition, all participants failed the *Sally-Anne* pre-tests. However, two of the three participants passed this task after receiving the intervention for the *M&M* and *Hide and*

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Seek tasks, suggesting generalization of skills. During follow-up, conducted one month after the final training session, two of the three participants passed the tasks.

Clearly this study demonstrates the effectiveness of video modeling. However, the results should be considered with caution for several reasons. First, this study employed multiple treatments (e.g., video modeling and reinforcement) without examining the effects of each of these factors separately. Second, participants were repeatedly tested with the same tasks. Continued testing constitutes an experience that may lead to systematic changes in performance (Kazdin, 1982). Finally, this study only addressed perspective taking. Potentially, it would be more important, and socially useful, to examine the behavioral explanation for the target response. That is, address the importance of understanding the perspectives of others and implement strategies for increasing perspective taking skills in natural social situations.

Charlop-Christy and Daneshvar (2003) also used a video modeling procedure to teach perspective taking to three children with autism enrolled in an after-school behavior management program. Each of the three participants, ages 6 to 9, demonstrated limited social behaviors, often needed to be prompted to play cooperatively with other children, and displayed limited ability to take the perspectives of others. Similar to the LeBlanc et al (2003) study, participants engaged in several perspective-taking tasks. The tasks consisted of the *M&Ms* and *Hide and Seek* (using a plastic zebra, tiger, and pizza for stimulus generalization) tasks used in previous research, as well as a modified *Sally-Anne* task. The modified *Sally-Anne* task was the same as discussed previously, differing only in the subjects used. Specifically, *Bugs Bunny* and *Barney* were used instead of Sally and

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Anne dolls/puppets. The *Bugs Bunny/Barney* task was used only as a pre- and post-test measure.

Separate instructional videotapes were created to teach the participants to correctly answer all of the tasks except the *Bugs Bunny/Barney* task and the stimulus variations (zebra, tiger, and pizza generalization stimuli) for each task. During video modeling, the participants viewed a video that depicted a familiar adult correctly performing the perspective taking task. The actors in the videotape explained their problem-solving strategies and repeated the correct responses. Immediately after viewing the videotape, each participant was presented with a task to solve with an examiner. All participants' responses were videotaped and later coded by two observers. Dependent measures were the participants' correct verbal responses for each task. Interobserver reliability was 100% for all sessions.

A multiple baseline across children and within-child across tasks design was used to examine the effects of video modeling on the accuracy of the participants' responses. Responses were recorded as either pass or fail. In addition, multiple probes were used to evaluate the generalization of skills to untrained stimuli. Results of this study indicated that video modeling not only resulted in improved performance on perspective taking tasks for each participant, but also resulted in generalization across stimuli. Specifically, the first participant demonstrated consistent passing scores following only three exposures to video modeling. In addition, this participant consistently passed all of the tasks using the generalization stimuli (e.g., zebra, tiger, and pizza). Similarly, the second participants exhibited improved and consist performance after six exposures to video modeling, and exhibited stimulus generalization. The third participant showed improved

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accuracy in responding only after one exposure to video modeling. Stimulus

generalization also occurred for the third participant. Aside from these observed

behaviors, all three participants failed the pre-test. Following the video modeling

intervention, two of the three participants passed the post-test and exhibited stimulus

generalization to tasks. The third participant failed to pass the post-test and displayed

inconsistent stimulus generalization.

Results of this study support previous research findings that perspective taking

skills can be taught to children with autism and video modeling is a fast and effective

way of teaching new skills to this population. In addition, this study demonstrates the

effects of video modeling on the generalization of perspective taking skills across stimuli.

These findings also suggest the possibility of teaching other complex social skills to

children with ASD using a video modeling and multiple exemplar training package.

Video modeling has also been used to teach play sequences to a preschooler with

autism (D'Ateno, Mangiapanello, &Taylor, 2003). The participant is this study was a 3-

year-old girl diagnosed with autism who attended a center-based autism education

program. During play activities, the participant frequently engaged in repetitive

manipulation of toys and self-stimulation behaviors. In addition, verbal behaviors (e.g.,

socially interacting with others, self-talk, saying "hello") rarely occurred during play

activities.

Three separate video vignettes using an adult model were recorded to demonstrate

baking, shopping, and tea party play sequences. In each of the videotaped play sequences,

an adult spoke to a doll by reading a script and manipulating stimulus materials (Betty

Crocker baking set, shopping cart with plastic play food, tea party set) according to the

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script. The number of scripted verbal statements and motor responses varied from 10 to 12 statements across the three play sequences. The participant viewed a video depicting one play sequence in a room isolated from the stimulus materials. Exposure to play materials was permitted after a minimum delay of one hour. The duration of each experiment sessions was five minutes or until the participant left the play area for a period of 15 seconds or more. No experimenter-implemented reinforcement, prompting, or correction procedures were used.

Dependent measures in this study included the number of scripted and unscripted verbal statements and the number of modeled and not-modeled motor responses during the baking, shopping, and tea party play sessions. A scripted verbal statement was defined as a verbal statement that matched the statement of the video model while allowing for the omission or substitution of one word. Unscripted verbal statements (novel responses) did not match statements in the video model even when the participant's statement fit contextually with the modeled behavior. Modeled motor responses were defined as motor responses that matched the motor sequence performed in the video model. A not-modeled response was any motor sequence that did not achieve the same outcome on the environment as the modeled response. Interobserver reliability checks occurred during 50% of baseline and intervention conditions for all three play sequences. Occurrence data were calculated separately for verbal and motor responses and ranged from 66% to 100%.

Using a multiple baseline across response categories design, data were collected on the number of the participant's verbal statements and motor responses. Data for scripted verbal responses systematically increased from baseline to intervention

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conditions for the baking, shopping, and tea party play sequences. The frequency of novel verbal responses remained relatively constant across baseline and intervention conditions for each sequence. Similarly, data for modeled motor responses increased systematically from baseline to intervention for all three play sequences while not-modeled motor responses demonstrated little change. Overall, the video modeling intervention led to an increase in the number of both verbal and motor play responses that were modeled for the participant.

The results of this study provide further support for the use of video modeling as a quick and easy procedure to promote prosocial behavior in children with ASD. Furthermore, this study adds to the literature the effects of video modeling implemented in the absence of experimenter-implemented contingencies. That is, previous research has used video modeling in conjunction with experimenter-implemented reinforcement, prompting, or correction procedures that may have created multiple treatment interference and skewed observed results. Despite these contributions, limitations to this study exist. First, follow-up data were not assessed following the fading of video models. Second, no data regarding response and stimulus generalization was presented. Given that novel responding data in this study demonstrated little change from baseline to intervention conditions, it is possible that the use of only one video vignette was not robust enough to promote generalization. The presentation of multiple video models or multiple exemplars depicting several responses as well as different types of stimuli may be necessary to enhance generalization of skills.

Nikopoulos and Keenan (2003) were the first to examine the effectiveness of a video modeling intervention used to promote social initiations in children with autism. A

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total of seven participants, ages 9 to 15 years, who attended a residential school for children with developmental and learning disabilities participated in this study. Of these seven participants, two had a diagnosis of autism, two had a diagnosis of autism with mental retardation, two had a diagnosis of autism with mental retardation and epilepsy, and one participant had a diagnosis of AS. All of the participants demonstrated a lack of social interactions with other children. A subsequent video modeling procedure was created.

Three videotapes were created showing a model and an experimenter engaged in a simple social interactive play in an adapted play setting. The video models were either a familiar adult, a peer, or an unfamiliar adult. In the videos, the model was shown engaging in a simple activity using a particular toy (e.g., trampoline, ball, sand box with toys, tambourines, plastic tea set) with an experimenter. Specifically, the model entered the room, wandered around the room a bit, and then approached the experimenter, taking him by the hand, saying "let's play", and leading him to a particular toy. Each video was approximately 35 seconds in duration and the models' behavior was presented as natural as possible. Together the model and the experimenter played with a particular toy for about 15 seconds. The seven participants were classified into two dyads and one triad. Participants in each group viewed the same videotape throughout the study and each group viewed a different model (familiar adult, peer, unfamiliar adult).

Using a multiple treatment design, each child's behavior was assessed. Dependent measures included latency to social initiation (defined as a verbal or gestural behavior previously viewed on the videotape within 25 seconds of entering the room) and time spent in appropriate play (defined as total time spent engage in play with the

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experimenter). During baseline, play sessions were conducted in the absence of any video presentations. Upon implementation of the video modeling intervention, each participant first watched the videotape and then was taken immediately into a play room by the experimenter. While in the room, the experimenter sat in a chair and made no reference to the video nor provided any specific consequences for behavior. Each participant's behavior was videotaped and subsequently coded according to the response definitions. Interobserver reliability was assessed on 31% of all observations. Average reliability was 98%, ranging from 92% to 100% for each dependent measure. Periodic probes to assess generalization to toys, settings, and peers were also completed for each participant. In addition, follow-up assessments were conducted one and two months post intervention.

Results of this study demonstrated that the video modeling procedure enhanced the social initiation skills of four of the seven participants. Data also demonstrated that video modeling facilitated increased time spent in appropriate play which generalized across toys, settings, and peers. For these four participants, these changes were maintained after the one and two month follow-up period. These results should be considered cautiously for several reasons. First, the results were not replicated across all participants, suggesting that video modeling is only successful for particular children. This may be because the researchers failed to manipulate the influence of the experimenter in the play room. Perhaps greater social initiation would have occurred if other children were used as the play contact person. Second, it is not clear if the toys themselves had any influence on the target behavior. That is, some of the toys used in this study may not have been appealing to the participants and thereby did not stimulate enough interest to promote any social initiations to play with the experimenter. Finally, it

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may be that the limited cognitive skills of the children had a profound impact on these results. Specifically, with exception to one participant, those participants who had a dual diagnosis of mental retardation failed to demonstrate positive improvement following the implementation of the video modeling intervention. Such results may suggest that these participants may not have possessed the cognitive capacity to imitate behaviors depicted by the video model.

In a more recent investigation, Nikopoulos and Keenan (2004) replicated their previous research by implementing a video modeling procedure to teach social initiation and play behaviors to three children with autism. Participants, who were between the ages of 7 and 9 years, demonstrated mild to moderate characteristics of autism and engaged in limited social interactions. As discussed in detail previously, the participants watched a videotape showing a typically developing peer and an experimenter engaged in a simple social interactive play routine. Using a multiple baseline across subjects design, data were collected on latency to social initiation and time engaged in reciprocal play. Inter-rater reliability was sufficient with a range across subjects between 94% and 100%. This reliability occurred during 55% of all experimental sessions.

Results of this study demonstrated increases in both the frequency of social initiations and time engaged in reciprocal play following the implementation of the video modeling procedure. The effects of the intervention were relatively abrupt as indicated by a rapid change in level for each participant following implementation of the video model. In addition, these effects generalized across different toys and were maintained at one and three month follow-up periods. Clearly, these results demonstrate increased support for the use of video modeling. Specifically, this study adds to the growing literature that has

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begun to examine the effects of video modeling on social interactions with children with ASD.

Research has also examined the effects of video modeling compared to in-vivo (traditional live) modeling. Charlop-Christy, Le, and Freeman (2000), compared the effectiveness of video modeling with in-vivo modeling for teaching developmental skills to five children with autism at an after-school behavioral therapy center. For each participant, two target behaviors were selected from his or her curriculum. Then, each task was randomly assigned to either an in-vivo or video modeling condition. In-vivo modeling consisted of the participants observing live models of the target behavior. Video modeling consisted of each participant watching a videotape of models performing the target behavior. Models for both the in-vivo and video modeling conditions were familiar adults who worked as therapists at the after-school program. Data were collected for each participant within each modeling condition and compared across children and across tasks using a multiple baseline design. In addition, generalization probes for each target behavior and measures to assess the time and cost efficacy of in-vivo and video modeling were conducted.

After each participant observed the models, they were tested for acquisition and generalization of target behaviors. For four of the five participants, video modeling led to quicker acquisition of skills than in-vivo modeling. In fact, all five participants showed marked improvements in target behaviors rather rapidly after exposure to video modeling (ranging from 2 to 4 modeling sessions). In addition to quick acquisition, generalization of each participant's target behaviors occurred after presentations of video modeling, but did not generalize after in-vivo modeling. Aside from skill attainment, video modeling

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was found to be more time and cost efficient than in-vivo modeling. Specifically, this study found that a video modeling intervention could be created and implemented in two thirds less time than in-vivo modeling and would be fifty percent more cost efficient.

The available research suggests that video modeling is an effective an efficient technique for teaching children with ASD a number of different behaviors (e.g., independent play, conversational speech, self-help skills). In fact, several advantages of video modeling can be gleaned from the research. First, video modeling appears to result in quicker acquisition of target skills. It is hypothesized that this quicker acquisition is related to the motivating aspects of watching a videotape rather than engaging in a highly involved social learning interaction. For example, video modeling is novel. In addition, video modeling increases attention for the child by capitalizing on visual supports. These characteristics are especially relevant for individuals with HFA/AS who rely heavily on visual information when learning (MacDuff, Krantz, & McClanahan, 1993). Second, video modeling increases the generalization of skills across stimuli, persons, and settings. Increasing the generality of skills has been an enigma in the field of autism (NRC, 2001). However, the use of videos appears to have promulgated a new area of research for not only increasing skills for children with HFA/ASD, but also maintaining and generalizing those skills. Finally, video modeling appears to be a more cost and time efficient method for teaching skills. Compared to live modeling, video modeling allows for repeated viewings of the same model, without the model present. In addition, video modeling allows for a standard model to be shared with a variety of individuals and can be created for use in a variety of natural contexts (e.g., home, community). Given recent policy-

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related debates regarding the identification and use of effective, yet cost-efficient strategies for children with ASD (Simpson, 2003), video modeling holds promise.

Despite these advantages, several questions remain with regard to the effects of video modeling interventions for children with HFA/AS. First, the degree to which video modeling results in a single pattern of behavior, or repetitive response, has not been investigated. Becuase video models do not demonstrate variations in presentation through multiple exemplars, the question remains whether the acquired scripted verbal and modeled motor responses will be used in a repetitive fashion by the child. This situation may be especially problematic when teaching social skills. Future research should design data collection procedures that would be sensitive to this possibility. Second, the effects of video modeling have not been investigated in applied settings (e.g., school). In each of the studies reviewed, video modeling interventions were created and tested in clinic settings. While this is important to establish video modeling as a potentially effective approach, it leaves many unanswered questions, such as how applicable and accepted video modeling would be in non-clinic based settings. Third, current video modeling research has not investigated maintenance of skills with children with HFA/AS over time. Finally, the effect of a combined intervention of video modeling with other visual support strategies (e.g., Social Stories) has not been investigated.

<center>Summary</center>

A fundamental component of HFA/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

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intervention programs for children with HFA/AS due to the increasing prevalence and increasing use of the practice of mainstreaming in schools. However, little research has been conducted to develop such strategies.

The presence of language and elevated cognitive skills seen in children with HFA/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. Two areas of intervention that appear to hold the most promise for educating children with HFA/AS are through the use of Social Stories and video modeling.

Through the use of Social Stories, children with HFA/AS can learn the skills necessary to understand social situations and subsequently increase interactions with others. 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 reduce inappropriate behaviors (Scattone et al, 2002), how to reduce tantrum behavior (Kuttler, Myles, & Carlson, 1998; Lorimer, Simpson, Myles, & Ganz, 2002), how to act appropriately during lunchtime (Norris & Dattilo, 1999), and how to improve social behaviors and communication (Adams et al., 2004; Sansosti & Powell-Smith, 2004). Unfortunately, most 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 HFA/AS, who express no deficits in language abilities, may have an even greater impact when systematically controlled. Although Social Stories have shown

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promise, questions remain as to what makes them effective and how they can be used efficiently in applied settings.

Video modeling has also shown promise as a successful intervention for augmenting the learning characteristics of children with HFA/AS. Specifically, video modeling capitalizes on the visual strengths of individuals with autism and promotes learning through repetition and sameness in training sessions. Video modeling has been used successfully to teach children with ASD conversational (Charlop & Milstein, 1989) and perspective-taking skills (Charlop-Christy, & Daneshvar, 2003; LeBlanc et al., 2003), as well as complex play sequences (D'Ateno, Mangiapanello, & Taylor, 2003). More recently, video modeling has shown evidence as a positive intervention to increase the social initiations of children with ASD (Nikopoulos & Keenan, 2003, 2004). It is hypothesized that the effectiveness of video modeling is predicated on the visual strengths and need for predicable routines that many children with ASD possess. Therefore, video modeling used as an adjunct to Social Stories may increase the utility of the intervention by providing a predictable model presented in a preferred manner.

With the increased use of the practice of mainstreaming, and with the prevalence of HFA/AS increasing at such substantial rates, it is necessary to begin researching approaches to help children with HFA/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 HFA/AS. With greater awareness of the social difficulties of children with HFA/AS comes greater knowledge in developing

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appropriate strategies of intervention. Thus far, video modeled Social Stories appear to hold promise as a logical and beneficial intervention to diminish the qualitative differences that make children with HFA/AS so conspicuous. However, research on social skills interventions with children with HFA/AS is scant, and research on video modeled Social Stories with children with HFA/AS currently is nonexistent

Purpose of the Study

The purpose of the study was to examine the effectiveness of video modeled Social Story interventions on the social communication skills for children with HFA/AS. This study expands the current body of research in this area by: (a) employing a means of experimental control, (b) probing for generalization; (c) incorporating indices of treatment efficacy; and (d) examining the social validity of the intervention. In addition, this study adds support for the use of intervention approaches that can be used by educators in applied settings with children and youth with HFA/AS

Chapter III

Research Methods

This chapter provides a description of the method used to conduct the study. The participants, instruments, treatment protocol, and data analysis procedures are described specifically.

Participants

The participants for this study were selected from an established educational program for students with Autism Spectrum Disorders (ASD) located in an elementary school in West Central Florida. Prior to participating in this study, a pool of children who were not currently receiving any kind of social skill treatment were targeted for participation. To be included, potential participants were not to have received social skills training from school-based staff for a period of at least one year. Information about these potential participants was gathered through educational records review and discussions with the lead school psychologist at the school. Information including the level of the child's social skill development, cognitive and verbal abilities, and parent involvement was used to prioritize the sample pool to four potential participants. Once four potential participants were identified, their parents were contacted and briefed about the study by the school psychologist. If the parents expressed interest in this study, the primary investigator contacted them to provide more details of the study and answer any questions.

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Four elementary-age participants were selected based on multiple inclusionary criteria. The four target participants were boys ranging in age from 6 years 6 months to 10 years 6 months (M = 8 years, 6 months). For inclusion in this study, the participants (a) had a current diagnosis of autism, Asperger's Syndrome (AS), or Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) according to the *Diagnostic and Statistical Manual for Mental Disorders—Fourth Edition—Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000); (b) displayed current levels of cognitive functioning in the average to above-average range on a published standardized measure (e.g., Standford-Binet Intelligence Scales—Fifth Edition); (c) demonstrated the ability to communicate functionally with others as measured by a standardized language instrument (e.g., Clinical Evaluation of Language Fundamentals—Third Edition, CELF-3); and (d) were included in the general education curriculum. Results of standardized testing are summarized in Table 4. Prior to final inclusion in this study, parental permission for participation and child assent was obtained. 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). None of the participants demonstrated hearing, vision, or physical motor impairments.

Table 4

Participants' Standardized Test Performance

	Participants			
Test	Vito	Michael	Santino	Fredo
GARS	---	103	113	75
GADS	127	---	---	---
OWLS				
Oral Language Composite	---	74	53	88
Listening Comprehension	---	75	62	89
Oral Expression	---	77	48	90
WPPSI—III				
Full Scale Intelligence	120	---	---	---
Verbal Intelligence	118	---	---	---
Performance Intelligence	125	---	---	---
Processing Speed	88	---	---	---
SB-IV				
Total Composite	---	---	---	94
Verbal Comprehension	---	---	---	83
Nonverbal Reasoning	---	---	---	102
RIAS				
Nonverbal Intelligence Quotient	---	---	84	---

Note. GARS, *Gilliam Autism Rating Scale* (Gilliam, 1995); GADS, *Gilliam Asperger's Disorder Scale* (Gilliam, 2001); OWLS, *Oral and Written Language Scales* (Carrow-Woolfolk, 1995); WPPSI, *Wechsler Preschool and Primary Scale of Intelligence—Third Edition* (Wechsler, 2002); SB-IV, *Stanford-Binet Intelligence Scale—Fourth Edition* (Thorndike, Hagen, & Sattler, 1986); RIAS, *Reynolds Intellectual Assessment Scale* (Reynolds & Kamphaus, 2003).

Vito

Vito (age 6 years 6 months) attended Kindergarten in a primary inclusion classroom at the elementary school. Vito received a diagnosis of AS and scored in the *very likely* range of Asperger's on the Gilliam Asperger's Disorder Scale (GADS; Gilliam, 2001). Vito spoke in complete sentences and was capable of reading above grade level. Because no communication concerns were noted, there was no record of any formal language evaluations. Across all academic domains, Vito demonstrated above average performance with no academic concerns (see Table 4). His teacher described Vito as a very good reader with a "very scientific mind."

Both parents and Vito's teacher noted that Vito enjoys playing video games and studying dinosaurs. Vito often talked of dinosaurs to his classmates during transition times. Aside from these strengths, Vito was described as having difficulty in group social situations. Specifically, both parents and teachers stated that Vito can become extremely oppositional and negative when routines are broken. In addition, they noted that he has difficulty engaging in social activities with other children (e.g., initiating conversations, joining in activities). Direct observations conducted on the playground verified this information. Information from these informal observations revealed that Vito wandered the playground alone and failed to initiate any conversations with peers or join in any game activities with his classmates. A subsequent Social Story to reflect this weakness was created (Appendix D).

Michael

Michael (age 9 years, 3 months) attended second grade in a primary inclusion classroom at the elementary school. He had been diagnosed with autism and scored in the

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average range of autism on the Gilliam Autism Rating Scale (GARS; Gilliam, 1995). In addition, Michael demonstrated low average nonverbal intelligence (see Table 4) and below average delays in communication on a standardized measure. However, he conversed using simple sentences and was able to communicate effectively with adults and peers within the school setting.

Main areas of difficulty for Michael appeared to be spontaneously asking classmates to play. His parents stated that Michael enjoys playing tag with other children. However, he has difficulty asking other children to play with him and it sometimes takes a great deal of effort to get Michael to initiate or engage in an activity. Michael's teacher verified this information, stating that "Michael shows a great deal of interest in play, but doesn't seem to know how to ask." Both the parents and the teacher believed that Michael would benefit from an intervention that focused on how to initiate conversations or play activities. Observations conducted during recess verified the information gathered from Michael's family and teacher. Specifically, Michael often spent the first few minutes of recess on the playground equipment with other children engaging in parallel play (e.g., walking up to other children and just standing beside them). However, if no other children asked him to play, he would walk away and spend most of his time alone behind several trees and palmetto bushes located in the back corner of the playground area. Because of his interest in playing tag (potential reinforcer to promote skill development), Michael's Social Story focused on asking to play tag during recess (Appendix E).

Santino

Santino (age 8 years, 10 months) attended the third grade in an intermediate Language Learning Disabled (LLD)/Varying Exceptionalities (VE) inclusion setting. He scored in the *average* range of autism on the GARS. On a cognitive measure, Santino demonstrated low average nonverbal intelligence (see Table 4). In addition, he demonstrated advanced skills in reading and he was able to read and comprehend grade level materials. Santino demonstrated severe delays in his ability to communicate with others (see Table 4). However, the language scores that were available for review were several years old and may not have been an accurate estimate of Santino's current communication skills. Santino was able to communicate his wants and needs using simple sentences and his current goals and objectives for his speech and language therapy were focused on social pragmatics. His speech pathologist noted that Santino frequently used Social Stories, and benefited from them in the past.

With regard to his social communication skills, both Santino's mother and his teachers indicated that he would benefit from learning how to initiate and maintain conversations with others. His mother and teachers also noted that Santino was, at times, socially immature and engaged in inappropriate social behaviors (e.g., walk away from a conversation, scream in other's ears, show little interest in communicating) that may offend others. In addition, Santino often was teased by other students on the playground. Preliminary observations revealed that Santino was often followed by several peers who not only protected him from being teased, but also tried to get him to engage in activities. During these interactions, Santino demonstrated difficulty with joining in activities, following the lead of another student, and other inappropriate behaviors. Specifically,

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Santino initiated some conversations, but he often walked away and sometimes pushed others. 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 F).

Fredo

Fredo (age 10 years, 6 months) attended the fourth grade in an intermediate inclusion classroom with support for academic subjects under the diagnosis of language impaired. He had been diagnosed with AS and scored in the *low probability* range of autism on the GARS. No information using the GADS was available. Fredo demonstrated cognitive and language abilities in the *average* range of functioning (see Table 4). Socially, Fredo avoided interacting with peers, but communicated with adults on topics of personal interest (e.g., favorite movies and video games). Preliminary observations of Fredo on the playground revealed that he spent much of his time wandering around watching other children play. Occasionally, Fredo would tell on other kids for breaking playground rules. This behavior was often followed by Fredo approaching one or more teachers to explain who was violating a playground rule and why. Unfortunately, Fredo was withdrawn early in the study due to parent concerns related to missing academic engaged time. Because of his withdrawal, information beyond basic descriptive information is unavailable.

Settings

Observations of the three participants were conducted at the participants' school during regular school hours. The primary setting in which these observations occurred was directly related to the identified behaviors targeted for the video-modeled Social

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Story interventions. For example, instances of asking to play or joining in play activities or conversations with other children were observed on the school playground. Respect for all school personnel was regarded and the primary investigator discussed the procedures with those involved prior to any observations.

For Vito and Michael, the environmental setting was a fenced in area on the side of the school where there were several swings, slides, and monkey bars. In addition, this area had one large "jungle gym" and a picnic table. Around this area was a sidewalk where children could sit and play games or engage in conversation. During recess time, there were multiple classrooms on the playground at once. Typical behaviors included climbing on the "jungle gym" and other playground equipment, playing tag, and engaging in conversation.

For Santino, the environmental setting included the fenced in area described previously, as well as a nearby courtyard that included multiple basketball hoops. Recess time occurred immediately following lunch and included six classrooms sharing the same areas. During this time, the children were permitted to use multiple toys (e.g., balls, hulla-hoops, jump-ropes) in the courtyard, play on the swing/slide set, or walk around and talk. Typical behaviors included playing kickball or shooting basketball, jumping rope, and frequent social interactions among students.

<div align="center">Materials and Measures</div>

Social Stories

Three Social Stories were designed addressing an identified target behavior for each participant. Each Social Story was designed according to Gray's (1994, 2002) and Gray and Garand's (1993) recommendations. These Social Stories were individualized

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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 cardstock paper and laminated and fastened together with spiral binding across the top. Including the cover page, there were five to nine pages in each story. The cover page of each Social Story contained only the title, which was placed ½ inch from the top of the page and typed in 16-point Times New Roman font. The remaining pages contained one or two sentences typed in 14-point Times New Roman font and were 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 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. 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 in this study to emphasize and communicate the message of each social story. Although children with HFA/AS possess average language skills, the Mayer-Johnson symbols were used to increase the communicative intent of the Social Story message, and make the story more appealing to the reader.

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Video Models

Three videotapes were constructed in which the content of each participant's Social Story was modeled by a similar aged peer. Similar age peers were used to increase the generalization of the intervention. In each of the videotapes, models engaged in the targeted behavior in a way that is as natural as possible, avoiding a slow or exaggerated pace. Each video was approximately 45 seconds to one minute in duration.

Computer Based Video Modeled Social Stories

To increase the consistency of intervention implementation, an enhanced digital media presentation was created. Specifically, each participant's Social Story and accompanying video model was converted into a self-advancing slide show using Microsoft Power Point. Each of the slides in the presentation depicted pages of the Social Story in the exact size and format as described previously. The only difference was the title page. For the computer based intervention, the title page included a button with the word "Start" for the participant to click. When the participant clicked the Start button, the Power Point slides advanced automatically. In addition, voice-over for each slide was incorporated. That is, the primary investigator read each line from the Social Story for the student. Once all of the pages of the Social Story had advanced, a page appeared with the words, *Show Me How* and accompanying voice-over that said, "show me how to do it." After this slide, the video clip played automatically.

Each computer-based video modeled Social Story was presented on an Apple iBook G4 laptop computer. Vito and Michael shared one computer that was located in the Behavior Specialist's office. The Behavior Specialist's office was located in the between both participants classrooms and allowed for easy access to and from the classroom. For

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Santino, a separate computer was located in his classroom and designated for him during the intervention. Each participant wore a pair of headphones during the computer-based intervention. Headphones were used to make sure the participants heard the content of their Social Story, as well as the video model practicing the skill. Furthermore, headphones were used to limit the possibility of auditory distractions (e.g., other students talking).

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 answer the research questions. 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 negative/absent occurrences of the targeted social communication behavior (i.e., joining in, initiating a conversation). A sample of the SIRS is provided in Appendix G. 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 or absent. The number of total intervals in which each type of behavior occurred

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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 engaged or not. The percentage of intervals calculated provided 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 observers 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 H. 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.

Intervention Acceptability

Teacher acceptability of the video modeled Social Story intervention was assessed after the final (maintenance) phase of the study. Specifically, each participant's teacher completed the Intervention Rating Profile (IRP-15; Martens, Witt, Elliot, & Darveaux, 1985). The IRP-15 is a 15-item scale that was developed to evaluate the acceptability of an intervention (see Appendix I). Reliability of the instrument is .98 (Martens, et al., 1985). Scores on the IRP-15 can range from 15 to 90, with higher scores indicating a greater acceptance level. Scores above 52.50 are considered acceptable (VonBrock &

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Elliot, 1987). Questions on the IRP-15 were adapted to better align with the parameters of this study.

Dependent Measures

The primary behaviors identified for each participant related to social communication (e.g., greeting behaviors, 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. Information collected included identification of the behavior in unambiguous terms, relevant cues of the behavior, and the typical sequence of events that occurred prior to and after the behavior. 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) social communication behaviors for each individual. Specifically, the dependent measures for this study were joining in (Vito and Michael) and maintaining conversations (Santino).

Joining In

Joining in was defined as instances in which the target participant was actively initiating or participating in some play activity or conversation with one or more children (see Appendix J). Examples of joining in were defined as times when the target

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participant (a) called a peer's name to gain attention (e.g., "Hey"), (b) initiated a new idea or topic, and (c) expressed enjoyment to peers regarding their interaction together (e.g., "This is fun!"). During joining in, the participant was observed initiating requests or comments that were related to an ongoing topic or event. Displays of joining in demonstrated awareness of group interactions and appropriate ways to ask to participate. Joining in also included any type of organized group game (e.g., tag, hide-and-seek) that involved taking turns and communicating with the group because such games require children to secure attention and initiate comments and/or requests related to the ongoing activity. Nonexamples of joining in included any sort of aggressive act such as shouting, pushing, name calling, hitting, and/or making forceful bodily contact with someone else during an activity.

Maintaining Conversations

Maintaining conversations was defined as instances in which the target participant actively contributed to a reciprocal conversation or attended to a topic of conversation with one or more children (see Appendix K). Active displays of maintaining conversation demonstrated awareness of the topic of conversation as indicated by the target participant using a variety of social exchanges, such as talking about a game being played on the playground. Examples included instances when the target participant (a) engaged in "small talk" with another peer, (b) listened to an ongoing conversation and showed approval (e.g., nodding), and (c) provided a comment following a 3-second interval after a peer's last utterance. Nonexamples included walking away from an ongoing conversation or utterances that were not interpretable or unintelligible to the observer.

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Procedure

A multiple baseline across subjects experimental design was used in this study. 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 level of behavior 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.

Prior to participating in this study, the school psychologist at the school reviewed the educational records of children identified with HFA, AS, and/or PDD-NOS. Information regarding the inclusion criteria previously described (e.g., cognitive ability, ability to communicate orally) was readily available for the school psychologist to review. Based on the information gathered, the school psychologist identified four children who met the specified inclusion criteria. Once children were identified, the school psychologist contacted the parents and provided them with brief information about the study. If parents expressed interest in the study, they were asked to participate in a brief orientation. The primary investigator was available at this orientation to discuss the details of the study, as well as show examples of Social Story and video modeling interventions to the parents and the child. This orientation was under the supervision of the school psychologist employed at the elementary school.

Parental permission for participation in the study was obtained for four individuals identified in the process explained above. Parents were given a consent form (Appendix L), 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. After parents agreed to participate, child

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assent was obtained. Child assent was obtained by explaining the requirements of participation (e.g., be read a story and watch a video of children playing) to the participants in age-appropriate terms. In addition, parents and participants were told that participation in this research in no way impacts their grades or academic performance in school. Following this, teachers directly involved with the participants were told about the intervention and target behaviors were selected for each individual.

Identification of Target Behaviors

Following the consent process, specific target behaviors were identified for each participant. Target behaviors relating to social communication skills (e.g., greeting behaviors, joining in, sharing) were identified through interviews with parents and teachers. Interviews were conducted by the primary investigator using a semi-structured interview adapted from O'Neill et al.'s Functional Assessment Interview (1997; see Appendix M). The focus of these interviews was on areas of concern or weakness for each child, information on the relative frequency of the identified behaviors, and identification of appropriate replacement behaviors. Once a specific behavior was identified for each participant, detailed information regarding those behaviors was gathered prior to beginning the baseline phase through preliminary observations of the situations in which the behaviors were likely to occur. These observation data were collected by the primary investigator and used to develop specific Social Stories and videotapes for each participant. Information collected included relevant cues of the behavior, the typical sequence of events that occur prior to and after the behavior and, descriptions of the setting specific variables for that behavior. Such information was

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essential to understanding what would be important to include in the Social Stories, as well as what information was irrelevant.

Observer training

Each of the observers who 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. Specifically, observers trained with videotapes until they reached 80% agreement with the operational definitions of targeted behaviors using the following formula:

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

The training videotapes demonstrated an adult, and adults, engaging in appropriate and inappropriate social communication skills. For example, a segment of the video contained two adults in a conversation and a third adult who joins in the conversation. In the video, the third adult did not engage in any social initiation behaviors, even after being prompted by the other two individuals on the training tape. Observers practiced recording the frequency of no social initiation behavior (absent social initiation). The videotapes permitted training in which frequencies of identified behaviors could be recorded.

Baseline period

After obtaining the appropriate agreement criterion during training, the observers began collecting baseline data for all of the participants in this study. During the baseline

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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) 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 two times per week and were, on average, 15 minutes in length.

Baseline observations occurred until stability was established. Stability was defined as a relatively constant rate of behavior. The minimum number of observations to satisfy the stability was three data points. Specifically, if baseline data demonstrated 3 consecutive data points of no occurrences of behavior, the data were considered stable. However, baseline data was somewhat variable for two of the participants. Because of this, stability was defined as a relatively stable (flat) or decreasing (decelerating) trend across all of the data points collected for each participant. 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.

Observations of comparison peers also were conducted during unstructured activities (e.g., school playground) to ascertain the median level of social interactions in which typical peers engage. Peer comparison data were collected because little is known

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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 video modeled Social Stories on increasing the social engaged time of the participants. 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 meant that during each comparison peer interval a different child was observed. Comparison peers were not identified by name or in any other identifying manner and thus their confidentiality was maintained. Peer comparison data were collected throughout all phases of this study.

Intervention Phase

Three Social Stories were created for each participant according to Gray's (1994, 2002) recommendations. Ideas for the content of the Social Stories were derived from the interviews and preliminary observations described previously. In addition, input from each participant's teacher was gathered through a semi-structured interview using the Social Story Information Form (see Appendix N). This form consists of open-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). This form also allowed 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.

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After the Social Stories were created for each of the participants, a videotape depicting a similar aged child engaging in the target behavior(s) was made. Several steps to ensure positive treatment effects from the video modeled Social Story occurred. First, selection of the model/actor was based on the similarity in age of the participant. Second, a script was created for each actor to follow. Each script was simply a description of the lesson the model was to demonstrate. Finally, each model practiced the script prior to videotaping. The primary investigator consulted with models to ensure that the visual aspects of each modeled behavior was presented in the best way possible. Each videotape was created using a digital (MiniDV) camcorder. The settings for each video model were directly related to the targeted behavior and were recorded on a public playground. This consideration was designed to increase the likelihood of skill generalization.

Validation of each participant's Social Story and corresponding videotape occurred prior to beginning the intervention. Four professionals from a center for autism in West Central Florida validated the intervention materials. Two of these individuals who were trained in special education and who specialized in working with individuals with ASD examined the content and design of each Social Story using the Social Story Validity Checklist (see Appendix O). This checklist was created by the primary investigator and was based on the specific requirements for designing a Social Story (e.g., sentence types, ratio of sentences) as outlined by Gray (1998) and Gray and Garrand (1993). Based on the feedback from these two individuals, all of the participants' Social Stories included the appropriate types of sentences in the specified ratio. However, general suggestions were provided to change the wording of some sentences to ensure ease of reading and/or understanding by the participants.

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After the content of each Social Story was validated, two advanced doctoral students in school psychology working with individuals with ASD reviewed the video models. Unfortunately, guidelines and/or recommendations for designing a video modeling intervention do not exist currently. However, these individuals were familiar with this type of intervention and reviewed the videotapes using the Video Modeling Validity Checklist (see Appendix P). This checklist was created by the primary investigator and was used to ensure that the target behavior was clearly demonstrated and was likely to be viewed by participants positively. Based on the information provided from the Video Modeling Validity Checklist, all of the videos depicted the targeted behaviors appropriately. However, two of the videos had to be recreated because of wind blowing into the microphone, which made it difficult to hear the content of the video.

Once the content of the Social Stories and video models was reviewed, the primary investigator made the suggested changes and created the computer-based interventions. Each intervention was created using Microsoft Power Point and Pinnacle Digital Video Editing software. After the computer-based intervention was created, each intervention was recorded onto a CD-ROM and set up on the computers located at the participants' school.

The primary investigator took the responsibility of establishing and maintaining rapport with data collectors and teachers. Implementation of the video modeled 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 stabilized, intervention with the first participant could begin. The observers continued to collect data. However, the observers were not told which

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participant was selected for the intervention. The primary investigator continued to review the data, and implemented the initiation of treatment with the next participant when stability among the first participant's data was maintained for at least three data points. Again, the observers were not told which participants entered treatment. The same process was used for the implementation of the intervention for the third participant. That is, once the data for the second participant stabilized, as defined by at least 3 data points, the primary investigator initiated the intervention for the third participant.

During the intervention phase of the study, each participant viewed his video modeled Social Story prior to the targeted social setting. A teacher or paraprofessional was identified in each classroom as the primary person responsible for implementing the intervention. This person was responsible for setting up the computer program so that the participant only had to put on a pair of headphones and click the Start button to begin the intervention. Each video modeled Social Story was reviewed by participants once per day immediately before the targeted event (e.g., recess). Observational data were collected in the same manner as baseline data. Observations continued to occur two times per week and were 15 to 20 minutes in length.

The first week that the intervention was introduced for each participant, the primary investigator assessed comprehension by asking the participant a predetermined set of questions related to the story. Specifically, each participant was asked four or five simple interrogative and who, what, when, and/or why questions to assess comprehension of the story content. All participants answered the comprehension questions with 75% to 100% accuracy.

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Procedural Reliability. Fidelity of the intervention was assessed using a treatment fidelity checklist (see Appendix Q). Specifically, the teacher or paraprofessional responsible for implementing the intervention checked off each category on the checklist whenever the participant received the intervention. This checklist indicated whether or not the participant watched the video modeled Social Story at the specified time. Procedural reliability was computed as a percentage by dividing the number of days the participant viewed the video-modeled Social Story by the number of total days in the intervention phase and multiplying by 100. Treatment fidelity was 92% for Vito and Michael and 96% for Santino.

Intervention Modifications. For Vito and Michael, treatment was modified for during the intervention phase (intervention plus prompts phase) because of reduced occurrences of previously targeted social communication skills. The previously developed video modeled Social Stories were still implemented as planned. However, teacher prompting was incorporated into the intervention. First, Vito's and Michael's teachers prompted them to use the skill they had been taught. Then the teachers prompted other students (confederates) to engage in an activity upon request from Vito or Michael. That is, when Vito or Michael appropriately asked to play, the confederates engaged in the activity with them for a period of time.

Because of these modifications, intervention phase data collection continued for a longer period than originally was planned, and maintenance data collection did not occur (a maintenance phase was originally proposed). The rationale for discontinuing maintenance data collection was to demonstrate that, even with modifications, the intervention was effective through repeated measurement across the two participants.

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Due to potential time constraints of this study (i.e., end of the school year), it was impossible to extend the length of the entire study and still collect maintenance data. Therefore, elimination of maintenance data, although not ideal, was a logical alternative. A follow-up phase occurred two weeks after the intervention.

Fading Procedure. Near the end of the intervention phase, each participant's intervention was faded over two weeks. The decision of when to fade was based on both the participants' response to the intervention (as indicated by consecutive increasing data points or stable trends) and the time remaining for data collection. During the first week, the intervention was in effect for four out of the five school days. Data collection continued during fading in the same manner as it did during the previous portions of the intervention phase. During the second week, participants received the intervention twice during the week (e.g., Tuesday and Thursday). Following the fading, no intervention occurred and follow-up phase data were collected.

Follow-Up Phase

Two-weeks following the intervention (one week after the video modeled Social Stories were faded), observations examining the maintenance of targeted skills occurred. Follow-up data were collected in the same manner as baseline and intervention data. Observations occurred two times during the week and lasted approximately 15 minutes. The follow-up phase lasted two weeks, allowing for four data points to be collected. Although a limited amount of data points were available, this phase served as maintenance of targeted skills for each participant.

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Generalization Probes

Generalization probe observations were conducted for each participant during baseline, intervention and maintenance phases of this study. Observations during the generalization probes occurred in the same fashion as the primary observations and were conducted weekly. No interventions occurred during the generalization period. Settings for generalization probes included other unstructured locations where targeted social communication behaviors could be observed. For Vito and Michael, generalization probes occurred after lunch on a separate playground located behind the school. This area contained some playground equipment located in a fenced in area that contained shredded rubber tires. Generalization probes for Santino occurred in the school cafeteria during lunch. Santino sat with his classmates during lunch and was frequently visited by his mother, who was a volunteer at the school.

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, 25% of the intervention condition, and 20% of the follow-up condition. Observations were considered reliable if at least 80% inter-rater agreement was achieved for each observation. Inter-rater agreement was consistently above 80% for all participants. Agreement ranged from 87% to 100% for Vito ($M = 93\%$), 82% to 100% for

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Michael ($M = 89\%$), and 81% to 94% for Santino ($M = 89\%$). A summary of agreement

for each participant across phases in presented in Table 5.

Table 5

Interobserver Agreement for Each Participant by Phase

	M	Min.	Max.
Vito			
Baseline	98%	96%	100%
Intervention	91%	87%	97%
Intervention + Prompts	88%	84%	95%
Follow-Up	95%	95%	95%
Michael			
Baseline	93%	89%	100%
Intervention	88%	82%	91%
Intervention + Prompts	86%	83%	90%
Follow-Up	87%	86%	88%
Santino			
Baseline	89%	81%	94%
Intervention	87%	86%	90%
FollowUp	92%	92%	92%

Data Analyses

Observational Data. Observational data collected by the SIRS was used to answer

the first and second research questions. With regard to the first research question, *Does*

an intervention program consisting of video modeled Social Stories increase the

frequency of identified social communication skills of students with social impairments?,

descriptive visual analyses were conducted. Three visual inspection methods were

employed for analyzing changes in the frequency of each targeted social communication

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

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participants. First, the average daily percentage of social communication 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 communication behavior were analyzed to examine changes in each participant's mean daily percentage of social communication behavior during baseline, intervention, and maintenance phases. For each phase, descriptive statistics (e.g., mean, standard deviation) for each participants' targeted behaviors were calculated using *SPSS*.

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 maintenance phases. Changes in slope were computed using Microsoft Excel within each phase. For each phase, celeration lines were drawn. The slope of each line and the initial and final level of each phase are expressed numerically. The changes in level were estimated by comparing the last data point in the baseline and the first data point in the intervention phase. The larger value was divided by the smaller yielding a change in level ratio. Similarly, for a change in slope, the larger slope was divided by the smaller slope yielding a change in slope ratio. Examining changes in level and slope summarized the differences in performance across phases for each of the participants.

Slopes that indicate positive improvement in behavior were considered significant. Because the range of social functioning in children with HFA/AS is generally low, any improvement in social communication 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 were considered significant.

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Finally, observational data were analyzed to examine the percentage of overlapping data points for each participant between baseline, intervention, and maintenance phases. Overlap was computed by comparing data points in the intervention phase with baseline standards and with maintenance 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 communication and interactions are such a broad skill, they were not expected to be linear.

With regard to the second research question: *Do intervention effects maintain following the intervention*, 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 compared to intervention and baseline phases.

Generalization probe information was used to answer the third research question: *Do intervention effects generalize to other settings*? Each participant's probe data were compared to observational data gathered from the primary observation setting. These data were placed on the same graph as the observational data, but appear as an open circle. Probe data were examined visually. Generalization was achieved if probe assessments revealed increased trends of targeted skills across the intervention and follow-up periods.

Peer comparison data were used to test the fourth research question: *Do participants demonstrate clinically significant increases in social communication*? Each participant's data was compared with comparison peers during the observations using the SIRS. This information was then used to graph the percentages of target behaviors for

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

In addition to these data, information from the OASIS was used to answer the fifth research question: *Do participants demonstrate increases in social interaction skills*? Data from the OASIS was used to determine the mean percentage increase in socially appropriate behaviors for each of the participants across baseline, intervention, and maintenance phases. These data came from the yes/no ratio on the OASIS. The mean change in the percent of appropriate skills and range of the percent of appropriate skills was calculated for each participant. Therefore, these data were examined descriptively, meaning no statistical tests were performed to determine significance of change across phases.

Intervention Acceptability. Information from the IRP-15 was used to answer the last research question: *Do teachers value video modeled Social Stories as acceptable interventions*? Judgments on the acceptability of the intervention package were evaluated using the standardized scoring protocol on the IRP-15. Teacher ratings were measured based on the scaled score obtained. This information was examined descriptively.

Chapter IV

Results

This chapter presents the data relative to each research question. Specifically, for research questions one through four, visual analyses of observational data are presented. For the fifth and sixth research questions descriptive data analyses are presented. The chapter concludes with a summary of the findings.

Participants' Social Communication Progress: Targeted Skills

The first research question was, *Does an intervention program consisting of video modeled Social Stories increase the frequency of identified social communication skills of students with social impairments*? Results were examined through visual analysis of data obtained by the Social Interaction Recording System (SIRS).

Figure 1 provides a graphic display of the percentage of target behaviors (joining in and maintaining conversations) for each participant across baseline, intervention, and follow-up phases. For Vito and Michael, an additional intervention plus prompts phase is displayed to account for the intervention modifications that were made. Detailed summaries of the data in terms of changes in level, slope, and percent of overlapping data points are reported.

Figure 1. Displays of Target Behaviors Across Participants

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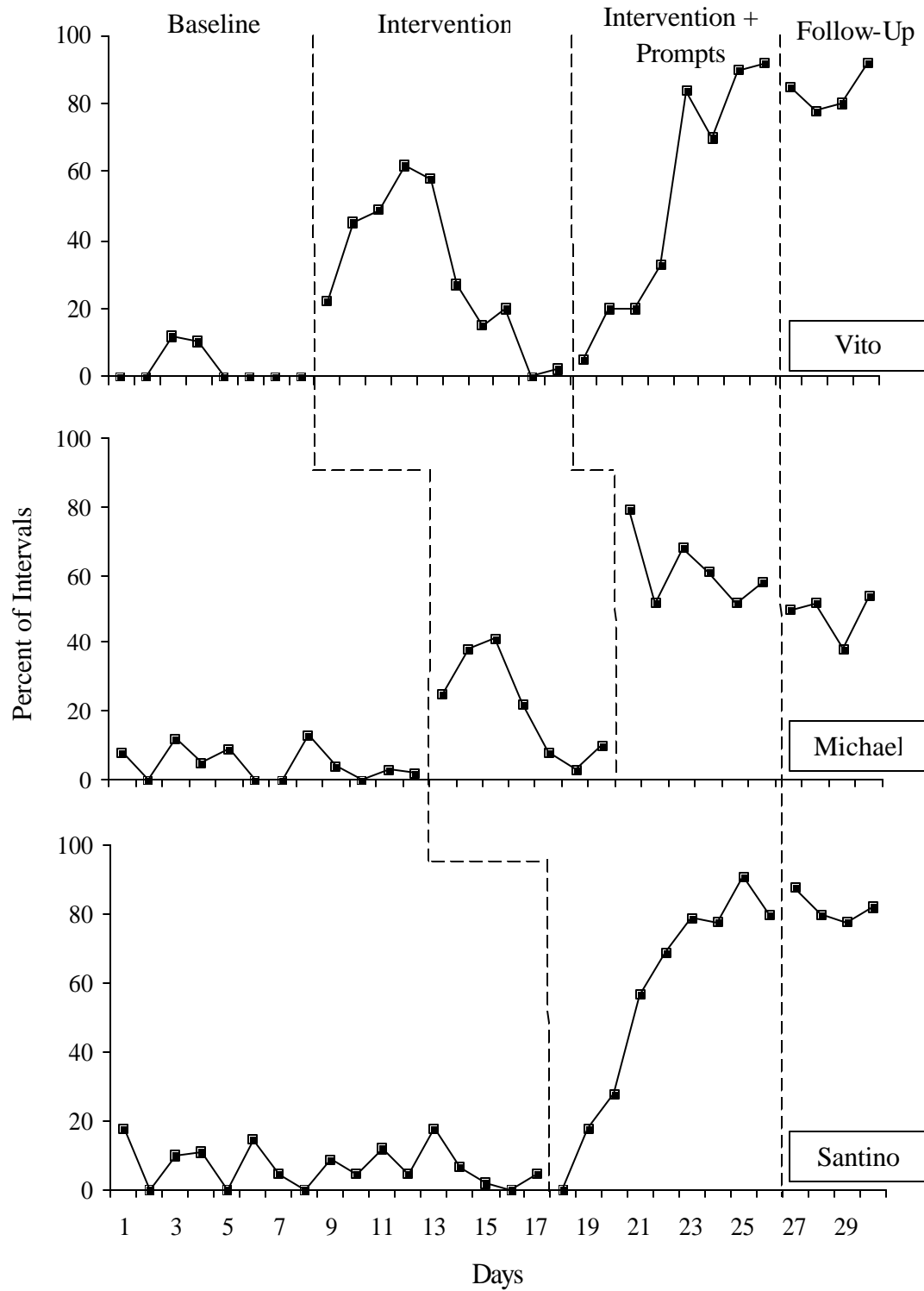
Vito

Prior to intervention phase, Vito displayed relatively consistent low rates of joining in behaviors (see Figure 1). In fact, with the exception of two data points, Vito demonstrated zero instances of targeted behavior. Upon implementation of the intervention, an immediate increase in the daily percentage of joining in emerged. Specifically, from the last data point during the baseline period (0% joining in) to the initial data point during the intervention phase (22% joining in) there was a 22% increase in rates of joining in behavior. This increase demonstrates a rapid change in behavior with the implementation of the video modeled Social Story intervention. Initially, Vito's behaviors continued to increase for the next three data points. However, a steady decline in Vito's behaviors emerged (see Figure 1). Anecdotal data revealed that Vito was not receiving social reinforcement for engaging in his target behavior. In fact, after asking to join in activities, other children told Vito they did not want to play with him or they simply walked away. Subsequent data collection confirmed these peer behaviors, and Vito began interacting less and less with his peers until finally his rate of joining in reached zero. When intervention modifications were introduced (child confederate and prompting), rates of joining in began to increase steadily again throughout the intervention plus prompts phase (see Figure 1).

The overall mean percentage of joining in for Vito during baseline was 2.75%. During the intervention phase, Vito's mean level of performance averaged 30%. Despite declining data, Vito's average performance during the intervention period was approximately 27.25% higher than baseline. When intervention modifications were introduced (intervention plus prompts phase), Vito's joining in behaviors averaged

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51.75%, an increase of 49% compared to baseline. During follow-up, Vito maintained an elevated performance of joining in behaviors. Specifically, mean percentage of joining in for Vito during follow-up was 83.75% (81% higher than baseline). Descriptive statistics regarding the changes in mean are provided in Table 6.

Table 6

Descriptive Statistics for Joining In Behavior for Vito

	M	*SD*	*Min.*	*Max.*
Baseline	2.75%	5.12	0	12
Intervention	30.00%	22.30	0	62
Intervention + Prompts	51.75%	35.88	5	92
Follow-Up	83.75%	6.24	78	92

Prior to the implementation of the video modeled Social Story intervention, Vito demonstrated a slightly decreasing trend of displays of joining in (slope = -0.55). During the intervention phases, two different trends emerged. For the intervention phase, Vito's joining in demonstrated a rapidly decreasing trend (slope = -4.92). However, the direction of Vito's behavior changed substantially when intervention modifications were made. Specifically, the trend of joining in for Vito demonstrated an increasing trend (slope = 13.81) during the intervention plus prompts period. During the follow-up phase, Vito continued to demonstrate increasing rates of joining in behavior (slope = 2.30). Slope values are reported in Table 7, as well as calculations of slope and level change across conditions.

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Table 7

Slope and Level Change of Joining In Behavior for Vito

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-0.55	-4.37	0 (@ last day)	22
Intervention	-4.92		22 (@ first day)	
Intervention	-4.92	18.73	2 (@ last day)	3
Intervention + Prompts	13.81		5 (@ first day)	
Intervention + Prompts	13.81	11.51	92 (@ last day)	-7
Follow-Up	2.30		85 (@ first day)	

Although data for Vito during the intervention phase were variable, the percentage of overlap of the intervention period with baseline was only 20%. When examining intervention plus prompts, the percent of overlap was 50% with the intervention period and 0% when compared to baseline. The percent of overlapping data points during the follow-up period was 100% when examining overlap with the intervention plus prompts phase and 0% with the intervention period. There were no overlapping data points between follow-up and baseline phases. These data suggest that Vito's rates of joining in behaviors during follow-up were within the same range of the intervention periods and remained higher than baseline.

Michael

Michael demonstrated variable, but slightly decreasing baseline rates of joining in behaviors (Figure 1). Upon implementation of the intervention, an abrupt increase in the daily percentage of joining in occurred. Specifically, from the last data point during the

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baseline period (2% active joining in) to the initial data point during the intervention

phase (25% active joining in) there was a 23% increase in rates of joining in behavior.

These results replicate the rapid change in behaviors following the implementation of the

video modeled Social Story intervention demonstrated with Vito. However, this rapid

change was followed by only two consecutive increasing data points. After this, a rapid

decrease in rates of responding was observed. As was the case with Vito, Michael was

not receiving immediate social reinforcement for his appropriate behaviors. Upon

implementation of the intervention modifications, rates of joining in behavior showed a

marked increase. This increase did not persist as it did with Vito and active rates of

joining in began to decrease and then level off prior to the follow-up phase (see Figure 1).

However, Michael's rates of joining in behavior remained higher than baseline.

Michael's overall mean percentage of joining in behaviors during baseline was

only 4.85%. During the intervention phase, Michael's joining in behaviors averaged 21%

(16.15% higher than baseline), despite declining data. When the intervention plus

prompts were implemented, Michael's mean level of joining in was 61.67% (56.82%

higher than baseline). In addition, Michael demonstrated maintenance of skill acquisition

during follow-up as indicated by a mean percentage of joining in behavior of 48.50%

(43.65% higher than baseline). Descriptive statistics relative the changes in mean across

time for Michael are provided in Table 8.

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Table 8

Descriptive Statistics for Joining In Behavior for Michael

	M	*SD*	*Min.*	*Max.*
Baseline	4.85%	4.62	0	13
Intervention	21.00%	14.83	3	41
Intervention + Prompts	61.67%	10.41	52	79
Follow-Up	48.50%	5.94	38	54

For Michael, a variable, but slightly decreasing trend was demonstrated during the baseline phase (slope = -.40). For the initial period of the intervention phase, the trend of joining in behavior for Michael was decreasing (slope = -5.29). When prompts were added to the intervention, a gain in previously acquired skills occurred. Despite a positive change in mean during the intervention plus prompts period, the trend of these data were decreasing (slope = -3.20). During the follow-up phase, Michael demonstrated a relatively stable rate of joining in behaviors (slope = -0.20). The slopes of each trendline, as well as calculations of slope and level change across conditions for Michael are displayed in Table 9.

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Table 9

Slope and Level Change of Joining In Behavior for Michael

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-0.40		2 (@ last day)	
Intervention	-5.29	-4.89	25 (@ first day)	23
Intervention	-5.26		10 (@ last day)	
Intervention + Prompts	-3.20	2.06	79 (@ first day)	69
Intervention + Prompts	-3.20		58 (@ last day)	
Follow-Up	-0.20	3.00	50 (@ first day)	-8

Although data for Michael during the intervention phase was variable, the percentage of overlap of intervention with baseline was only 48%. However, there was no overlap between the intervention plus prompts phases when compared to intervention and baseline conditions. The percent of overlapping data points between follow-up and intervention plus prompts was 25%. Finally, the percent of overlap between follow-up and baseline conditions was 0%. These data suggest that Michael's joining in behaviors not only increased, but also leveled off and maintained across conditions.

Santino

Santino demonstrated variable, but consistent baseline rates of maintaining conversation behaviors averaging 7.18%. Baseline data demonstrated a counter-therapeutic trend as indicated by the negative slope (see Figure 1). Upon implementation of the intervention, there was an immediate decrease in the daily percentage of active displays of maintaining conversations. That is, from the last data point during the

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baseline phase (5% active maintaining conversations) to the initial data point during the intervention phase (0% active maintaining conversations) there was a 5% change in level in the negative direction. However, this trend was reversed during the intervention phase. During the intervention phase, Santino averaged 55.56% of active communication, an increase of 48.38% from baseline. Follow-up effects for Santino demonstrated maintenance of target behaviors following the intervention. Specifically, the mean percentage of maintaining conversations for Santino during follow-up was 82%. This change represents an increase of 74.82% from the baseline condition. Descriptive statistics relative the changes in mean across time for Santino are provided in Table 10.

Table 10

Descriptive Statistics for Maintaining Conversation for Santino

	M	*SD*	*Min.*	*Max.*
Baseline	7.18%	6.11	0	18
Intervention	55.56%	32.30	0	91
Follow-Up	82.00%	4.32	78	88

As can be observed in Figure 1, there was a significant change in the slope of Santino's data across time. During the baseline condition, Santino demonstrated a slightly decreasing trend (slope = -0.27). However, during the intervention phase, Santino demonstrated a rapidly increasing trend (slope = 11.02). During the follow-up phase, Santino demonstrated decreasing rates of maintaining conversation behaviors (slope = -2.00). The slope values for each phase, as well as calculations of slope and level change across conditions for Santino are reported in Table 11.

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Table 11

Slope and Level Change of Maintaining Conversation Behavior for Santino

Condition	Slope	Change in Slope	Level	Change in Level
Baseline	-0.27	11.29	5 (@ last day)	-5
Intervention	11.02		0 (@ first day)	
Intervention	11.02	-13.02	80 (@ last day)	8
Follow-Up	-2.00		88 (@ first day)	

The percent of overlapping data points of the intervention period with baseline

was 22%. The number of overlapping data points during the follow-up period was 100%

when examining overlap with the intervention phase and 0% when compared to the

baseline phase. These data suggest that Santino continued to demonstrate active

maintaining conversation behaviors across conditions.

Participants' Social Communication Progress: Maintenance of Skills

The second research question was: *Do intervention effects maintain following the*

intervention? 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 is presented here.

For Vito, data demonstrate that maintenance of behaviors continued during the

follow-up condition (see Figure 1). Specifically, Vito's rates of joining in behaviors

continued to increase and remained elevated following the withdrawal of the intervention.

These data demonstrate that, for Vito, maintenance of the skill introduced in the video

modeled Social Story intervention occurred during the two-week follow-up period.

Similar results were found for Michael. Specifically, data suggest that Michael

continued to demonstrate improved social communication as compared to baseline (see

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Figure 1). During follow-up, these effects were not as dramatic as they were during the

intervention condition. Data during follow-up suggest that Michael maintained behaviors,

but this level of maintenance was slightly less than the gains demonstrated during the

intervention phase. However, because follow-up data remained higher than baseline and

were relatively stable, Michael's social communication behaviors demonstrate skill

maintenance.

Maintenance of increased social communication behaviors for Santino revealed a

decline in active rates of maintaining conversations (see Figure 1). That is, during the

follow-up phase, Santino began a steady decline in rates of maintaining conversations.

Although these data were decreasing, the mean level at which the follow-up data

remained was well above baseline performance. Santino's overall follow-up data suggest

maintenance of targeted social communication skills. Although indications of

maintenance are suggested, further data would be necessary to reveal a continued trend of

performance.

Participants' Social Communication Progress: Generalization

The third research question was *Do intervention effects generalize to other*

settings? To examine this question, visual analysis of data obtained by the SIRS was

conducted. Figure 2 provides a graphic display of the percentage of target behavior

(joining in and maintaining conversations) generalization for each participant across

baseline, intervention, and follow-up phases.

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Figure 2. Displays of Target Behaviors Across Participants with Generalization Probes

119
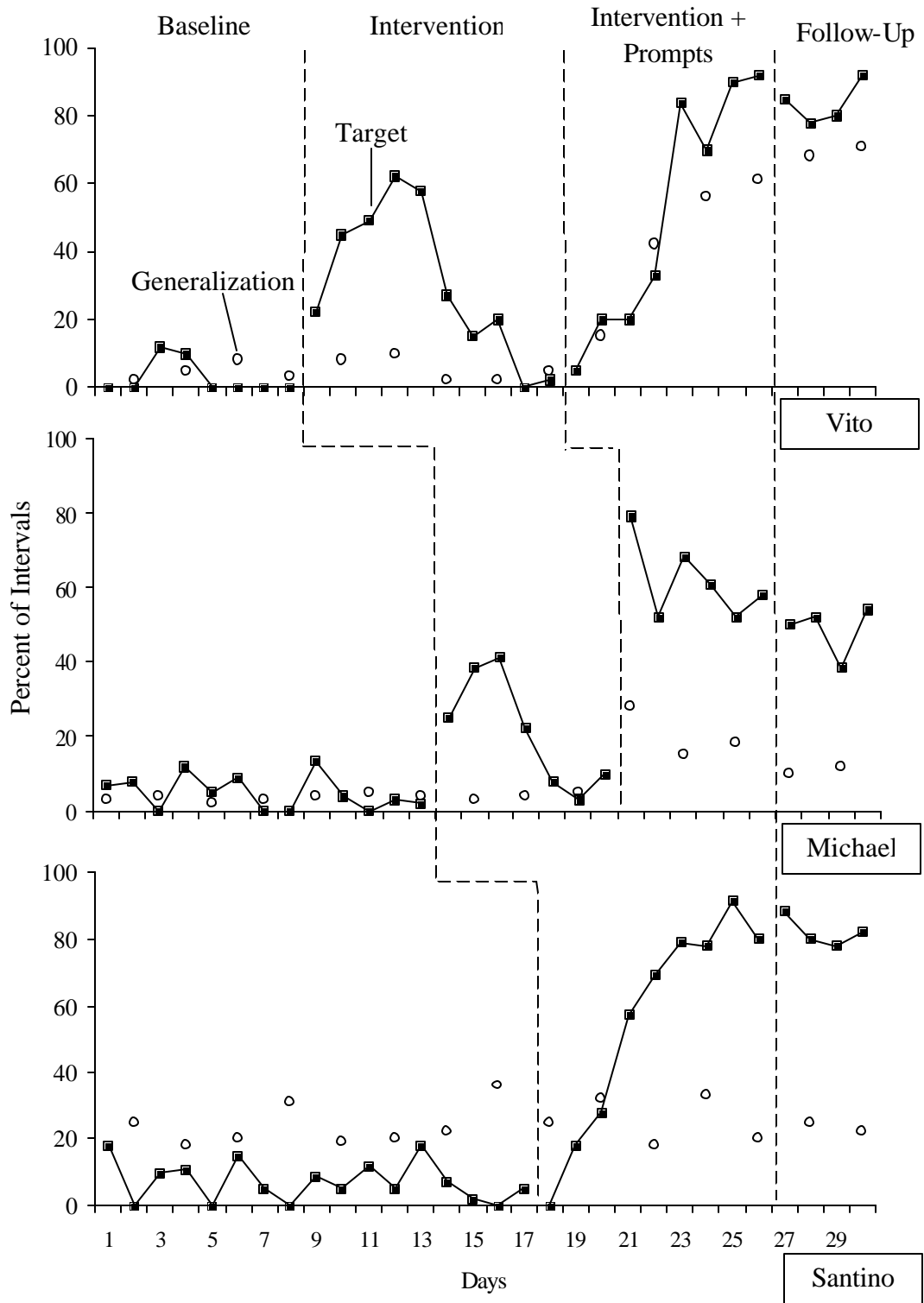
Vito

As displayed in Figure 2, Vito did not demonstrate generalization of skills until the intervention plus prompts phase. The mean and slope changes across conditions for generalization data are summarized in Table 12. At baseline, Vito demonstrated relatively no generalization of skills (4.50%). Following baseline, there was basically no change in Vito's generalization of skills during the intervention condition (see Figure 2). Specifically, Vito averaged 5.40% of joining in behaviors, an increase of only 0.90% from baseline. However, generalization of skills was particularly noticeable following the child confederate and prompting modifications to the intervention. During the intervention plus prompts phase, Vito's rates of joining in behaviors increased to an average of 43.50%. This increase is supported by a rapidly increasing trend during the intervention plus prompts period (see Figure 2). During follow-up, Vito's generalization of skills increased to 69.50%. Because only two generalization probes were collected during the follow-up period, slope was not calculated.

Table 12

Descriptive Statistics for Generalization of Joining In for Vito

	M	*SD*	*Min.*	*Max.*	*Slope*
Baseline	4.50%	2.65	2	8	0.30
Intervention	5.40%	3.58	2	10	-0.70
Intervention + Prompts	43.50%	20.63	15	61	7.60
Follow-Up	69.50%	2.12	68	71	---

Michael

Generalization data for Michael were less compelling. Specifically, Michael demonstrated no increase in the generalization of joining in skills following baseline (see

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Table 13 and Figure 2). When the intervention plus prompts phase was implemented,

Michael's generalization of joining in skills increased to an average of 20.33%. However,

the trend of generalization data during the intervention plus prompts period was

decreasing (slope = -2.50), indicating little, if any, generalization across time. Because

only two data points were collected, it is difficult to determine Michael's generalization

of skills during follow-up. Michael's teacher did note anecdotally that during the last

week of the follow-up data collection there was free time in the classroom. Because it

was the end of the day, Michael's teacher decided to provide the students with free time

to play games in the classroom. According to his teacher, Michael got the game

Candyland and started walking around the classroom asking his peers if they would play

a game with him. Unfortunately, most of his peers said, "no." Michael finally approached

his teacher who praised him for appropriately joining in and played several games with

him. Although anecdotal, this information provides some evidence as to the

generalization of skills across settings.

Table 13

Descriptive Statistics for Generalization of Joining In for Michael

	M	*SD*	*Min.*	*Max.*	*Slope*
Baseline	3.57%	0.98	2	5	0.13
Intervention	4.00%	1.00	3	5	0.50
Intervention + Prompts	20.33%	6.81	15	28	-2.50
Follow-Up	11.00%	1.41	10	12	---

Santino

Across all conditions, Santino's generalization probe data remained relatively

constant. Specifically, mean level and slope data did not vary much throughout each of

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the conditions (see Table 14). However, this may have been due to environmental situations beyond the control of this study. Each day at school, Santino ate lunch with his mother. Although they sat in the cafeteria with his classmates, most of Santino's social communication was directed to his mother. Because of this, it was not possible to determine whether Santino would have demonstrated generalization of skills as did Vito and, to some extent, Michael.

Table 14

Descriptive Statistics for Generalization of Maintaining Conversations for Santino

	M	*SD*	*Min.*	*Max.*	*Slope*
Baseline	23.88%	6.445	18	36	0.51
Intervention	24.50%	6.66	18	33	-0.45
Follow-Up	23.50%	2.12	22	25	---

Participants' Social Communication Progress: Clinical Significance

The fourth research question was, *Do participants demonstrate clinically significant increases in social communication*? Results were examined 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 target behaviors approached peer levels of these behaviors.

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Figure 3. Displays of Target Behaviors Across Participants with Peer Comparisons

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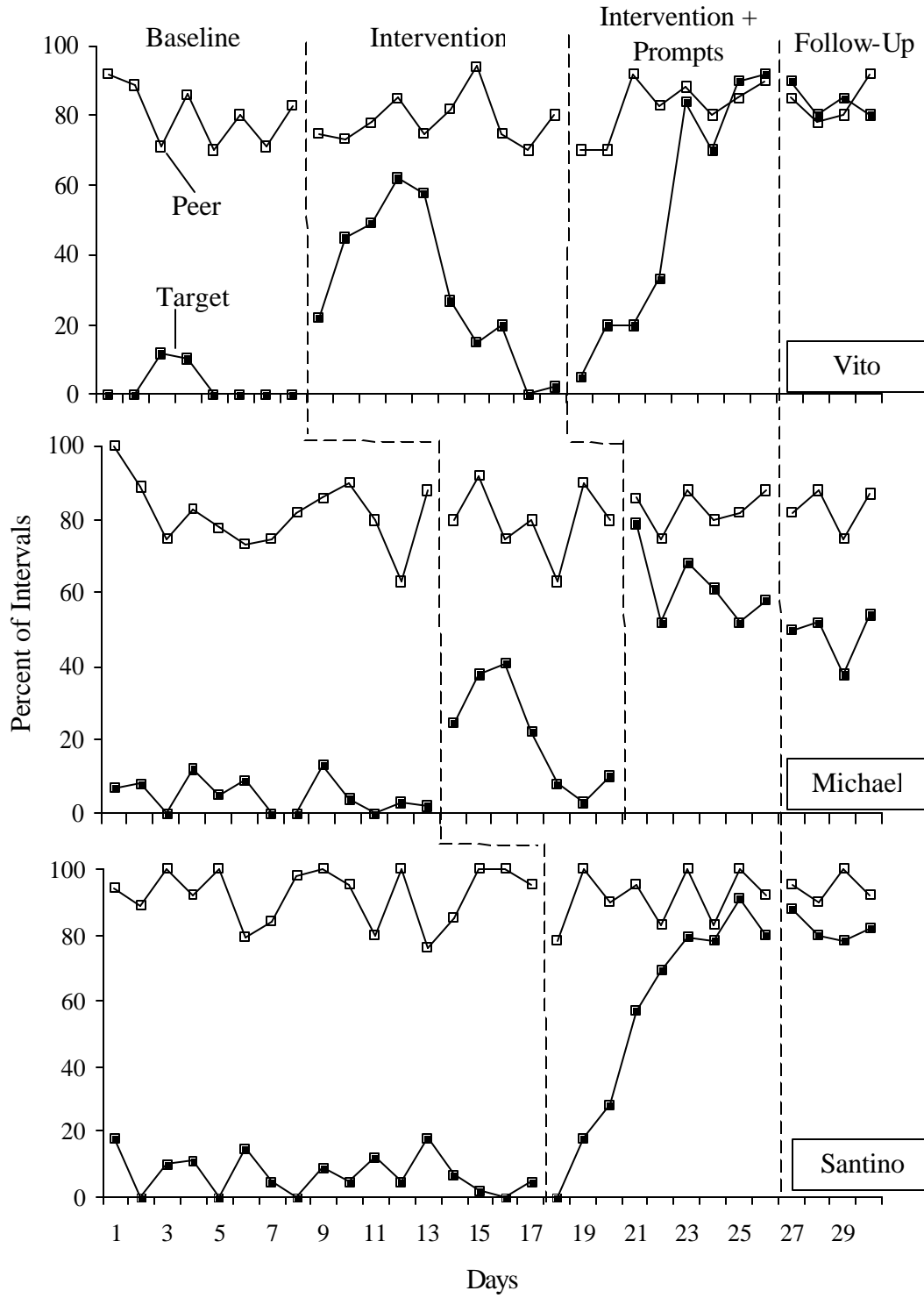
Vito

Figure 3 displays the percent of joining in behavior for Vito and comparison peers. The data show that over time, Vito approached peer levels of joining in behaviors. This was more evident at the end of the intervention plus prompts phase when the implementation of child confederates and prompting occurred (see Figure 3). In addition, a correspondence between Vito and peer behaviors is demonstrated at the end of the intervention period (see Figure 3). That is, once Vito's rates of behavior increased to a level comparable to his peers, his behavior demonstrates the same fluctuating trend. The same trends were also demonstrated during follow-up.

Mean levels of joining in for Vito with peer comparisons are displayed in Table 15. These data show that during the intervention plus prompts and maintenance periods, Vito's mean level of joining in approached the level of his peers. Specifically, during baseline there was a difference in rates of joining in between Vito and his peers of 77.5%. However, during the intervention period this difference decreased to 48.7%. After the intervention modifications were implemented, Vito continued to approach peer levels of behavior (differing by 30.5%). If only examining the final four data points during intervention plus prompts, Vito demonstrated similar and, at times, higher rates of joining in behavior than his peers (see Figure 3). Similar effects were demonstrated during follow-up. Specifically, Vito's mean level of joining in behaviors was the same as his peers (83.75%).

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Table 15

Mean Level of Joining In Behaviors for Vito with Peer Comparison

	M		SD	
	Vito	*Peer*	*Vito*	*Peer*
Baseline	2.75%	80.25%	5.12	8.71
Intervention	30.00%	78.70%	22.30	6.96
Intervention + Prompts	51.75%	82.25%	35.88	8.46
Follow-Up	83.75%	83.75%	6.24	4.79

Michael

Figure 3 displays the percent of joining in behavior for Michael and comparison peers. Similar to Vito's results, the data show that Michael approached peer levels of joining in behaviors over time. In addition, a correspondence between Michael and peer behavior was revealed, particularly during the intervention plus prompts phase. Although Michael's data do not maintain comparable levels to his peers, as was the case with Vito, a clear correspondence continued throughout the remainder of the intervention period (see Figure 3).

Mean levels of joining in for Michael and peers are displayed in Table 16. These data show that during the intervention period, Michael's mean level of joining in approached the level of his peers. Specifically, during baseline there was a difference in rates of joining in between Michael and his peers of 76.84%. However, during the intervention and intervention plus prompts phases this difference decreased to 59% and 21.5% respectively. At follow-up there was a 34.50% difference between Michael's rates of joining in when compared with peers.

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Table 16

Mean Level of Joining In Behaviors for Michael with Peer Comparison

| | M | | SD | |
	Michael	Peer	Michael	Peer
Baseline	4.85%	81.69%	4.62	9.35
Intervention	21.00%	80.00%	14.83	9.64
Intervention + Prompts	61.67%	83.17%	10.41	5.15
Follow-Up	48.50%	83.00%	7.19	5.94

Santino

Figure 3 displays the percent of maintaining conversation behaviors for Santino and comparison peers. The data show that over time, Santino approached peer levels of maintaining conversation behaviors. Similar to Vito and Michael, Santino's data also demonstrates a correspondence with peer behavior. This correspondence was more pronounced during the final three data points of the intervention phase and to some degree during the follow-up phase (see Figure 3).

Mean levels of active conversation maintenance for Santino and peers are displayed in Table 17. These data show that during the intervention and maintenance periods, Santino's mean level of maintaining conversations approached the peers' level. Specifically, baseline rates of conversation maintenance differed between Santino and his peers by 85%. However, during the intervention period this difference substantially decreased to 35.66%. At follow-up there was only a 12.25% difference between Santino's rates of maintaining conversations when compared with peers.

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Table 17

Mean Level of Maintaining Conversation Behaviors for Santino with Peer Comparison

	M		SD	
	Santino	*Peer*	*Santino*	*Peer*
Baseline	7.18%	92.18%	6.11	8.41
Intervention	55.56%	91.22%	32.30	8.35
Follow-Up	82.00%	94.25%	4.32	4.35

Participants' Social Communication Progress: Collateral Skills

The fifth research question was, *Do participants demonstrate increases in social interaction skills*? This question was answered through analysis of data collected from the Observation of Appropriate Social Interaction Skills (OASIS) form. These data were used to examine any collateral effects of the intervention for each participant. That is, information regarding social interaction skills beyond those targeted for intervention (e.g., eye contact, calling peers by their name, smiling) for each participant were compared across conditions to examine mean changes in the use of appropriate interaction skills, as well as any changes in the rates of these behaviors. Descriptive data for each participant are detailed in Table 18. Mean changes that were in the hypothesized direction appear in bold.

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Table 18

OASIS Descriptive Data for Each Participant

	M	*SD*	*Min.*	*Max.*
Vito				
Baseline	15.88%	11.75	0	33
Intervention	**21.67%**	13.44	7	42
Intervention + Prompts	**65.80%**	10.99	51	80
Follow-Up	**82.75%**	7.80	73	90
Michael				
Baseline	9.54%	4.46	0	13
Intervention	**14.67%**	17.55	0	47
Intervention + Prompts	**20.67%**	17.64	12	53
Follow-Up	**13.50%**	4.14	10	19
Santino				
Baseline	16.80%	9.34	7	27
Intervention	**48.00%**	24.88	7	73
Follow-Up	**85.50%**	4.04	82	91

These data demonstrate that all three participants displayed more appropriate social interaction skills following baseline conditions. Furthermore, there appeared to be some maintenance regarding the use of these appropriate social communication skills following the intervention. Specifically, both Vito and Santino displayed mean percentages of these skills higher than baseline conditions. However, the same effects were not observed for Michael. Although the percent of collateral social communication skills remained higher than baseline, Michael displayed decreasing rates of appropriate social interaction skills at follow-up.

When examined qualitatively, individual increases of social behaviors were identified. For example, Vito and Michael both demonstrated consistent increases in their

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ability to join in activities, call peers by their names, start conversations, and cooperate in group activities without prompting. Vito also demonstrated improved ability accepting peer ideas for group activities. For Santino, consistent improvements were identified in calling peers by their names, engaging in reciprocal conversations, and inviting others to join activities. In addition to these improvements, Santino demonstrated moderate progress in his ability to make eye contact and accept peer ideas for activities. Interestingly, no changes were observed in any of the participant's ability to ask "wh" questions or give compliments.

Intervention Acceptability

The final research question was, *Do teachers value video modeled Social Stories as acceptable interventions*? This question was answered though a descriptive analysis of data from the modified Intervention Rating Profile-15 (IRP-15; Martens & Witt, 1982). Scores on the IRP-15 range from 15 to 90, with higher scores indicating a greater acceptance level. Scores above 52.50 are considered acceptable (Von Brock & Elliot, 1987). For this study, scores on the IRP-15 were well within the acceptable range for all participants. Specifically, the score for Vito was 78, the score for Michael was 65, and the score for Santino was 71. Of particular notice, two teachers indicated that they "strongly agree" that this intervention was consistent with those used in classroom settings and they would be willing to use this intervention in classroom settings. In addition, each teacher indicated they "agree" that this intervention would be suitable for a variety of social skills deficits and that most teachers would find this intervention appropriate. Ratings for each item on the IRP-15 are provided in Table 19.

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Table 19

Ratings for Each IRP-15 Item

Item	Rater 1	Rater 2	Rater 3	*M*
1. This was an acceptable intervention for the child's social skills difficulties.	5	5	5	5.00
2. Most teachers would find this intervention appropriate for social skills problems for their students.	5	4	4	4.33
3. This intervention was effective in changing the child's social skill difficulties.	5	4	3	4.00
4. I would suggest the use of this intervention to other teachers.	5	4	4	4.33
5. The child's social skills difficulties were severe enough to warrant use of this intervention.	5	4	4	4.33
6. Most teachers would find this intervention suitable for a variety of social skills deficits.	5	5	5	5.00
7. I would be willing to use this intervention in the classroom setting.	6	6	5	5.67
8. This intervention would <u>not</u> result in negative side effects for the child.	6	5	3	4.67
9. This intervention would be appropriate for a variety of children.	5	5	5	5.00
10. This intervention is consistent with those I have used in classroom settings.	6	6	4	5.33
11. The intervention was a fair way to handle the child's social skills difficulties.	5	5	5	5.00
12. This intervention was reasonable for the social skills described.	5	5	4	4.67
13. I like the procedures used in this intervention.	5	4	5	4.67

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Table 19 (Continued)

Ratings for Each IRP-15 Item

Item	Rater 1	Rater 2	Rater 3	*M*
14. This intervention was a good way to handle this child's social skills difficulties.	5	4	4	4.33
15. Overall, this intervention would be beneficial for the child.	5	5	5	5.00

Note: The following scale was used on the IRP-15: *1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree.* Rater 1 = Vito's Teacher, Rater 2 = Michael's Teacher, Rater 3 = Santino's Teacher.

Summary of Findings

According to the multiple baseline design, increases in social communication for the three participants following the initiation of the video modeled Social Story interventions were demonstrated. While the data relative to Vito and Michael during the intervention phase demonstrated improvement with the addition of intervention modifications, data for Santino clearly demonstrated a positive response to the intervention. In addition, the initial effects of the data demonstrate that all three participants maintained an elevated performance of active behaviors at follow-up. Despite positive trends and maintenance of targeted skills, generalization only occurred for one participant following the initiation of the video modeled Social Story interventions. However, all three participants approached peer levels of performance, as well as increased use of collateral skills during target observations. Overall, each of the participants' teachers rated the interventions positively.

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Chapter V

Discussion

This chapter outlines the implications of the data relative to the research questions for the study. In addition, this chapter (a) outlines the significance of the current findings, (b) proposes implications for the development of video modeled Social Story interventions for children with High Functioning Autism/Asperger's Syndrome (HFA/AS), and (c) discusses potential considerations for future research in this area.

Impact of the Intervention

Observational Data

An intervention that combined Social Stories and video modeling showed positive effects in increasing specific social communication skills of the three participants. Immediately following the implementation of the visually mediated intervention, the participants demonstrated improved rates of targeted social communication behaviors compared to baseline performance. For Vito and Michael, skills began a rapid decline after a brief period of improvement. However, once treatment procedures were modified to include teacher prompting and child confederates, Vito and Michael regained skills that maintained throughout the remainder of the intervention period and during follow-up. Santino's data demonstrated a consistent positive improvement in targeted skills without the need for modifications. Regardless of these differences, all three participants demonstrated some short-term maintenance of target behaviors two weeks following the

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intervention. In addition, Vito demonstrated some generalization of skills to other settings across time. The same effects were not seen for Michael and Santino. When compared to their peers, all three participants' rates of behavior were equivalent to or approaching the same level of their peers, which demonstrates the clinical significance of the interventions. Interestingly, when peer comparison data were examined visually, each participant demonstrated a correspondence between their rates of behavior and that of their peers during intervention. That is, if peer data were observed to decrease/increase, each participant's behavior decreased/increased. This correspondence suggests that during the intervention and, to some degree during follow-up, each participant responded to naturally occurring social stimuli in a similar manner to their peers. Due to the individualized nature of the target behaviors, a brief summary of the results for each participant is provided.

A close look at the percentage of joining in data for Vito revealed a rapid increase following the implementation of the intervention. However, Vito's joining in behaviors began a steady decline after the fourth day of data collection during the intervention phase (see Figure 1). Anecdotally, it was observed that when Vito used his skill appropriately, other students either ignored him or walked away. Vito's teachers reported that similar events occurred on the days when data were not collected as well. It was hypothesized that Vito was not receiving reinforcement for using his skills appropriately. Without receiving social reinforcement for practicing the skill, whether natural (e.g., other children playing with him) or programmed (e.g., having the teacher prompt peers to reinforce appropriate behaviors on the playground), it is not surprising that Vito failed to

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ask to play/join. Because of the continued decline in previously acquired skills, intervention modifications (teacher prompting and child confederate) were implemented.

Following intervention modifications, Vito's rates of joining in behavior increased steadily. Unfortunately, data were not collected for a longer period of time during the intervention phase to examine if Vito's rates of joining in behaviors would stabilize at this level. However, data collected during the follow-up phase revealed a relatively consistent, increasing trend, suggesting maintenance of the targeted skill. Overall, these data reveal positive effects for Vito during the intervention plus prompts and follow-up conditions. Changes in mean, level, and slope were all in the hypothesized direction and percent of overlapping data points was low. These results indicated substantial improvement across conditions.

Over time, Vito also demonstrated generalization of skills to another playground setting as indicated by a steadily increasing trend across intervention and follow-up conditions (see Figure 2). However, the percent of his generalization of skills was not as elevated as his behavior in targeted settings, and appeared to be increasing at a slower rate. Perhaps what is most revealing regarding the effectiveness of the intervention is that Vito's level of joining in behaviors matched the level of comparison peers after the treatment modifications were implemented. A closer look at these data reveals a close correspondence between Vito's and comparison peers data (see Figure 3). Performing at, or near, the same level of peers suggests that Vito may have understood the perspectives of others and more readily read the social cues of others.

Similar results for Michael were found upon the implementation of the video modeled Social Story intervention. Specifically, data demonstrated initial positive effects

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followed by a rapid decline in previously acquired skills. Like Vito, it was noted anecdotally by data collectors and Michael's teacher that when he asked to play an activity or join in an existing game, other children either ignored him or ran away. When discussing this pattern with his teacher, she indicated that Michael has a history of negative interactions (e.g., hitting, grabbing people by their throat) with other students in his classroom. It was hypothesized that, in the past, Michael's peers may have been negatively reinforced for avoiding interactions during unstructured times. Or, like Vito, it may be that the lack of either natural or programmed social reinforcement led to a decline in his use of the target skill. Whatever the case may be, when the intervention modifications were implemented, change in mean, level, and slope of rates of joining in behavior demonstrated improvement. Closer inspection of Michael's data reveals a decline in active joining in behaviors after the initiation of the intervention modifications (see Figure 1). This decline was not as pronounced as prior to the intervention modifications and stabilized across the remaining intervention period. Due to time constraints, data were not collected over an extended period of time to monitor the target behavior after the modifications. However, increases in social communication maintained following the withdrawal of the intervention as indicated by the elevated rates of joining in behaviors at follow-up. In addition, the percent of overlapping data points across phases for Michael provides an indication of the impact of the intervention on the target behaviors. Specifically, percent of overlap was low across all conditions.

Generalization for Michael was less compelling. Only a brief initial gain was seen immediately following the implementation of intervention modifications (see Figure 2). However, generalization data quickly returned to near baseline levels and remained at

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this level during follow-up. During generalization, intervention modifications were not implemented. That is, there was neither teacher prompting nor confederates. However, when such modifications were implemented during the intervention plus prompts phase, Michael demonstrated substantial improvement in behavior. It is hypothesized that Michael may have had the expectation that another peer (confederate) would engage in the activity with him, providing him social reinforcement, when participating in other settings (generalization). However, when this did not occur, Michael may have engaged less because of a lack of reinforcement. Anecdotoal information provided by his teacher at the end of the study provided additional information regarding Michael's generalization of skills. For example, on one day in class, there was extra time to engage in free activities (e.g., read, play games). Michael picked up the *Candyland* game and walked around the classroom asking for another student to play with him. Like the playground setting, none of his peers engaged in the activity with him. When Michael finally asked to play with his teacher, she agreed and she provided him with reinforcement for asking to play appropriately. Not only does this demonstrate generalization of skills to new settings, but also suggests that conditions within the environment may need to be programmed to create social opportunities for ongoing practice.

Despite the lack of generalization, Michael's level of joining in behaviors approached the performance of comparison peers during the intervention period. Like Vito, Michael also showed a correspondence in behavior when compared to his peers. Interestingly, even though Michael's overall level differed from his peers, his behavior appeared to correspond well with that of his peers (see Figure 3). These results suggest

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that even with a lower level of performance, Michael appeared to respond to social cues in the environment in a similar manner as peers.

The results for Santino were more direct. Specifically, following the implementation of the video modeled Social Story intervention, Santino demonstrated an increase in the percentage of maintaining conversation behaviors. Changes in mean, level, and slope were all in the hypothesized direction and the percent of overlap was low (see Figure 1). Behaviors not only demonstrated increased performance during intervention, but also maintained at high levels during the two-week follow-up (see Figure 1). It is hypothesized that Santino's reaction to the intervention was different because of ecological variables present in his environment. For example, several girls from Santino's class attempted to interact with him. However, Santino often became frustrated and walked away to play by himself. By providing Santino the skills to maintain a conversation through the video modeled Social Story, it is likely that his peers provided him with immediate social reinforcement because they also were receiving social reinforcement from Santino (i.e., their conversation was reciprocated). Therefore, natural contingencies were already in place and teaching Santino how to actively maintain conversations was enough to promote increased use of the skill.

Despite an immediate response to the intervention and maintenance of skills, Santino's generalization of behaviors to other settings was not observed. In fact, his level of skills in generalization settings demonstrated consistent levels across all conditions (see Figure 2). However, generalization observations for Santino occurred during lunch. During this time, Santino's mother ate with him everyday. Because of this environmental variable, it is difficult to ascertain if Santino would have engaged in more maintaining

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conversations with his peers during lunch as he demonstrated during playground activities.

The overall results of the observational data demonstrate that the video modeled Social Stories showed positive effects for all three participants. 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 video modeled Social Stories were effective for improving and maintaining the rates of social communication for the participants, though modifications to allow access to social reinforcement was needed in two cases. However, even with modifications to the intervention, Vito and Michael still needed to engage in their targeted skill prior to being reinforced by their peers. Therefore, the addition of teacher prompted reinforcement does not take away from the value of the video modeled Social Story interventions.

Maintenance of Behaviors

Overall, maintenance data were encouraging. All three participants demonstrated maintenance of skills at a two-week follow-up. However, these results should be interpreted with caution for the following reasons. First, due to the modifications to the interventions that were made for Vito and Michael, data collection did not continue long enough for stable trends to be established during the intervention period. Because of this, the interventions may have been ended prematurely without sufficiently training

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communication skills to a proficient level. Premature removal of the intervention may lead to loss of treatment gains given continued maintenance data collection. This hypothesis underscores the importance of training new communication skills to proficient levels before assessing maintenance of acquired skills.

Second, the additional supports that were needed for Vito and Michael for the interventions to be effective indicate that some skills may be more difficult for some individuals with HFA/AS to sustain. Research has shown that impaired social functioning is negatively related to long term adjustment and prognosis for individuals with ASD (Matson & Swiezy, 1994) and individuals with emotional and behavioral disorders (Lewis, Hudson, Richter, & Johnson, 2004). Specifically, the absence of social competence (i.e., antisocial or odd social behavior) is associated with numerous negative outcomes such as unfavorable ratings of behavior by teachers and peers, as well as lower levels of peer acceptance. With this in mind, additional intervention variables (e.g., teacher reinforcement) may be necessary to maintain certain social communication behaviors, especially if histories of negative behaviors exist between peers and teachers. Therefore, it is difficult to determine if the intervention effects of this study may have been more evident and durable had training and subsequent practice, in conjunction with social reinforcement, continued for a longer period of time.

Generalization of Behaviors

Overall, generalization of skills across settings was not compelling. Although Vito demonstrated substantial improvement in the generalization of skills, the same effects were not observed for Michael and Santino. Despite the positive generalization results for Vito, these data should be interpreted with caution. Because Vito was observed

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in a similar playground setting during generalization assessment, it is possible that fairly restricted stimulus generalization occurred. That is, Vito's generalization may have been restricted to the narrow set of stimuli associated with the playground setting and may not have been observed in other settings where such behavior would be considered appropriate (e.g., in class free time). Therefore, Vito's generalization of skills may have been due more to the environment occasioning behavior than a true transfer of training across a variety of settings.

Improved generalization may have been facilitated in several ways. First, generalization may have been improved by incorporating more socially oriented activities (e.g., organized games) that require other children to play with children with the target participants. For example, a teacher may have his/her Kindergarten class play an organized group game (e.g., Red Rover) at the very beginning of recess that encourages all students to participate. By naturally providing support and direction, this may encourage relationships between typical developing students and individuals with HFA/AS. Second, more programmatic steps for facilitating generalization may be necessary. Steps to increase generalization may include incorporating techniques as suggested by Stokes and Baer (1977) or more systematic approaches to produce general case responding promoted by Albin and Horner (1987). As this study suggests, without training or programming contingencies, generalization of skills remains an elusive task.

Treatment Integrity and Intervention Acceptability

The video modeled Social Story interventions demonstrated adequate treatment integrity and were rated as highly acceptable by teachers. When working in applied settings (i.e., schools), variables such as teacher time and motivation can have a

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significant impact on the success or failure of interventions. Therefore, critically examining factors affecting treatment integrity and acceptability is of paramount importance (Gresham, 1989). Results of this study demonstrate the need for considering a combination of factors (e.g., time to implement interventions, complexity of the intervention) when implementing interventions in school settings. For example, the complexity of the intervention in this study was limited by providing teachers with a packaged intervention that contained all of the necessary components. At first, the Social Stories and video models were presented as separate interventions. That is, each participant's teacher or paraprofessional had to first present the Social Story and then show the video model on a TV/VCR. Despite the relative ease of implementing the intervention in this way, integrity of intervention implementation was compromised. Often, teachers indicated that it took too much time to vary the intervention modalities and often resulted in decreased attention to the other students. Because of this, both Social Stories and video models were presented on one computer program that the participant watched in the classroom. The only requirement was to have the child use the computer. Such a consideration may have increased the treatment integrity and acceptability of this study because it decreased the time and number of treatment agents required to implement the intervention. In addition, when discussing the interventions with the teachers prior to the study, many were already familiar with Social Stories. Only one of the teachers had heard of video modeling, but when all the teachers were presented with the positive outcome data (e.g., quick acquisition and generalization of skills), the combined intervention was perceived as effective and was readily accepted. Consideration of these factors may have been responsible for the high treatment integrity

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and intervention acceptability found in this study, *AND* underscores the importance of considering such factors when using interventions in naturalistic settings.

<div align="center">Significance of Findings</div>

The findings of this study contribute in several ways to the treatment efficacy literature for improving social communication skills of children with HFA/AS. First, this research demonstrates the potential benefits of using visual supports to teach new social communication skills to verbal children with autism spectrum disorders (ASD) who have the ability to read. However, it is difficult to conclude which visual strategies (Social Stories, video modeling) in the intervention were the most beneficial.

Second, this research demonstrates the potential benefits of using Social Story interventions to teach new prosocial behaviors to children with varied social communication skills. 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 previous findings of the efficacy of Social Stories used to teach appropriate social skill behavior to children with ASD (Noris & Dattilo, 1999; Theimann & Goldstein, 2001; Sansosti & Powell-Smith, in press; 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.

Third, this research provides additional support for the use of video modeling for individuals with ASD. Prior research has suggested video modeling is an effective strategy because it provides a consistent model for an individual to imitate. Evidence in support of this notion has been found when teaching play sequences (D'Ateno,

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Mangiapanello, & Taylor, 2003), perspective taking (Charlop-Christy & Daneshvar, 2003), conversational speech skills (Charlop & Milstein, 1989), and social initiations (Nikopoulos & Keenan; 2003a, 2003b) to children with ASD. Furthermore, video modeling has been suggested to lead to quicker acquisition and greater generalization of skills (Charlop-Christy, Loc Le, & Freeman, 2000). The results of this study are similar to these previous findings because the participants often imitated the social behavior that was presented by their video model. Specifically, the participants in this study used the same language as the video models, as well as some of the same vocal intonations. However, this study did not support earlier research by Charlop-Christy, Loc Le, and Freeman (2000) suggesting that video modeling is effective for promoting generalization.

Aside from the previous research, the impact of this study may be more significant for the research literature on improving social communication for children with HFA/SA because: (a) it employed experimental control, (b) it demonstrates how Social Stories may be implemented and used simultaneously with video modeling for teaching specific social skills to individuals with HFA/AS, and (c) it demonstrates how the use of an intervention package can be applied and evaluated under naturalistic conditions (e.g., school setting).

In many of the social communication 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

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take had no intervention occurred (Risley & Wolf, 1972). By employing a multiple

baseline design, this study had greater experimental control, and contributes to the much

needed empirical research examining the effects of social skills strategies for individuals

with HFA/AS in applied settings.

Second, this study demonstrates the utility of conducting functional assessments

prior to designing and implementing a video modeled Social Story intervention.

Functional assessments allowed for greater specification of the problematic social

situation that the Social Story and accompanying video model had as its focus, as well as

the salient features of the context and setting for the combined intervention. In essence,

there was a direct link of assessment data with the design and implementation of the

intervention.

Third, this study offers support for additional methods for implementing visually

mediated interventions for individuals with ASD. Only a limited number of studies have

investigated new ways to use readily available technology (e.g., school computers) to

implement multimedia social skill interventions (e.g., Silver & Oakes. 2001).

Furthermore, only one published study has presented a Social Story using a multimedia

format (e.g., Hagiwara & Smith Myles, 1999). Given the current advances in software

technology and educator's increased access to computers that come equipped with the

necessary programs, more research is needed. The need for more studies is especially

critical for individuals with ASD who often find computer games and instruments

naturally rewarding. To date, no study has combined Social Stories and video modeling

into one treatment package. In addition, other than the Hagiwara and Smith Myles (1999)

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study, research investigating varying social skills implementation strategies for individuals with HFA/AS is a new endeavor.

Fourth, this study offers a unique contribution to the research literature by comparing the target behavior of participants to that of typical peers. Incorporation of peer comparison data allows for a more objective method to evaluate the clinical utility of an intervention by comparing target behavior to a normative standard (e.g., peer behavior in classroom). Although target skills do not need to match exactly with peer comparison data, levels of skill attainment that approach peer levels would be considered clinically significant. To date, only Sansosti and Powell-Smith (in press) have employed such a comparison. However, comparing the rates of target behaviors with comparison peers has several important educational 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 ASD 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 communication. Without understanding how often typical peers engage in targeted behaviors (which may vary from setting to setting), not only is it difficult to determine what level signifies clinical significance (Sansosti, Powell-Smith, & Kincaid, 2004), but also to what level participants need to be instructed. Second, comparing the rates of target behaviors with those of comparison peers is essential for demonstrating participants' development of understanding social cues. That is, these data allow one to determine if the target child is responding to social cues and environmental stimuli. This concern is particularly salient when considering social communication and social behavior. That is, if target behaviors taught through a

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Social Story exceeded the behaviors of typical peers (and become socially unacceptable), the child with ASD may be ridiculed and/or bullied due to not fitting in with the social norms of the environment. By collecting peer comparison data, adjustments to the intervention can be made to either increase or decrease target skill levels to socially acceptable levels. Therefore, the use of peer comparison data not only provides a means for the evaluating the clinical significance of behavior change, but also provides an objective method for modifying the content of interventions to meet the needs of a particular environment.

Fifth, this research contributes to the literature base by providing evidence of collateral improvements of social skill behaviors as indicated by an observational checklist. 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 joining in or maintaining conversation behaviors, either directly or indirectly, more opportunities to participate in day-to-day social interactions may arise that will ultimately help children with HFA/AS to be accepted members of their school social network.

Finally, this study contributes to the development of evidence-based approaches for student support personnel (e.g., school psychologists, behavior analysts) working with individuals with HFA/AS. Recent epidemiological evidence showing rising numbers of individuals with ASD, combined with the likely inclusion of students with HFA/AS within general education classes, suggests that educators will be called upon to design and implement social skills interventions more frequently. Because Social Stories and

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video modeling procedures are developed with contextual fit in mind, they are good choices for use in school settings. Student support personnel stand at the forefront of assisting educators with the design, implementation, and evaluation of such interventions.

Implications for Practice

Several implications for practice can be gleaned from the implementation and results of this study. First, the time required and skills necessary to design a video modeled Social Story intervention should be considered. Writing a Social Story and adhering to the specifics set forth by Gray (1995) and Gray and Garrand (1993) may take some practice for those with no previous training. Specifically, educators may require additional training on how to conduct functional assessments prior to designing and implementing a Social Story. The purpose of functional assessments is to individualize the story to meet the specific needs of the student. Thus, completing a functional assessment correctly is an important component of this and similar interventions. In addition, educators may need more information regarding the types of sentences used, as well as the ratio of sentences used in a Social Story. Because Social Stories are designed for contextual fit in mind, each sentence will reflect information gathered from functional assessments. Furthermore, creating a video model that presents the targeted skill from the Social Story in an effective and attractive manner not only requires access to a high quality camera (preferably a digital camcorder), but also requires significant planning for the what, when, and how to video. Editing can complicate this process, and extra resources (e.g., media specialists) may be necessary for successful design of the video modeling portion. For this study, the primary investigator had access to digital video

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devices, as well as knowledge regarding video editing. Therefore, additional resources were not necessary for this study.

Second, developing a digital multimedia presentation that incorporates both Social Stories and video modeling into one program requires some advanced technical skills. However, because the interventions in this study were created using readily available software (i.e., PowerPoint), such skills can be acquired without significant amounts of training, if any is required at all. The multimedia intervention used in this study did not require special modifications of software or hardware, nor in-depth techniques to operate the computers. Moreover, once a routine was established for implementing the interventions, additional human resources were not needed. Thus, video modeled Social Story interventions have promising applicability to a variety of educational settings.

Third, once a video modeled Social Story has been created, consideration for who will be responsible for its implementation is in order. Because students with HFA/AS are often included in general education settings, there may not be enough teacher time to implement the video modeled Social Story intervention. Thus, additional implementation resources may be needed. Overall, an intervention consisting of a combination of Social Stories and video modeling is relatively easy to implement across many environments and is cost effective. Due to their ease of implementation, a variety of service personnel (e.g., teachers, school psychologists, guidance counselors, paraprofessionals) could implement video modeled Social Story interventions after they have been created. With access to other treatment providers, it is more likely that the interventions will be implemented as planned.

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Finally, when considering implementation, it is also important to examine the larger framework in which interventions are conducted. Recent educational reform movements advocate using more systematic, data-based methods for identifying and resolving academic and/or behavioral difficulties, or a Response to Intervention (RTI) approach (Gresham, 2004). In this approach, student support personnel need to monitor participant data and make changes to the intervention when student outcomes are not in the hypothesized direction, as occurred in the present study. This approach may be considered time-consuming and require more sophisticated problem-solving skills by support staff. Thus, subsequent consideration of training in data collection procedures and data-based decision making may be necessary. However, by incorporating the RTI approach into practice, a greater likelihood of student success exists.

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

Although this study contributes much to the existing literature, it does have limitations. A primary limitation in this study involved the combination of Social Stories and video modeling into one treatment package. By combining Social Stories and video modeling into one treatment package, information regarding the effect of each strategy on increasing the social communication skills of children with HFA/AS could not be assessed. That is, this study did not parcel out the individual contributions of each intervention approach, nor compare these interventions and offer evidence as to which had the greater impact on student outcomes.

Similar to the limitation regarding the individual contribution of the two strategies, the amount of social reinforcement for each participant in their respective environments was not assessed. That is, the rates of social consequences coming from

peers and teachers were not evaluated. Given the hypotheses for Vito and Michael regarding social reinforcement, this variable may be essential when examining intervention success for individuals with HFA/AS. Without such information, it is difficult to determine if social reinforcement, or lack thereof, is necessary for continued success.

Finally, as with most small *N* or single-subject research, some caution must be taken in generalizing these findings across students, settings, or other behaviors. Also, the generalizability of the treatment effects to children of other disability types (e.g., mental handicaps) is not known 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 communication skills of individuals with HFA/AS. However, through direct and systematic replication of this study, the generality of the findings may be increased. In particular, systematic replication will add to the external validity of the treatment effect by showing that similar results can be obtained under varying conditions (e.g., other populations, other target behaviors).

Recommendations for Future Research

The fundamental concern for future research on the effectiveness of interventions for individuals with HFA/AS should be the continued use of procedures and methods that employ experimental control (Sansosti, Powell-Smith, & Kincaid, 2004). 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 provides further validity to the practice of using video modeled Social Stories (or other such interventions) for children with

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HFA/AS. More importantly, recent trends in educational practice suggest a need for increased evidenced-based approaches verified through well-controlled research paradigms. Continued efforts using research designs that lack the rigor of experimental control limit the acceptability of using such interventions in clinical practice. Thus, replication of this study and others that employ experimental control is important.

In addition to demonstrating experimental control, future research endeavors should further examine training for maintenance and generalization of skills. Training for maintenance and generalization is especially important for populations of children with ASD. Many studies have demonstrated that students with ASD 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). It was hypothesized that the video modeling portion of the intervention would increase the generalization of skills because such results have been demonstrated previously (e.g., Charlop-Christy, Loc Le, & Freeman, 2000). However, generalization was not found. Thus, more programmatic generalization methods likely are necessary for generalization to occur. Future research should attempt to promote generalization by providing training with a variety of examples through a variety of lessons, or training with sufficient exemplars (Stokes & Baer, 1977). One technique to promote generalization by using sufficient exemplars is general case programming (e.g., Albin & Horner, 1988; Becker & Engelmann, 1978). General case programming not only emphasizes using sufficient examples of stimuli and response settings, but also sequences for positive and negative teaching examples to ensure that a student will be able to perform a skill in a variety of

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situations. For example, if an educator wanted to teach a student with HFA/AS appropriate greeting behavior, the educator would have to determine what variations in greeting existed (e.g., words to use to say hello to familiar and unfamiliar adults or other children) and provide training in the various settings (e.g., school, home, community) that have these variations. With this in mind, more time may be needed to teach various social skills so systematically. However, such programming is likely to teach functional skills that the child can use in a variety of educational and community settings. Furthermore, the use of simulations, including those provided by videotape, may enable educators to train more exemplars without requiring significant amounts of teaching time.

Future research should also begin the process of delineating the effective components of combined treatment interventions. For example, future research could identify the impact of Social Stories and video modeling implemented alone versus the impact of Social Stories used in combination with video modeling. In addition, future research should investigate the importance, if any, of other variables outside of Social Stories and/or video modeling necessary for skill attainment and maintenance. For example, reinforcement contingencies for engaging in appropriate target behavior may be necessary for some participants. Specifically, as was discovered in this study, some individuals using video modeled Social Stories may not be immediately reinforced by peers or adults for practicing and/or 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 or they may be ignored by peers. By providing additional supports such as prompts, reinforcers, and/or child confederates, it may be possible to jumpstart the relationship between the content of video model Social Stories and social behavior, as well as create ongoing

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social opportunities for practice of the target skill. Eventually, these initial opportunities may later promote more spontaneous initiations of the target behavior that are then socially reinforced (i.e., naturally occurring reinforcement).

Additional research endeavors could also examine the differential benefits of participation in a video modeled Social Story intervention with variable treatment duration (i.e, length of intervention) or frequency (i.e., number of times participant views the video modeled Social Story). Such research may be useful because some social skills may require more instructional time to bring a student with HFA/AS to a level of adequate proficiency or greater opportunities for practice the targeted skill. Therefore, studies examining the effects of varied instructional variables could verify the hypothesis that increasing the duration and/or frequency of a video modeled Social Story intervention may result in larger treatment benefits, benefits to more participants, or greater maintenance of treatment effects.

Finally, additional research is necessary on the differential effects of Social Story interventions for children with various diagnoses on the autism spectrum (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. 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.

In considering avenues for future research, it is important not to rule out potentially beneficial methodologies. In the past, single-subject studies have been a

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mainstay of Social Story research (Sansosti, Powell-Smith, & Kincaid, 2004). As an alternative to single-subject research, group designs might offer a way to easily manipulate variables for each experimental group and draw conclusions about the efficacy of different intervention configurations (e.g., reinforcement, implementation modality, duration, frequency, etc.). However, the highly individualized nature of ASD makes creating large groups with homogeneity of variance challenging. For group research, larger populations are necessary for increasing the power of findings. Gaining access to a large population of children with HFA/AS may prove difficult. In addition, the individualized nature of Social Stories and video modeling would pose a challenge for group design research. Typically, Social Stories and video modeling interventions are designed specifically for individual cases. With larger samples, greater efforts to adhere to the specific requirements of Social Story and video modeling procedures would be necessary to ensure reliable treatment implementation. Therefore, a substantial amount of financial and personnel resources would likely be necessary to meet these empirical demands. Despite these considerable obstacles, group research offers a mechanism for manipulating and delineating the specific components of Social Stories and video modeling that render them effective. If these methodological challenges could be overcome, this type of research could add considerably to the existing literature base on video modeling and Social Story interventions.

Summary

In summary, this study investigated the effects of video modeled Social Story interventions for three children with HFA/AS. Together, the results of this study support previous positive findings regarding the use of Social Story and video modeling

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interventions for children with autism. In addition, the results of this study support clinical recommendations for using Social Story interventions in combination with other methods 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 video modeled Social Story interventions with children with HFA/AS, this information should be used to assist with the development of such interventions, as well as provide the foundation for future research. The present research provides no definitive claims of the effectiveness of a combined intervention for children with HFA/AS. Rather, it adds preliminary evidence that a combined intervention that teaches social communication skills and provides for a model of appropriate behavior may be a beneficial method of remediating social skill difficulties for many children and youth with HFA/AS.

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Appendices

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Appendix A

DSM-IV-TR 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's disorder or childhood disintegrative disorder.

Appendix B

DSM-IV-TR 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.

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*

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Appendix D

Social Story for Vito

<u>Page 1:</u>

After morning work, we go outside for recess.

Sometimes, recess in on the playground.

<u>Page 2:</u>

Recess is a time that I can go to the playground.

I can walk and run and talk out loud.

<u>Page 3:</u>

Most of the time, I like to play with my friends.

Most of my friends like to play too.

<u>Page 4:</u>

Sometimes, I have no one to play with.

<u>Page 5:</u>

I can ask some of my friends to play with me.

I can do this by asking, "Can I play with you?"

<u>Page 6:</u>

If they say yes, I can say, "Great, Let's Play!"

<u>Page 7:</u>

If I don't know how to play I can say, "How do you play?"

This is a good idea.

<u>Page 8:</u>

My friends will show me how to play.

This will make me happy.

<u>Page 9:</u>

When I join in and play, I feel like I have friends.

<u>Page 10:</u>

As long as I keep asking to play, I will have a lot of friends.

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Appendix E

Social Story for Michael

Page 1:

>   After morning work, we go outside for recess.

>   Sometimes, recess in on the playground.

Page 2:

>   At recess, I like to play with my friends.

>   Most of my friends like to play too.

Page 3:

>   The most fun I have is when I play tag.

Page 4:

>   Sometimes, I don't know who wants to play tag.

Page 5:

>   If I want to play tag, I can ask my friends to play with me.

>   This is a nice thing to do.

Page 6:

>   I can ask my friends to play tag by saying, "Do you want to play tag?"

Page 7:

>   If my friends say "yes" I can say, "Great, let's play"

Page 8:

>   When I play tag at recess, I feel like I have friends.

Page 9:

>   If I keep asking my friends to play tag, I will have a lot of friends.

Appendix F

Social Story for Santino

<u>Page 1:</u>

After lunch, we go to recess.

Sometimes, recess is on the playground.

<u>Page 2:</u>

Recess is a time that I can go outside.

I can walk and run around, or I can talk to my friends.

<u>Page 3:</u>

Most of the time during recess, I like to talk to my friends.

<u>Page 4:</u>

When I see a friend on the playground, I can smile and say "hello."

My friends like it when I smile and say Hello to them.

<u>Page 5:</u>

When my friends are talking, I should try to listen and look at a part of their face.

This is a very nice thing to do.

<u>Page 6:</u>

When I am talking, I should try not to walk away unless I am asked to do so.

<u>Page 7:</u>

If I walk away, I will hurt my friend's feelings and they will think I don't care
about them.

I would be hurt if my friends walked away from me when talking.

<u>Page 8:</u>

When I am talking to my friends at recess, I should try to look at a part of their
face and listen to what they say. This will make my friends happy.

<u>Page 9:</u>

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

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Appendix G

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												
AbBx												

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

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

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

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

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

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

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

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

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

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

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

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Appendix H

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 _____

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Appendix I

Intervention Rating Profile –15 (IRP-15)
Adapted from Brian K. Martens & Joseph C. Witt (1982)

The purpose of this questionnaire is to obtain information regarding your acceptance of the intervention. Such information will aid in future selection of classroom interventions for students with autism spectrum disorders. Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1=strongly disagree	2=disagree	3=slightly disagree	4=slightly agree	5=agree	6=strongly agree

1. This was an acceptable intervention for the child's social skills difficulties.

   1   2   3   4   5   6

2. Most teachers would find this intervention appropriate for social skills problems for their students.

   1   2   3   4   5   6

3. This intervention was effective in changing the child's social skill difficulties.

   1   2   3   4   5   6

4. I would suggest the use of this intervention to other teachers.

   1   2   3   4   5   6

5. The child's social skills difficulties were severe enough to warrant use of this intervention.

   1   2   3   4   5   6

6. Most teachers would find this intervention suitable for a variety of social skills deficits.

   1   2   3   4   5   6

7. I would be willing to use this intervention in the classroom setting.

   1   2   3   4   5   6

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8.   This intervention would <u>not</u> result in negative side effects for the child.

      1   2   3   4   5   6

9.   This intervention would be appropriate for a variety of children.

      1   2   3   4   5   6

10.   This intervention is consistent with those I have used in classroom settings.

      1   2   3   4   5   6

11.   The intervention was a fair way to handle the child's social skills difficulties.

      1   2   3   4   5   6

12.   This intervention was reasonable for the social skills described.

      1   2   3   4   5   6

13.   I liked the procedures used in this intervention.

      1   2   3   4   5   6

14.   This intervention was a good way to handle this child's social skills difficulties.

      1   2   3   4   5   6

15.   Overall, this intervention would be beneficial for the child.

      1   2   3   4   5   6

Joining In Response Definitions

Active Joining In (AJI):

Definition: Instances in which the target participant actively initiates or participates in some play activity or conversation with one or more children. Displays of AJI should demonstrate awareness of group interactions and appropriate ways to ask to participate.

Examples of AJI:
▪ Requesting attention or acknowledgment from peers verbally (e.g., saying "Hey," or "Look" or calling peer's name) or gesturally to establish joint attention (e.g., taps peer on shoulder, hold an object up to show peers).
▪ Verbally initiating a new idea or topic that relates to the ongoing joint activity.
▪ Borrowing or lending toys, using each other's toys, or sharing accomplishments (e.g., successfully building a tower with blocks).
▪ 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).
▪ Compliments a peer (e.g., "You did it!") or expresses enjoyment to the peer regarding the interaction (e.g., "This is fun!").

Nonexamples of AJI:
▪ 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 (NAbJI).
▪ Walking up and observing without actively joining in.
▪ Playing independently and separately from peers (NAbJI).
▪ Not responding to his or her name being called by another peer

Negative or Absent Joining In (NAbJI):

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

Examples of NAbJI:
▪ 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.
▪ Refusing to share toys on the playground.
▪ Not using or sharing any of the toys with peers.
▪ Aimlessly walking around a peer group talking to himself and not initiating.
▪ Not responding to his or her name being called by another peer.

Nonexamples of NAbJI:
▪ Verbally initiating a new idea or topic that relates to the ongoing joint activity (AJI).
▪ Confirming or clarifying a request from another peer (e.g., "What did you want to play?").
▪ Playing any kind of organized group game (e.g., soccer, football, tag).

Maintaining Conversations Response Definitions

<u>Active Maintaining Conversations (AMC):</u>

Definition: Instances in which the target participant actively contributed to a reciprocal conversation or attended to a topic of conversation with one or more children. Displays of maintaining conversation should demonstrate awareness of the topic of conversation.

Examples of AMC:
- Making "small talk" with another peer (e.g., did you see the football game yesterday?).   - Playing next to each other and using a variety of social exchanges to show recognition of peers (e.g., talking to a peer about a game that is being played on the playground).   - Providing a comment following a 3-second interval after a peer's last utterance (Talking about information heard from a peer in the conversation).   - Listening to an ongoing conversation and showing approval (e.g., nodding).   - Answering a peer's question.   - Confirming or clarifying a question or comment from a peer (e.g., "What did you say?").
Nonexamples of AMC:
- Walking away from an ongoing conversation.   - Changing the topic of conversation to something unrelated (NAbMC).   - Not responding to his or her name being called by another peer.   - Complimenting a peer or expressing enjoyment in an activity ("This is fun!").

<u>Negative or Absent Maintaining Conversations (NAbMC):</u>

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

Examples of NAbMC:
- Interrupting a peer to introduce a new topic that has not been discussed previously.   - Making verbalizations with bizarre content, such as delayed echolalia consisting of dialogue from a television show (AbSE).   - Making animal noises, perseverative utterances (considered perseverative if repeated three or more times), and/or other vocalizations that were non-interactive in nature (e.g., singing).   - Changing the topic of conversation to something unrelated to and noncontingent upon on the peer's prior utterance.
Nonexamples of NAbMC:
- Playing independently and separately from peers.   - Answering a peer's question or responding to a comment (AMC).   - Walking up to a group of peers and listening, but not engaging in conversation.   - Playing in a group game and using gestures or vocalizations to share emjoyment (AMC).

Appendix L

Parent Consent Form

Parental Permission (Parental Consent)

Social and Behavioral Sciences
University of South Florida

Information for Parents who are being asked to allow their child to take part in a research study

The following information is being presented to help you decide whether or not you want to allow your child to be a part of a research study. Please read this carefully. If you do not understand anything, ask the person in charge of the study or the person obtaining your consent.

Title of research study: Using Video Modeled Social Stories to Increase the Social Communication Skills of Children with High Functioning Autism/Asperger's Syndrome

Person in charge of study: Frank J. Sansosti, M.A.

Where the study will be done: Pasco County School District

General Information about the Research Study

The purpose of this research study is to determine if the use of video modeled Social Stories with children with High Functioning Autism and/or Asperger's Syndrome increases the social communication skills of children who use them. This research is also part of a doctoral research requirement for the principal investigator listed above.

Your child is being asked to participate because s/he has a diagnosis of High Functioning Autism/Asperger's Syndrome and may provide us with information regarding the effectiveness of video modeled social story interventions.

Plan of Study

Your child will have one, individually designed Social Story that s/he will read on a daily basis at school. The principal investigator will develop this story based on information you provide regarding areas of need you feel your child would benefit from the intervention.

After the Social Story has been created, the contents of the story will be role-played on a video. The model in the video will be your child's teacher. The teacher will act out the contents of the Social Story, emphasizing appropriate responses to social situations.

At school, your child will read his/her Social Story and then watch the video model using the content from the story with a teacher. This process will only take approximately five minutes. After your child has read the story and viewed the video model, s/he will engage in normal everyday activities.

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Observations of your child's public social behavior will occur at school during unstructured activities, such as recess, lunch, or physical education classes. At no time will the normal school routine be disrupted for your child, nor will your child be singled out during the observations. Observations will continue for the entire spring semester of the 2004-2005 school year (approximately 15 weeks). Observations will occur two times per week and will last approximately 15 to 20 minutes. At the end of the study, your child's teacher will be asked to complete a questionnaire regarding the impact of the intervention. This questionnaire will consist of items asking if the intervention help your child and whether the teacher would select this intervention for other students in the future.

Payment for Participation
You or your child will not be paid for your child's participation in this study.

Potential Benefits of Taking Part in this Research Study
1. By taking part in this research study, your information may have the increased benefit of increasing our overall knowledge of how effective video modeled Social Story interventions are for children with High Functioning Autism/Asperger's Syndrome.
2. By taking part in this research your child(ren) with High Functioning Autism/Asperger's Syndrome may benefit by increasing his/her social cognitive and interpersonal skills, which may allow him/her to share more social successes.
3. This project may be used in the future as a resource for addressing the academic and social needs of children with High Functioning Autism/Asperger's Syndrome, as well as serving as a bridge to the current research-practice gap in school settings.
4. This research study may allow educators, families, and other persons directly related to a child with High Functioning Autism/Asperger's Syndrome to advocate for the increased use of social story interventions in settings outside of the home.
5. This research study may be a the foundation for a series of future related studies examining the efficacy of various interventions for children with High Functioning Autism/Asperger's Syndrome, moving from the preliminary efforts proposed here of demonstrating differential effects of video modeled Social Story interventions, toward research identifying more specific factors associated with positive outcomes.

Your child may not be helped by taking part in this study. However, there may be improvements in your child's social development. Even if successful, this treatment will not be a "cure" for High Functioning Autism/Asperger's Syndrome.

Risks of Being a Part of this Research Study
There are no known risks or side effects to participating in this study.

Confidentiality of Your Child's Records
You and your child's privacy and research records will be kept confidential to the extent of the law. We will keep the records of this study private by **not** putting your child's name on any of the study materials. Each person participating in the study will be given

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an identification number. Only these numbers, and not names, will be used to identify each participant's questionnaires and observational data.

However, certain people may need to see your child's study records. By law, anyone who looks at your child's records must keep them confidential. The only people who will be allowed to see these records are:

- The study staff.
- People who make sure that we are doing the study in the right way. They also make sure that we protect your child's rights and safety:

  A. USF Institutional Review Board (IRB) and their staff

  B. Others may include:

  People at USF who oversee research; and the

  United States Department of Health and Human Services (DHHS)

No member or employee affiliated with your child's school will have access to your child's data. To ensure confidentiality, all data will be kept in a secure, lockable filing cabinet.

The results of this study may be published. However, the data obtained from your child will be combined with data from other children in the publication. The published results will not include your child's name or any other information that would personally identify your child in any way.

Volunteering to Take Part in this Research Study

Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this research study or to withdraw him/her at any time. If you choose not to allow your child to participate or if you remove your child from the study, there will be no penalty or loss of benefits that you or your child are entitled to receive. Participation in or removal from treatment will not result in any penalty to your child's education.

Questions and Contacts

- If you have any questions about this research study, contact the Principal Investigator, Frank J. Sansosti, at 813-431-3826, or the Co-Principal Investigator (Major Professor) Kelly A. Powell-Smith, at 813-974-9698.
- If you have questions about your child's rights as a person taking part in a research study, you may contact the Division of Research Compliance of the University of South Florida at (813) 974-9343.

Consent for Child to Take Part in this Research Study

I freely give my permission to let my child take part in this study. I understand that this is research. I have received a copy of this consent form.

_____ _____ _____
Signature of Parent   Printed Name of Parent   Date
of child taking part in study

_____ _____ _____
Signature of person   Printed Name of person   Date
obtaining consent   obtaining consent

Statement of Person Obtaining Informed Consent:

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

_____ _____ _____
Signature of person   Printed Name of person   Date
obtaining consent   obtaining consent

Child's Assent Statement

Frank J. Sansosti has explained to me this research study called
Using Video Modeled Social Stories to Increase the Social Communication Skills of
Children with High Functioning Autism/Asperger's Syndrome

I agree to take part in this study.

_____	_____	_____
Signature of Child taking part in study	Printed Name of Child	Date

Signature of Child
taking part in study   Printed Name of Child   Date

_____   _____   _____

Signature of Parent
of child taking part in study   Printed Name of Parent   Date

_____   _____   _____

Signature of person
obtaining consent   Printed Name of person   Date
                                              obtaining consent

_____   _____   _____

Signature of Witness [Optional]   Printed Name of Witness   Date

If child is unable to give assent, please explain the reasons here:

_____   _____   _____

Signature of Parent
of child taking part in study   Printed Name of Parent   Date

_____   _____   _____

Signature of person
obtaining consent   Printed Name of person   Date
                                              obtaining consent

_____   _____   _____

Signature of Witness [Optional]   Printed Name of Witness   Date

Appendix M

Functional Assessment Interview Form
(adapted from O'Neill et al., 1997)

Individual's Name:	_____	DOB:	_____	Gender:	M F
Date of Interview:	_____	Interviewer:		_____	
Respondent(s)	_____	School/Agency:		_____	

A. DESCRIBE THE BEHAVIORS

Behavior (described in specific terms)	Frequency	Duration	Intensity

B. DESCRIBE SETTING EVENTS THAT INFLUENCE/PREDICT BEHAVIORS

____	Medical/Physical	____	Lack of Sleep	____	Eating/Diet
____	Hunger/Thirst	____	Medication	____	Weather Conditions
____	Parties/Social Events	____	Change in Schedule/Routine	____	Sensory Events (e.g., lights, noise, etc.)
____	Other factor(s) (Describe):				

C. WHAT HAPPENS BEFORE THE BEHAVIOR

- Specific activities or routines at school/home in which behavior(s) is most likely and least likely to occur (e.g., reading group, doing independent work, making transitions, recess, etc.)

MOST LIKELY   LEAST LIKELY

Appendix M (Continued)

- Times of day when behavior(s) is most likely and least likely to occur:

    <u>MOST LIKELY</u>   <u>LEAST LIKELY</u>

- People with whom behavior(s) is most likely and least likely to occur:

    <u>MOST LIKELY</u>   <u>LEAST LIKELY</u>

- Environmental events in which behavior(s) is most likely and least likely to occur
  (demands, termination of preferred activities, number of people in room, etc.):

    <u>MOST LIKELY</u>   <u>LEAST LIKELY</u>

- Cirucumstances in which the behavior(s) ALWAYS occurs? Describe:

- Circumstances in which the behavior(s) NEVER occurs? Describe:

- Skill deficits to which the behavior(s) may be related (e.g., communication, difficulty
  of task, processing, sensory).

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D. WHAT HAPPENS AFTER THE CHALLENGING BEHAVIOR(S)			
Behavior	**Response from Others**	**Does the individual obtain anything?**	**Does the individual escape/avoid anything?**

E. COMMUNICATION

What communication skills or behaviors does the individual use to get objects, activities, breaks, etc.? What would be the desired replacement behavior?

Challenging Behavior	**Replacement Behavior**

What communication skills or behaviors does the individual use to get out of or avoid objects, activities, people, etc.? What would be the desired replacement behavior?

Challenging Behavior	**Replacement Behavior**

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F. DESCRIBE THE EFFICIENCY OF THE CHALLENGING BEHAVIORS

What amount of physical effort is involved in the behavior(s) (e.g., prolonged intense tantrums vs. simple, verbal outbursts, etc.)?

_____

_____

Does engaging in behaviors result in a "payoff" (getting attention, avoiding the task) every time? Almost every time? Once in a while? Explain.

_____

_____

How much of a delay is there between the time the individual engages in the behavior and gets the "payoff?" Is it immediate, a few seconds, or longer?

_____

_____

G. INFORMATION ABOUT THE INDIVIDUAL

List previous techniques/strategies that have been used to try decrease/increase behavior(s).

_____

_____

_____

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List things that are reinforcing for the individual.

- **Preferred Food(s)**

  _____

  _____

- **Preferred Activity(ies)**

  _____

  _____

- **Preferred People**

  _____

  _____

- **Preferred Objects/Toys/Games/Materials**

  _____

  _____

Any other pertinent information about the individual not addressed in the interview.

_____
_____
_____

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Appendix N

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:*_____

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Observation

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

*Notes:*_____

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* Future Education , *The Social Story Book 1994*

Appendix O

Social Story Validity Checklist

Reviewer Name: _____   *Social Story Author:* _____
*Social Story Title:*_____

Directions: Please review the attached social story. Categorize each sentence into one of the following sentence types. Then complete the following sections.

I. Sentence Counts

1. How many sentences were there of each of the following categories?

Required Sentences	**Additional Sentences (not required)**
_____ Descriptive	_____ Control
_____ Perspective	_____ Cooperative
_____ Directive	
_____ Affirmative	

2. How many <u>total sentences</u> were there in the social story? _____

II. Sentence Ratio

3. Does the story contain any Control or Cooperative sentences?   _____ Yes   _____ No

If you answered Yes to the above question, go on to complete #4.
If you answered No, go on to #5.

4. If you answered Yes to #3, complete the following:

_____ Total number of Descriptive, Perspective, Affirmative and Cooperative statements

_____ Total number of Directive and Control statements

Does the story meet the Complete Social Story Ratio: 2-5 Descriptive, Perspective, Affirmative, and Cooperative sentences for every Directive or Control sentence? _____ Yes   _____ No

5.   If you answered No to #3, complete the following:

_____ Total number of Descriptive, Perspective, and Affirmative statements
_____ Total number of Directive statements

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Does the story meet the Basic Social Story Ratio (2-5 Descriptive, Perspective, Affirmative sentences for every Directive sentence)? _____ Yes _____ No

III. **Validity of Sentences**
The following is a list of characteristics for each sentence type. Review each sentence type and determine if the sentences in this social story meet these criteria.

Do ALL of the *Descriptive* sentences…	
…explain the who, what, when, where, and why of a social situation?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

Do ALL of the *Perspective* sentences…	
…describe the reactions and/or feelings of others?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

Do ALL of the *Directive* sentences…	
… identify a desired social skill or behavioral response cue?	___Yes ___No
… use phrasing that emphasizes effort (e.g., "I will try to…" or "I will work on…" (rather than phrasing that merely states behavior, such as "I will…")?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

Do ALL of the Affirming sentences…	
… either reference a rule/law, stress an important point, or reassure?	___Yes ___No
… immediately follow a Descriptive, Perspective, or Directive sentence?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

Do ALL of Cooperative sentences…	
… identify what others will do to assist the individual?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

Do ALL of the Control sentences…	
… reflect individual interests of participant to aid in recall of story?	___Yes ___No
If you answered no, please describe which sentences do not meet this criteria and why not.	

IV. Additional Questions

Were all the required elements included in the Social Story?

_____

_____

_____

Were any elements omitted from the Social Story?

_____

_____

_____

Any additional comments?

_____

_____

_____

Thank you for your time and effort in evaluating this social story!

Appendix P

Video Modeling Validity Checklist

Participant ID: _____   Length of   _____
                                        Video:

Target Bx:

Directions: Please review the accompanying video model. Put a check mark to each item that you observed in the video model.

Basic Camerawork

____ Auditory distractions (e.g., noisy appliances) are limited and it is easy to hear the model.

____ Visual distractions are limited by zooming in on the model or object.

____ Video is steady and movements are made slowly.

Acting

____ Models present material in a natural manner (e.g., voices are not exaggerated).

____ Models appear lively and expressive.

____ Models present each aspect of a multi-step activity clearly.

Content of Video Model

____ Target behavior is demonstrated in a clear and concise manner.

____ Target behavior clearly demonstrates expected behavior(s).

Were all the required elements included in the video model?

_____

_____

_____

Were any elements omitted from the video model?

_____

_____

_____

Any additional comments?

_____

_____

_____

Thank you for your time and effort in evaluating this video model!

Appendix Q

Treatment Fidelity Checklist

Procedures Checklist

Check off each numbered item for the student

1. _____ Room is available for student.

2. _____ Social Story is readily accessible for the student.

3. _____ Videotape is cued to the correct starting point.

4. _____ Child reads, or is read, the Social Story.

5. _____ Comprehension questions are asked after child reads the Social Story.

6. _____ Child watches video model immediately after reading the Social Story.

7. _____ Child immediately goes to the target situation (e.g., playground).

About the Author

Frank J. Sansosti received a Bachelor's of Science (B.S.) degree in Psychology from the University of Pittsburgh in 1998. While completing this degree, Mr. Sansosti was a research assistant for the ADD Program and the Pitt Mother and Child Project. In addition, Mr. Sansosti received training at the Child Development Unit (CDU) at Children's Hospital of Pittsburgh. After receiving his B.S. degree, Mr. Sansosti continued working at the CDU and was actively involved in the autism treatment program. In the fall of 2000, Mr. Sansosti entered the Ph.D. program in School Psychology at the University of South Florida.

While in the Ph.D. program, Mr. Sansosti remained active in research, assisting with the design, implementation, and evaluation of several nationally and locally funded projects. Mr. Sansosti earned his Master of Arts (M.A.) degree in School Psychology in 2001 and completed his Education Specialist (Ed.S.) thesis in 2003. In addition to these activities, Mr. Sansosti has coauthored several publications and has made a variety of presentations at both regional and national conferences.