

SUPERHERO SOCIAL SKILLS FOR CHILDREN WITH AUTISM  
SPECTRUM DISORDERS: COMPARING VIDEO-BASED  
INSTRUCTION TO TRADITIONAL DIDACTIC  
INSTRUCTION

by

Keith C Radley III

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## ABSTRACT

The current study compared the efficacy of video-based social skills instruction for children with autism to traditional didactic instruction of social skills. The study consisted of two separate social skills groups. Two children with Autism Spectrum Disorder (ASD) and two typically developing same-aged peers were included in an experimental group that received video-based social skills instruction. Two other children with ASD and 2 additional typically developing same-aged peers were included in the group that received traditional didactic social skills instruction. The social skills lessons were taught twice per week for 8 weeks. Generalization probes of social interaction during free play time were conducted during analog free time intervals for each child with autism. At the end of the program, effect sizes and PND were calculated to examine differences in the amount of social interaction during free time periods for the two groups, and pre- and postmeasures of social responsiveness were compared.

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## CHAPTER 1

### INTRODUCTION

Autism is a disorder marked by impairment of social interaction and communication. Individuals with Autism and other Autism Spectrum Disorders (ASD) struggle to create and maintain relationships, understand societal cues, take others' perspective, and demonstrate appropriate nonverbal communication skills (American Psychiatric Association, 2000). So great is the impairment in social interaction that it has been identified as the central feature of autism (Carter, Davis, Klin, & Volkmar, 2005). Due to their inability to create and maintain friendships, individuals with Autism often experience increased social rejection, anxiety, and depression (Bellini, Akullian, & Hopf, 2007).

Current research indicates that deficits in social development in children with ASD are apparent from the early months of life (Sigman, Dijamco, Gratier, & Rozga, 2004). From these early months, abnormal social interactions can be observed—such as aversion of gaze, and failure to respond to vocal cues. Before 48 months, children with ASD demonstrated abnormal social play and impaired imitation skills. Children also demonstrated a lack of awareness of others, impaired friendships, decreased imaginative play, and nonverbal communication skills (Stone, Hoffman, Lewis, & Ousley, 1994).

As children with ASD reach preschool, social skills deficits impede typical interaction with peers (Bellini et al., 2007). Abnormal social play, restricted interests, and impaired conversational skills limit opportunities to establish social relationships with peers. Children with ASD receive fewer social initiations, respond to fewer initiations, and when interacting, do so for shorter periods (McConnell, 2002). These limited opportunities to interact and establish relationships with peers can restrict the development of intelligence, language, and other related skills essential to normal childhood development (Garrison-Harrell, Kamps, & Kravits, 1997). Essentially, deficits in the ability to interact and communicate with others create a domino-like effect of negative consequences. Often, impairments in interaction and communication abilities early in life lead to social isolation and difficulty functioning in everyday life in adulthood. Due to poor social skills, adults with ASD often experience mental health problems, higher rates of unemployment, poor school achievement, and cognitive deficiencies (Howlin, Mawhood, & Rutter, 2000; Strain & Schwartz, 2001).

Because of the negative outcomes associated with poor social skills, much research has been devoted to the creation and evaluation of social skills interventions for individuals with ASD—as well as other individuals with social skills deficits (e.g., Bellini & Akullian, 2007; Cotugno, 2009). More and more, social skills development is becoming a primary concern of practitioners working with children with disabilities. In order to increase the probability that individuals engage in functional activity, it is essential that effective interventions be developed to increase the use of social skills.

### Evidence-Based Practice

While many therapies and interventions exist for increasing social skills, it is essential that practices be employed based on empirical research. The implementation of evidence-based practices has been emphasized by educational, psychological, and independent associations.

The National Association of School Psychologists (NASP) has supported definitions of evidence-based practice as given by Hoagwood and Johnson (2003) and Cournoyer and Powers (2002). Through stringent use of inclusion criteria and research designs, evidence-based practices are found to produce “predictable, beneficial, and effective results” in empirical studies. NASP has also set forth several guidelines (Kratochwill & Shernoff, 2003) for the development and the integration of evidence-based practices into educational settings. First, there is a need for shared responsibility for developing interventions that are effective. Researchers and practitioners must work together to design and evaluate interventions. Second, it is important that evidence-based practices use manuals and other procedural guidelines to improve and operationalize evidence-based practices. Kratochwill and Shernoff also emphasize the importance of guidelines that allow the practitioner to know how and when to use a specific intervention, in order to ensure effective implementation of the intervention. Additionally, training of practitioners is fundamental in the integration of evidence-based practices to everyday practice. Both professional development opportunities and training in a scientist-practitioner model function to establish a strong relationship between research and practice. Practitioners are then able to provide additional outcome evaluations based on implementation under typical conditions.

The American Psychological Association has also provided guidelines for evidence-based practice (American Psychological Association, 2006; Chambless et al., 1996), similar to medical guidelines for evidence-based practice that encourage improving patient outcomes through informing practicing clinicians of current research. APA has defined evidence-based practice as “the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences” (American Psychological Association, 2006, p. 1). In addition to improving overall patient outcomes, APA defines the goals of evidence-based practice as making mental health care more cost effective, as well as increasing the accountability of practitioners.

APA also defines the types of research designs that best contribute to the development of evidence-based practice. While traditional random controlled trials and meta-analyses provide stringent measures of treatment efficacy, clinical observations, qualitative research, single-subject designs, case studies, and process-outcome studies also contribute to the empirical evaluation of practices. APA also highlights the importance of not assuming interventions not yet evaluated through randomized trials to be ineffective, but stresses the importance of timely empirical evaluation. Overall, APA views evidence-based practice as designed to improve the mental health care of individuals through an environment of respect, communication, and collaboration among those involved in the treatment process. Similarly to NASP, APA views collaboration between researchers, practitioners, and patients as essential to the advancement of research-based treatments.

Division 12 of APA has attempted to sort empirically evaluated practices into categories based on the amount of research demonstrating positive outcomes, using criteria presented by Chambless et al. (1996). For a practice to be identified as well-established, a minimum of two well-conducted group design studies must be conducted by different researchers. As per Division 12's recommendations, practices evaluated through single subject research may also be considered well-established. However, nine well-conducted single-subject studies must demonstrate substantial positive outcomes. Practices may also be determined to be probably efficacious. Two group design studies conducted by the same investigator and demonstrating positive outcomes may be considered probably efficacious. In the case that at least three single-subject studies have found a practice to be efficacious, the practice may be considered probably efficacious. The guidelines provided by Division 12 are useful in that they provide a concrete definition of evidence-based practice against which practices may be measured. The guidelines also provide researchers with clear directions for establishing evidence-based practices through empirical analysis.

Using the definition of evidence-based practice provided by APA and Division 12, O'Donohue and Ferguson (2006) suggest that several weaknesses exist in using APA's criteria for selecting evidence-based practices in daily practice. First, studies determined to be well-established are often chosen due to statistical significance, not clinical significance. Clinical significance refers to a positive clinical outcome, instead of focusing solely on whether changes observed in the dependent variable were due to the introduction of the independent variable. O'Donohue and Ferguson suggest that while some therapies may be statistically significant, they fail to produce meaningful results.



Second, the criteria proposed by APA (2006) and Chambless et al. (1996) evaluate efficacy, the extent to which a treatment is beneficial, while effectiveness, the successful exportation of an efficacious treatment to a community or private practice setting, is more valued in the clinical setting. In other words, the inclusion of a treatment on the EBP list often does not determine if the treatment is generalizable to other settings. Third, participants included in studies on the EBP list often exclude participants with comorbid conditions, such as intellectual disabilities and depression. While this is useful in research, participants in clinical settings often present with more than one condition, rendering the findings on many interventions irrelevant. Lastly, O'Donohue and Ferguson criticize the criteria for bias for group design studies and inferential statistics. Such bias often eliminates studies utilizing single-subject designs, as well as withdrawal and multiple-baseline designs.

While studies evaluating applied behavior analysis (ABA) -based interventions often are excluded from evidence-based practice lists due to the weaknesses of EPB criteria proposed by O'Donohue and Ferguson (2006), several treatments have been determined to be well-established or probably efficacious. However, many of these treatments originate from "first generation behavior analysis" (O'Donohue & Ferguson, 2001), and a lack of current research using ABA principles is apparent when examining evidence-based practice lists using the Chambless et al. (1996) criteria. Because O'Donohue and Ferguson suggest that ABA has drifted from its empirical roots, they suggest that new research focus on "new-school" behavioral principles, such as response deprivation, matching, and behavioral momentum. The authors also suggest that additional research be conducted on ABA treatments for individuals other than those with

developmental disabilities, expanding research to populations that have not been included in ABA treatment evaluations.

Special education groups, such as the Council for Exceptional Children (CEC, Odom, Brantlinger, Gertsen, Horner, Thompson, & Harris 2005) have also contributed to the current emphasis on evidence-based practices. Due to changes in federal law (No Child Left Behind, 2001), teachers are mandated to use scientifically validated practices. While randomized clinical trials are often considered to be the highest standard of research due to their ability to control for threats to validity, they are rarely implemented for education research. While CEC has recommended that quality indicators be created for special education research, they have yet to be identified. Other research synthesis organizations have provided information on evidence-based practices in education, but practices are often limited to those evaluated in randomized clinical trials or rigorous quasi-experimental designs. The CEC Divisions of Early Childhood has adopted a system of literature reviews and focus groups to identify recommended practices, while the CEC Division of Learning Disabilities and the Division of Research rely on literature reviews by an expert in the field.

The Department of Education, through the Institute of Education Sciences (IES), has created its own criteria for determining whether a practice is evidence-based (Institute of Education Sciences, 2003). Interventions found to be effective in well-designed and implemented randomized controlled trials in two or more typical school settings are determined to be backed by “strong” evidence. “Possible” evidence of effectiveness is comprised of randomized controlled trials that fall short of “strong” evidence and comparison-group studies with close matching of participant characteristics. Studies

using pre- and postdesigns, comparison-group studies without close matching of characteristics, and meta-analyses including poorly completed studies do not comprise “probable” evidence of effectiveness. Overall, the IES places heavy emphasis on randomized controlled trials, stating that a properly designed and implemented randomized controlled trial is superior to other research designs. The IES also proposes that pre-, post- and comparison-group studies often produce erroneous results due to either a lack of or an unclear comparison group. Therefore, the IES proposes that the key to evaluation of treatments is through randomized controlled trials, in which the intervention and participants are clearly described. Detailed description of the control group and explanation of how the intervention is supposed to affect outcomes is also important in conducting research on an intervention’s effectiveness. Studies contributing to strong evidence also need to demonstrate that there were no systematic differences between intervention groups. IES also highlights the importance of using outcome measures that are able to accurately assess the true outcomes. Studies with low-attrition rates and those that evaluate long-term outcomes are also important in contributing to strong evidence. Lastly, IES suggests that statistical tests be conducted in order to determine that the effect is not likely to have been produced by chance, with large sample sizes being better able to obtain such findings.

Perhaps most similar to the guidelines set forth by APA Division 12, the American Speech-Language Hearing Association (ASHA) has adopted levels for determining the amount of empirical support a practice has received (American Speech-Language-Hearing Association, 2004). Level I practices are those that have been shown to be effective through meta-analyses, including a minimum of one randomized

experimental design. Level II practices are those validated through controlled studies and quasi-experimental designs. Practices that have only received support through non-experimental designs, such as case studies, are considered Level III practices. Lastly, Level IV practices are comprised of practices supported only by expert committees and clinical experience of respected authorities. As with the standards supplied by Division 12, the ASHA standards provide clear guides for the development of evidence-based practices. Such guidelines can and should be used by researchers to develop and evaluate practices in order to achieve the stated goals of evidence-based practice—improved outcomes.

In terms of evaluating evidence-based practices for specific disorders, the National Autism Center (NAC) has divided autism-specific treatments into three categories based on evidence of effectiveness (National Autism Center, 2009). For a treatment to be considered Established, the practice has to have produced beneficial effects for those involved in published research studies, and that access to an Established Treatment is expected to produce long-term positive outcomes. Established Treatments are also defined as producing no harmful effects. The NAC notes that, while a treatment may be considered Established, it should not be assumed that one particular treatment would produce universal results for all individuals exposed to the treatment. Instead, it may be necessary to implement several different interventions to determine which is best suited for the individual.

Treatments may also be classified as Unestablished, which suggests that a treatment has no research support or that current research does not allow for conclusions about efficacy. Unestablished Treatments may have been shown to produce no positive

results, or simply lack enough research to determine if the treatment is effective, ineffective, or harmful. Unlike Division 12 of APA, NAC suggests that treatments and practices that lack substantial empirical evaluation only be considered after additional research has been conducted. Treatments and practices that have only limited empirical support have been classified by NAC as Emerging Treatments. NAC suggests that these treatments only be considered for use when Established Treatments have been deemed inappropriate by an informed decision-making team. The NAC has also added to statements from other organizations, factoring not only research findings for a particular intervention, but other critical factors as well. The NAC has identified professional judgment, values and preferences, and treatment provider capacity as playing a central role in the selection and use of evidence-based practices. These other critical factors are useful when making treatment decisions, especially when selecting a treatment that may qualify as Emerging due to limited empirical support.

#### Meta-Analyses

Often, single studies are not capable of detecting differences in effects of two treatments (Egger & Smith, 1997). It is possible, due to low power, that a study may produce no significant effects when such an effect does exist. Large samples that provide adequate statistical power are often difficult to acquire. For example, Collins et al. (1992) suggest that a drug designed to reduce risk of disease by 10% would require 10,000 subjects in each treatment group to be able to detect an effect with 80% accuracy. Such large-scale studies are simply not possible for the majority of research.

Glass (1976) defined meta-analysis as a “statistical analysis of a large collection of analysis results from individual studies for the purpose of integrating the findings” (p. 3). Meta-analyses allow for several small, similar studies to be examined jointly, increasing the ability to detect statistical differences between treatment groups. Meta-analyses have additional advantages over traditional research (Davis & Crombie, 2001). First, meta-analyses allow for determining if, on average, an intervention produces significant benefits for participants. Second, meta-analyses have the ability to overcome bias of authors and reviewers, producing a more objective assessment of evidence than through traditional synthesis. Meta-analyses also offer more exact estimates of the benefits produced by a particular intervention. Due to higher statistical power, meta-analyses are capable of speeding the transition between research and practice often slowed due to false negative results. Lastly, meta-analytic research allows readers to determine the utility of decisions made during the analysis, and how said decisions have influenced final effect sizes produced.

Additionally, meta-analyses have the added benefit of evaluating a priori hypotheses for patient subgroups, as well as generating future research questions (Egger & Smith, 1997). According to Blimling (1988), meta-analyses serve four general purposes: to describe existing studies of a treatment; to determine overall effectiveness of the treatment; to determine influences in the outcome of the treatment; and to quantify the outcome in terms of magnitude and significance.

Several standard steps exist for conducting a meta-analysis (Vegas, 2005). First, a question is defined and relevant studies are collected. Once the studies are selected for inclusion in the meta-analysis, a common metric is transformed from the outcomes of

each study. Last, an average is described from the outcome of the meta-analysis. Methodological soundness of studies is perhaps the most important criteria for meta-analyses, as poorly conducted studies will provide poor statistical results.

### Meta-Analyses of General Interventions for ASD

Since the middle of the 20<sup>th</sup> century, meta-analytical techniques have been employed to evaluate psychological studies. Meta-analytic studies have also evaluated the utility of various ASD treatments. A recent meta-analysis (Eldevik, Hastings, Hughes, Jahr, Eikeseth, & Cross, 2009) evaluated the utility of Early Intensive Behavioral Intervention (EIBI) for the treatment of ASD. Beginning with Lovaas (1987), behavioral interventions have been found to be effective in improving deficits associated with autism. EIBI has been found to be more effective than no intervention controls and other autism-specific special education interventions (Eikeseth, 2009), and Rogers and Vismara (2008) proposed that no other autism intervention presently qualifies as “well-established.”

Nine studies were included in the Eldevik et al. (2009) meta-analysis, with a total of 153 participants in EIBI groups. For participants in EIBI groups, an effect size of 1.103 was found for changes in IQ scores. Eldevik et al. were able to expand upon previous meta-analyses that determined EIBI produced smaller, but still substantial, effects (Reichow & Wolery, 2009) by inclusion of additional studies and through comparison between treatment groups—as opposed to within-subject comparison only. Additionally, Eldevik et al. examined EIBI effects of adaptive behaviors. This analysis provides additional information about the effect of EIBI on participants’ daily life. The

meta-analysis found that EIBI produced an effect size of .660 for adaptive behaviors, a moderate effect size.

An additional meta-analysis analyzed the effect of early intervention for children with autism, evaluating the effects of the intervention on cognitive, language, and adaptive skills. Spreckley and Boyd (2009) evaluated the utility of Applied Behavioral Intervention (ABI) in increasing cognitive, language, and adaptive behavior skills in preschool-age children with autism. Of the studies found in their literature review, only four studies were included in the meta-analysis. Of the four studies included, it was found that ABI produced an effect size of .38 for cognitive skills, or a moderate effect size. Similarly, ABI was found to produce an effect size of .37 for language skills. Lastly, adaptive skills were found to show the least improvement, with an effect size of .30. Due to the small number of studies included in their analysis, it is expected that a larger meta-analysis would be more representative of results produced through early behavioral interventions.

Hourmanesh (2006) conducted a similar meta-analysis, but included a greater number of studies—thereby increasing the power of findings. A total of 16 early comprehensive interventions studies were included in the analysis. Similar to the Reichow and Wolery (2009) meta-analysis, an effect size of .64 was found in the 17 studies that evaluated cognitive skills. Analysis of 10 studies that included language skills as a dependent variable revealed that early comprehensive intervention produced an effect size of .61. The meta-analysis also found that, from the eight studies that evaluated adaptive skills as a dependent variable, an effect size of .68 was found. Overall, this



meta-analysis suggests that EIBI is effective in improving cognitive, language, and adaptive skills in children with ASD, with all effect sizes being in the moderate range.

Similar to Hourmanesh (2006), Backner (2009) evaluated the efficacy of early behaviorally based intervention programs for children with autism. Nine articles were added to the 16 articles in the meta-analysis conducted by Hourmanesh. Overall, it was found that early behaviorally based interventions produced an effect size of .64 for cognitive skills and .28 for adaptive skills, with the adaptive skills effect size being substantially smaller than found by Hourmanesh. Early intervention was found to have a language effect size of .80, the only effect size found to be larger than those from the Hourmanesh meta-analysis. From this meta-analysis, it can be concluded that early behaviorally based intervention is effective in improving cognitive skills. Equally important is the finding that early behaviorally based interventions are effective in improving language skills, as language delays are common for individuals with ASD.

#### Meta-Analysis of Language Interventions for ASD

Because roughly half of individuals with autism will not develop sufficient language skills to meet their needs (Light, Roberts, DiMarco, & Greiner, 1998), meta-analyses have frequently evaluated the impact of interventions on language and communication skills. While early behavioral interventions have been found to have moderate to large effects on language skills, additional language interventions have been investigated via meta-analysis. Augmentative and alternative communication strategies have been explored in addition to EIBI for facilitating communication. Interventions using speech-generating devices, symbols and pictures—such as the Picture Exchange

Communication System, and sign language and gestural acquisition were evaluated in a meta-analysis (Wendt, 2006). For this study, percentage of nonoverlapping data points (PND) was calculated for each intervention technique. Overall, it was found that highly iconic graphic symbols, such as those found in PECS, were associated with better outcomes—producing PND determined to be highly effective. Sign language communication strategies were also associated with improved receptive and expressive communication abilities, with a PND of 78%--or fairly effective. Graphic symbols and sign language were found to be equally effective in increasing functional requesting skills in individuals with ASD.

#### Meta-Analysis of Social Skills Interventions for ASD

Bellini, Peters, Brenner, and Hopf's (2007) meta-analysis of social skill interventions investigated the effects that school-based social skills programs have on individuals with ASD. The meta-analysis included 147 students with ASD who received various forms of social skills instruction in a school setting. The meta-analysis targeted acquisitions of skills such as group play, social initiations, and responding behaviors. The meta-analysis found that the social skills interventions included in the study produced questionable intervention effects due to the fact the skills did not generalize to other settings. Bellini, Peters, Brenner, and Hopf found that most programs produced only moderate maintenance effects and low generalization effects. It was also found that social skills programs show decreased efficacy when the social skills instruction is removed from the setting in which social interaction typically occurs. While traditional social skill instruction was shown to be relatively ineffective as a treatment for aiding in

the acquisition of social skills for individuals with ASD, other forms of treatment, such as video modeling, have been successful in fostering acquisition and generalization of social behaviors.

Bellini and Akullian (2007) conducted a meta-analysis of video modeling and video self-modeling interventions for children with ASD. Interventions included in the study consisted of watching a video of another individual or the participant successfully demonstrating the social skill to be acquired. In their meta-analysis, a total of 23 studies with a total of 73 evaluating the interventions were included. Overall, a PND of 80% was observed across all studies included, or a moderate intervention effect. PND was also calculated across three dependent variables: social-communication skills, functional skills, and behavioral functioning. Video-modeling and video self-modeling interventions produced the greatest effects in functional skills—such as self-help and purchasing skills. PNDs of 77% and 76% were observed in social-communication functioning and behavioral functioning, respectively. Unlike other social skill programs for children with ASD, video modeling and video self-modeling were found to have moderate maintenance effects (PND=83%) and generalization effects (PND=74%). Overall results suggest that video modeling and video self-modeling interventions are effective for improving social and functional skills in children with ASD.

The utility of peers in the social skills training process for children with ASD has also been evaluated through meta-analysis. Zhang (2008) examined peer-mediated interventions for children with ASD under 8 years of age. Forty-five single-subject studies were included in the meta-analysis, which examined changes during intervention phases, as well as follow-up and skill generalization into additional settings. Overall, it

was found that peer-mediated interventions for children with ASD were effective during intervention, producing an effect size of 1.46. Results for follow-up and generalization showed equally promising results for peer-mediated interventions, producing effect sizes of 1.49 and 1.51, respectively. It was also found that peer modeling was the most effective type of peer-mediated training, producing an effect size of 3.16. The majority of individuals included in the meta-analysis received some combination of peer modeling, peer initiation training, peer monitoring, peer networking, peer tutoring, and group-oriented contingencies, which was determined to have an effect size of 1.89.

Peer-mediated interventions were also evaluated in Miller's (2006) meta-analysis of interventions for social interactions in children with ASD. A total of 30 studies were included in the meta-analysis, which evaluated collateral skill, child-specific, and peer-mediated interventions. Collateral skill interventions attempt to increase social interaction by training other skills that assist in social interactions, such as play and academic behaviors. Child-specific interventions are defined as interventions that directly teach and reinforce social behaviors of individuals with ASD. The findings of the meta-analysis revealed large effect sizes for all intervention types. Collateral skill and child-specific interventions produced effect sizes of 2.37 and 2.19, respectively. The effect size for peer-mediated interventions was 3.27. As with results of Zhang's (2008) meta-analysis, peer-mediated interventions were found to produce large effects for individuals with ASD. Miller also found that, as participants' age increased, effect sizes decreased for collateral skill interventions. For peer-mediated interventions, effect size increased for participants receiving peer-mediated interventions. These results suggest

that while collateral skill interventions are useful for young children, school age children with ASD may benefit more from peer-mediated interventions.

The utility of self-management techniques for children with ASD has also been evaluated through meta-analysis (Lee, Simpson, & Shogren, 2007). A total of 11 articles were included in the meta-analysis, with 34 total participants. Studies included evaluated self-monitoring, self-assessment, self-observation, self-recording, self-evaluation, self-instruction, and self-reinforcement. An overall PND of 81.9% was found for interventions using self-management strategies, which represents an effective treatment. Results of the study suggest that self-management is an effective treatment option for individuals with ASD. It was also found that interventions that incorporated monitoring by coparticipants produced greater effects.

Meta-analytic research has provided much information about what steps can be taken to improve treatment efficacy for individuals with ASD. Overall, behavioral interventions—especially those that are early and intensive—have been found to be useful in improving cognitive, adaptive, and language skills of individuals with ASD. Additionally, techniques providing children with additional communication skills have been effective in increasing receptive and expressive language skills. While social skill interventions have been found to produce little effect, other strategies have been effective in increasing social interactions of children with ASD. Through meta-analyses, video modeling, peer-mediated instruction, and self-management strategies have all been found to produce large improvements in social interaction skills of children with ASD. Therefore, it is expected that the inclusion of these components in a social skills program would produce greater results than currently existing social skills curricula.

### Current Social Skills Programs

Much research has been conducted on the efficacy of social skills instruction (Lane, 1999; Mathur & Rutherford, 1991; Quinn, Kavale, Mathur, Rutherford, & Forness, 1999). In general, social skills instruction has been found to be of little use in producing behaviors that generalize across settings. In the Quinn et al. (1999) meta-analysis, social skills programs for children with Emotional and Behavioral Disorders were found to have an effect size of .199. According to Cohen (1988), an effect size of .199 falls in the small effect size category. In other words, social skills curricula were found to produce little to no effect. It is also important to note that, in addition to pro-social behaviors, problem behaviors showed little improvement after social skills training. An overall effect size for measures of disruptive behavior was found to be .131, suggesting social skills training is ineffective for changing behaviors more resistant to change—such as disruptive behaviors. In another meta-analysis of 49 studies evaluating social competence training (Beelmann, Pfingsten, & Losel, 1994) in 3- to 15-year-olds, social skills training was found to have a slightly higher effect size for children with Externalizing Disorders, .48. Again using Cohen's standards, this effect would be classified as a moderate effect. While moderate effects were found for improvement in social skills for children with Externalizing Disorders, no long-term improvements were observed. Follow-up studies included in this meta-analysis demonstrated declining effectiveness over time, with no permanent improvement.

Cook, Gresham, Kern, Barreras, Thornton, and Crews (2008) also completed a meta-analysis on social skills training for students with emotional and behavioral disorders. Seventy-seven studies were included in their meta-analysis. Overall, it was

found that social skills training produced an effect size of .32, or a medium effect according to Cohen's metric. This effect size suggests that social skills training would produce noticeable differences in participant's social competency. It was also found that social skills instruction was most effective for preschool-age children and adolescents, with elementary-age children being less responsive to social skills training. While medium effect sizes were found through this meta-analysis, the authors note that the studies failed to evaluate social skill implementation in real-world settings. Therefore, it is suggested that greater emphasis be placed on the evaluation of social skills training in the school setting in order to better evaluate its effectiveness.

Other meta-analyses have analyzed the utility of social skills programs for children with learning disabilities. Similar to individuals with ASD, individuals with learning disabilities have difficulties establishing relationships with peers (Swanson & Malone, 1992). In their meta-analysis, Swanson and Malone found that children with learning disabilities were found to be less liked and more often rejected than their typical peers. However, existing social skills programs have demonstrated little utility in remediating social skill deficits in children with learning disabilities. In a meta-analysis of 53 studies (Forness & Kavale, 1996), social skills programs for children with learning disabilities were found to have an effect size of .211, or a small effect size. While the children rated themselves as improving substantially, peer and teacher observations of social skills did not.

Although social skills interventions have not shown very promising results for individuals with emotional and behavioral disorders, and learning disabilities, Quinn et al. (1999) did find that social skills interventions produced larger effect sizes for

individuals with anxiety. Although the observed effect size of .422 suggests a moderate effect, it is important to note that only eight of the studies included in Quinn's meta-analysis evaluated anxiety. Additional studies conducted after Quinn's meta-analysis have also evaluated the efficacy of social skills training as a treatment for anxiety. Spence, Donovan, and Brechman-Toussaint (2000) evaluated the efficacy of cognitive-behavioral therapy and social skills training as a treatment for school-based anxiety. The combination of therapies was found to be effective in decreasing school anxiety, with reductions in anxiety being maintained at a 12-month follow-up. Overall, social skills training appears to be beneficial to individuals with anxiety.

Social skills training has also been investigated as a potential treatment for depression. Social skills have long been evaluated as treatment of depression due to the ability of positive social skills to enhance the ability of the individual to receive positive reinforcement, thereby decreasing depression (Lewinsohn & Clark, 1984). Bellack, Hersen, and Himmelhoch (1981) compared the efficacy of social skills training to pharmacotherapy and psychotherapy as treatment for depression. The 72 participants in the study were randomly assigned to one of four groups: pharmacotherapy, social skills play pharmacotherapy, social skills plus placebo, and psychotherapy plus placebo. Overall, it was found that patients in the social skills plus placebo group outperformed participants in all other treatment groups. The authors of the study state that, overall, social skills training may be a more useful intervention for treatment of depression than pharmacotherapy. Participants in the social skills plus placebo group were also found to have the lowest attrition rate of all groups in the study.



In addition to being compared to pharmacotherapy, social skills training has also been compared to support groups for treatment of depression (Fine, Forth, Gilbert, & Haley, 1991). Of 66 adolescents randomly assigned to either a social skills training group or a support group, those in the support group showed greater initial decreases in depressive symptoms. At a 9-month follow-up, these differences were no longer evident. Overall, the study found social skills training and the support group to be equally effective in reducing depressive symptoms over time.

This finding suggests that while social skills programs are not effective in increasing maintenance and generalization of skills taught in all populations, some populations do benefit from social skills interventions. Although externalizing disorders appear to be more resistant to change through social skills instruction, individuals with internalizing disorders such as anxiety and depression appear to receive more benefit from social skills training. Even though social skills training has produced improvements in skill demonstration in these populations, gains have been found to be only moderate.

The majority of social skills programs currently available include several similar features. McConnell (2002) proposed that social skills programs could be divided into five categories. *Environmental modification* strategies attempt to modify environmental characteristics in order to facilitate social interactions between program participants and peers. *Collateral skills interventions* aim to teach skills that facilitate social interactions instead of teaching actual social skills. Skills commonly taught in these interventions include play behaviors and social language. *Peer-mediated interventions* entail the training of typically developing peers to respond to and encourage social interactions of individuals in the social skills group. *Child-specific interventions*, perhaps the most

commonly used variety of social skills instruction, involves directly teaching the participant how to execute the target skill. Skills commonly taught in social skill programs of this variety include appropriate responding and appropriate question asking skills. Lastly, *comprehensive interventions* combine two or more of the previously discussed social skill intervention types.

Several other commonalities exist in social skills programs. Skills deemed by the program designer to be most important for the target population are selected for inclusion in the program, and these skills are subsequently taught. Depending on the social skills program, skills may be demonstrated, explained, or modeled. Typically, social skills programs employ a didactic model of instruction in which an adult facilitator verbally instructs program participants. Although social skills programs are often delivered in the participant's natural environment (i.e., a classroom), instruction frequently occurs in pullout social skills groups (i.e., school counselor's office). Although frequently used in both clinical and school settings, pullout groups have been criticized as being "contrived, restricted and decontextualized" (Gresham, Sugai & Horner, 2001). Gresham et al. also concluded that the average social skill program consists of 30 hours of instruction spread across 10-12 weeks.

Overall, social skills programs have struggled with a lack of research supporting their efficacy. While some disorders have been shown to benefit from inclusion in social skills training—such as anxiety and depression, others have not. While some social skills programs have adopted what has been learned through research, social skills programs continue to be developed and implemented without any empirical basis.

### Social Skills Programs for Autism Spectrum Disorders

Due to Autism Spectrum Disorder's central impairment of social interaction, social skills programs for individuals with ASD have been widely developed (see Table 1). The majority of social skills programs currently available employ a traditional didactic method of instruction in which an adult clinician orally presents the steps to successfully demonstrate various social skills to the individuals with ASD. While each individual program varies with its design and content, most social skills programs adhere to this traditional model of instruction. While the different social skills programs currently available for individuals with ASD have all attempted to increase performance and generalization of social skills, meta-analysis results (Bellini, 2007) have shown that traditional social skills programs are relatively ineffective.

While meta-analyses have suggested that most social skills programs generally produce little to no effects, especially for individuals with ASD, several interventions have demonstrated utility in increasing social interaction of individuals with ASD.

### Video Modeling Interventions

Video modeling and video self-modeling have shown promise as a social skills intervention for individuals with ASD. Video modeling is the process of watching a video of someone demonstrating a discrete behavior or skill to be acquired without error, whereas video self-modeling is the process of watching oneself demonstrate a behavior or skill without error. Repeated viewings of videos of others and video self-modeled skills have proven effective in increasing social skills and having these skills generalize to other environments. Bellini and Akullian (2007) found that video self-modeling was

Table 1

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 Social Skills Programs for Youth with ASD
 

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Social Skills Training for Children and Adolescents with Asperger Syndrome and Social-Communication Problems (Baker & Myles, 2003)

Social Skills Solutions: A Hands-on Manual for Teaching Social Skills to Children with Autism

Navigating the Social World: A Curriculum for Individuals with Asperger's Syndrome, High Functioning Autism, and Related Disorders (McKinnon & Krempa, 2005)

Building Social Relationships: A Systematic Approach to Teaching Social Interaction Skills to Children and Adolescents with Autism Spectrum Disorders and Other Social Difficulties (Bellini, 2006)

S.O.S. Social Skills in Our Schools: A Social Skills Program for Children with Pervasive Developmental Disorders, Including High-Functioning Autism and Asperger Syndrome and Their Typical Peers (Dunn, 2005)

Think Social: A Social Thinking Curriculum for School-aged Students (Winner, 2006)

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effective in increasing the rate of social engagement of 2 preschool-aged children with ASD. More importantly, treatment effects were maintained over time. In a separate study, Nikopoulos (2007) found that the use of 35-second video models of typically developing peers produced significant gains in time spent in social play using toys, resulting in increased interaction time with researchers and peers by children with autism. Nikopoulos also found that video models resulted in generalization of play skills to new toys, settings, and teachers—generalization that was maintained after 1- and 3- month follow-up probes. Video self-modeling has also been found to increase spontaneous requesting of children with ASD (Wert & Neisworth, 2003). Video self-modeling has rapidly become one of the most promising treatments for individuals with ASD.

Although the efficacy of video self-modeling has been demonstrated in a number of studies, other studies comparing video self-modeling to video modeling have found no differences in treatment outcome (Sherer, Pierce, Paredes, Kisacky, Ingersoll, & Shreibman, 2001). Interestingly, Sherer et al. found that individuals who showed improvement using video modeling treatments, regardless of the format of watching others or oneself, also demonstrated higher visual learning skills than those who did not show improvements. This finding is especially important for the treatment of individuals with ASD since research has suggested that individuals with ASD are visual learners (Pierce & Schreibman, 1994). In addition to the Sherer et al. (2001) study, Bellini and Akullian (2007) conducted a meta-analysis of 23 studies, and this showed a similar result.

Bellini and Akullian (2007) found little difference in the efficacy of video modeling and video self-modeling, with both forms of intervention producing moderate to high effect sizes in functional skills, social-communication functioning, and behavioral

functioning. Bellini and Akullian also found video modeling and video self-modeling interventions to have moderate to high maintenance and generalization effects.

### Peer-Mediated Interventions

In addition to video-modeling, peer-mediated interventions have been shown to be effective in social skills training for children with ASD (Miller, 2006). Miller's meta-analysis, which included 30 studies on social skills interventions for children with ASD, found that very young children with ASD benefit most from programs emphasizing the acquisition of collateral skills, such as language. As children with ASD grow older, peer-mediated interventions become the most effective in promoting demonstration of social interaction. This is especially important because relatively few social skills programs currently exist that incorporate peers into the teaching process.

### Self-Management Interventions

Self-management, the process of monitoring and recording ones' own behavior, has also been examined as a technique to increase the use of social skills in individuals with ASD. Self-monitoring attempts to increase social skills by increasing awareness of behavior, managing behavior, and empowering individuals to control their own behavior (Lee et al., 2007). Meta-analysis of single-subject research on self-management revealed that self-management interventions are effective in increasing the rate of appropriate behavior in individuals with ASD.

## Social Stories

In addition to interventions previously mentioned, social stories have been evaluated as a technique for increasing social communication difficulties of individuals with ASD. Social stories allow individuals with ASD to easily access social information that provides clear, order-based definitions of the desired behaviors. Social stories provide participants with information in a visual format, playing on strengths of individuals with ASD. Social stories targeting social communication skills, from basic skills such as maintaining eye contact to more the more complex perspective taking, have shown promise in increasing the display of said skills. Quirnbach, Lincoln, Feinberg-Gizzo, Ingersoll and Andrews (2009) evaluated the use of social stories for increasing play skills, finding social stories to produce significant changes in play behaviors as compared to a control group. Quirnbach et al. also found that basic verbal comprehension skills (ex., WISC VCI above 68) are prerequisite for producing behavioral change due to social stories interventions. Most importantly, social stories hold promise as an efficient, cost-effective intervention that can be designed to encourage generalization and maintenance of learned social skills. However, it has been found that, when utilized as the only intervention component, social stories are not effective in producing long-term changes in social skill demonstration (Sansoti, Powell-Smith, & Kinkaid, 2004; Crozier & Tincani, 2007).

Deficits in social skills have also been associated with special problems for children with ASD. Bullying has been found to be a consistent problem for children with ASD. Little (2001, 2002), found that adolescents with Asperger's Disorder are bullied four times more than a sample of typically developing peers, with approximately 75% of

individuals with ASD being victimized. This high rate of bullying can be attributed to impaired social interaction and communication abilities. Van Roekel, Scholte, and Didden (2009) found that students with ASD placed in special education or in ASD-specific schools experienced a lower rate of bullying—between 7 and 30%. Analysis of bullying in children with ASD revealed that students with ASD could accurately identify bullying situations, but that misinterpretation of nonbullying situations as bullying increased as experience with bullying increased. It was also found that approximately 26% of adolescents with ASD were classified as bullies. Clearly, bullying is a problem that needs to be addressed in social skills programs for children with ASD.

In a review of recent social skills research for individuals with ASD, Reichow and Volkmar (2009) found empirical support for the use of video-modeling and peer-mediated interventions. It was also found that social skills intervention in the naturalistic environment for young children is supported by current research findings. Using the evidence-based practice (EBP) criteria proposed by Reichow and Volkmar, both social skills groups and video modeling can be classified as EBP. It is these findings, along with meta-analyses conducted by Miller (2006), Sherer et al. (2001), and Bellini et al. (2007) that provide much of the basis for the development of the current study examining the Superhero Social Skills program for children with ASD.

### Superhero Social Skills

Superhero Social Skills is intended for elementary-aged children with high functioning Autism, Asperger's Syndrome, or Pervasive Developmental Disorder-Not Otherwise specified. It has been designed to address the shortcomings of other social



skills programs for children with ASD, including lack of maintenance and generalization. The program employs a number of evidence-based practices in order to increase social skill acquisition, namely video modeling and self-modeling, inclusion of nondisabled peers, and the use of self-management strategies. Superhero Social Skills is comprised of 18 social skills (classified as foundational, intermediate, or advanced skills) presented via DVD by animated superheroes. The superheroes address key deficits in social skills functioning in children with ASD. The superhero characters and comic book style of the program make Superhero Social Skills of high interest to children while incorporating evidence-based practices that have been shown to aid in the acquisition, maintenance, and generalization of social skills. A more complete description and example of Superhero Social Skills can be found in Appendix F.

Superhero Social Skills has been designed to employ components of interventions that meet the criteria of evidence-based practice. The evidence-based practice standards provided by the NAC (2009) categorize several of the components of Superhero Social Skills as Established Treatments. The analysis employed by NAC for determining treatment evidence included the following: research design, which suggested the degree of experimental control; measurement of the dependent variable, or accuracy and reliability of the data; measurement of the independent variable, which expresses the extent of treatment fidelity; participant ascertainment, or correct inclusion and eligibility of the participant; and generalization, which demonstrates the researchers attempt to demonstrate successful spread of effects across settings, time, responses, and stimuli.

As previously discussed, modeling and video modeling have been found to be effective in increasing social interaction in individuals with ASD (Bellini et al., 2007).

Additionally, the NAC has classified modeling as an Established Treatment. In their review of 50 live modeling and video modeling studies, the intervention was found to successfully increase communication, play, personal responsibility, and interpersonal skills. Participation in a modeling intervention was also found to increase higher cognitive functions. Modeling was also found to produce a decrease in problem behaviors and improve sensory and emotional regulation. Effects were found for individuals with ASD between the ages of 3 and 18.

The inclusion of peers in the social skills intervention has also been found to be useful in increasing social engagement in children with Autism (Miller, 2006). Similarly, Peer Training Package interventions were classified as an Established Treatment. Thirty-three studies included in the NAC review found that peer-mediated interventions were effective in increasing communication, interpersonal, and play skills in children with autistic disorder and PDD-NOS. Peer-mediated interventions were also found to produce decreases in restricted, repetitive, nonfunctional patterns of behavior, interests, or activity. Peer-mediated intervention effects were found in children ages 3 to 14.

Self-management strategies have been found to be effective in increasing appropriate behavior for children with ASD in meta-analyses (Lee et al., 2007) and in a review of 21 studies by the NAC. In addition to increasing appropriate behaviors as found by Lee et al., studies included in the NEC National Standards Report found that self-regulation skills were increased through implementation of self-management strategies. Overall problem behaviors were decreased for children with autistic disorder ages 3 through 18. Also found to be an Established Treatment by the NAC, Social Stories are an integral component of the Superhero Social Skills program. Through the

review of 21 studies on story-based intervention packages, children with autistic disorder and Asperger's Syndrome ages 6-14 were found to increase interpersonal and self-regulation skills through story-based interventions.

Superhero Social Skills also emphasizes the importance of teaching social skills in the child's natural setting, such as a classroom. The NAC has classified Naturalistic Teaching Strategies and an Established Treatment. In 32 studies, teaching skills in the natural environment was associated with increased communication, interpersonal, learning readiness, and play skills for children ages 0 to 9. These effects were observed in children with both autistic disorder and PDD-NOS.

Superhero Social Skills also incorporates techniques of Direct Instruction (Adams & Carnine, 2003, Marchand-Martella, Slocum, & Martella, 2004). Direct Instruction is designed to increase the rate of learning while promoting generalization of learned skills. Direct Instruction aims to achieve this by the following: appropriate sequencing of skills, or teaching of prerequisites before the strategy is taught; use of clear instructional formats and expectations; and teaching skills across multiple lessons to promote understanding and use of the skill. Direct Instruction also encourages that students be heavily engaged in instructional activities in which they experience high levels of success, and that assessment of learned skills should be continuous in order to provide feedback about the instructional process. The types of teacher-student interactions are also a focus of the Direct Instruction method. Increasing motivation through high levels of success with the skill, teaching to mastery, error correction, increasing opportunities to respond, and the use of cueing and unison responding are employed to encourage rapid acquisition of new skills. Modeling, guided practice, and independent practice are also central instructional

procedures in the acquirement of new skills in the Direct Instruction model. Research has compared the Direct Instruction model to other instructional strategies for students in special education, with Direct Instruction producing better outcomes (Adams & Engelmann, 1996; Forness, Kavale, Blum, & Lloyd, 1997; White, 1988). Overall, Direct Instruction has been found to produce effect sizes between .84 and .90, or large effect sizes.

Skill sequencing, curriculum that promotes generalization, and continual assessment of learned skills have been incorporated into Superhero Social Skills. Superhero Social Skills also establishes clear response expectations of the participants and reinforces learned skills across multiple lessons. Participants in the Superhero Social Skills program are provided with ample opportunities to use the learned skill in each lesson through engagement with peers and the program facilitator, errors are corrected and skills retaught when necessary, cues are provided, and students are engaged in activities where they may experience a high level of success. As with Direct Instruction, Superhero Social Skills employs modeling, guided practice, and independent practice as primary instructional procedures.

Overall, the Superhero Social Skills program includes many components that meet criteria as evidence-based practice. Additionally, the NAC has determined that these components qualify as Established Treatments for ASD, having proven their utility in many studies. Meta-analyses conducted independent of the NAC National Standards Report have confirmed the usefulness of peer-mediated interventions, video modeling, and self-management in improving skill deficits typically associated with ASD.

Superhero Social Skills also employs instructional procedures found to increase learning rate and generalization of learned skills.

In the National Standards Report, the NAC categorized Social Skills Packages as an Emerging Treatment. Their review of 16 studies found that existing social skills packages were effective in increasing interpersonal skills of children with ASD, but no substantial improvements were found in communication skills, personal responsibility skills, play skills, and self-regulation skills. Likewise, no decreases in undesired behaviors were observed after implementation of a social skills package. Superhero Social Skills differs from other existing social skills program in its utilization of a variety of evidence-based practices. Components of Superhero Social Skills have been repeatedly found to increase play behaviors, improve self-regulation and communication skills, increase personal responsibility, and improve higher cognitive functions in addition to increasing interpersonal skills. The components and instructional strategies of Superhero Social Skills have been thoroughly researched and meet the criteria for evidence-based practice, as well as Established Treatments as per NAC guidelines. While existing social skills programs have shown some promise and are currently categorized as Emerging, Superhero Social Skills incorporates a number of empirically-based practices designed to ameliorate social skill deficits not currently addressed by other social skills programs.

### Summary

In summary, a wide variety of social skills interventions for children with ASD currently exist, though very few have been shown to be successful in fostering the

generalization of social skills. Because of the negative consequences associated with poor social skills, it is important that additional research be conducted on social skill instruction for individuals with ASD. *Superhero Social Skills* has been designed to overcome this problem through the use of evidence-based practices, such as video modeling, self-modeling, and incorporation of nondisabled peers in treatment groups. The present study aimed to evaluate the relative efficacy of *Superhero Social Skills* video-based approach compared to a traditional didactic approach, the most commonly used form of social skills instruction, by comparing effect sizes and percentage of non-overlapping data points obtained from two different groups receiving the two types of social skills instruction.

#### Statement of Purpose

The purpose of the present study was to examine the effects of social skills instruction for children with autism presented through video format, compared to traditional didactic instruction. The efficacy of video-based instruction compared to didactic instruction will be evaluated with preschool and kindergarten students in an Autism classroom. It is hypothesized that video-based instruction using animated characters will increase interest in the social skills lessons while reducing anxiety experienced during sessions, leading to increased social skills demonstration and generalization in comparison to didactic instruction.

### Research Questions

1. What is the effect size and PND of *Superhero Social Skills for Children with Autism* when presented in its video-based format, as measured during a social interaction observation during analog free time?
  - a. An observation system designed by Bellini (2007) was used to evaluate the effect of adult facilitator social skills instruction on social engagement of children with ASD.
2. What is the effect size and PND of *Superhero Social Skills for Children with Autism* when presented in a traditional didactic format, as measured during a social interaction observation during analog free time?
  - a. An observation system designed by Bellini (2007) was used to evaluate the effect of *Superhero Social Skills* on social engagement of children with ASD.
3. Using Cohen's (1988) effect size construct, does traditional didactic instruction or video-based instruction produce a greater effect size?
  - a. Results obtained using the Bellini observation system (2007) for the *Superhero Social Skills* group and the didactic instruction group were compared.
4. Comparing preintervention and postintervention scores, what are the changes in participant's Social Responsiveness Scale scores?
  - a. Social Responsiveness Scale
5. Comparing preintervention and postintervention scores, what are the changes in participant's Autism Social Skills Profile scores, as rated by parents?
6. What is the correlation between number of circles filled in on each participant's power cards and their percentage of social interaction during analog free time?

- a. Power Cards
  - b. Bellini observation system
7. What is the improvement in following group rules, as measured by the number of Scooter Cards and Black Hole cards distributed during each social skills lesson?
  - a. Scooter Cards
  - b. Black Hole cards
8. What is the social validity according to teachers, as measured by the BIRS?
  - a. Behavior Intervention Rating Scale (BIRS)
9. What is the social validity according to parents, as measured by the BIRS?
  - a. Behavior Intervention Rating Scale (BIRS)
10. What is the participant satisfaction of *Superhero Social Skills for Children with Autism*, as measured by the Child Consumer Satisfaction Survey?
  - a. Child Consumer Satisfaction Survey
11. What is the social validity according to parents, as measured by a scale adapted from Bellini's social validity scale (unpublished)?
  - a. Scale adapted from Bellini's social validity scale



## CHAPTER 2

### METHODS

Prior to recruitment of participants, consent to conduct the current study at the Carmen B. Pingree Center for Children with Autism was obtained from the Valley Mental Health Research Committee. The Valley Mental Health Research Committee reviewed the proposed study and the Superhero Social Skills program to determine whether the purpose of the proposed study was congruent with the services Valley Mental Health provides. Consent from Institutional Review Board (IRB) at the University of Utah was also obtained prior to the start of this study. IRB evaluated the design of the study, and ensured that participant's rights are protected during the study.

#### Participants

Participants in this study were recruited from a center specializing in the treatment of children with Autism—the Carmen B. Pingree Center for Children with Autism. Such specialized schools offer programming for children with and without ASD. Eight participants were recruited for inclusion in this study—4 children with ASD and 4 normally developing peers. Recruitment consisted of the following: first, teacher recommendation of appropriate participants; second, notes sent home to parents

describing the study and inviting participation; third, random selection through number assignment of those consenting to participate and lottery drawing to determine participant placement. To qualify for inclusion in the study, participants met the following criteria.

#### Inclusion Criteria for Children with ASD

In order to be included as a participant, children had to meet the following criteria:

1. Have a current diagnosis of Autism, Asperger's Syndrome, or Pervasive Developmental Disorder-Not Otherwise Specified from a qualified clinician (i.e., MD, psychologist).
2. Obtain scores on the Autism Diagnostic Observation Schedule (ADOS) that meet or exceed the cut-off for Autism Spectrum Disorders
3. Obtain a score on the Social Responsiveness Scale (SRS) that meets or exceeds the cut-off for Autism Spectrum Disorders.
4. Obtain an IQ score of 70 or higher on a standardized intelligence test, administered within the past 3 years by a qualified administrator.
5. Possess and demonstrate use of sufficient expressive and receptive language so as to be able to participate in the social skills group.
6. Be currently enrolled in the Pingree Center's preschool or kindergarten program.

In addition to meeting these criteria, a placement checklist (Appendix A) designed for this study to screen participants was administered to teachers and parents to aid in the selection of participants. Placement checklist criteria consisted of the following:

1. Developmental level of child
2. Language abilities of child
3. Parent description of cognitive abilities
4. Current diagnosis of ASD
5. Unusual behaviors that interfere with social interactions
6. Motivational level
7. Attentional abilities
8. Memory abilities
9. Anxiety
10. Other factors deemed important by parent.

Teachers and staff at the Pingree Center were asked to identify students with ASD who meet the inclusion criteria for children with ASD. Because the Pingree Center houses a developmentally appropriate preschool for integration purposes, not all children at the Pingree Center have ASD. Four nonautistic same-aged peers who possess developmentally appropriate social skills were recruited from the Pingree Center to participate in the lessons. Typically developing peers were recruited from an on-site preschool that allows children with ASD to have access to nondisabled peers. Teachers at the school were asked to nominate children in their classes that regularly demonstrate developmentally appropriate social skills without teacher prompting and whose behavior is conducive to small group social skills instruction.

After a list of students with and without ASD who meet inclusion criteria for inclusion was compiled, a letter was sent to each student's parents(s)/guardian(s) in order to obtain consent to participate in the study. Because only 4 children with Autism and 4

developmentally normal peers were included in the study, the letter explained that their child may or may not be a participant. The 4 students with autism and their peers included in the study were randomly selected from those that obtain consent to participate in the study. Of all potential participants who returned consent forms, each was assigned a number. After 2 weeks of allowing return of consent forms, a lottery was conducted in which random numbers were selected from a container. Participants whose assigned number matched the drawn number were selected for inclusion in the study. The 4 participants with ASD were then randomly assigned to one of the two treatment conditions in a similar fashion: video-based instruction and didactic instruction. The typical peers were also randomly assigned to one of the two groups in the same manner. The following are more detailed descriptions of characteristics of participants with ASD.

*Participant 1*, a 4.9-year-old Caucasian female, was assigned to the video-based social skills group. Participant 1 had previously received a clinical diagnosis of autism from the Clinical Medical Director of the Pingree Center. Prior to intervention, an ADOS was administered to confirm a diagnosis of an ASD. Participant 1 obtained a Communication + Social Interaction Total score of 14, exceeding the autism cut-off of 12. Participant 1 was capable of using phrase speech, but was not considered verbally fluent. Previously, Participant 1 had obtained a Full Scale IQ score 101 on the Wechsler Preschool and Primary Scale of Intelligence-Third Edition (WPPSI-III). Participant 1's mother described her as having an abnormal adherence to routine, often becoming upset when placed in new situations or frustrating activities. Participant 1 was also described as having difficulty calming herself when upset.

*Participant 2*, a 4.8-year-old Caucasian male, was also assigned to the video-based social skills group. Participant 2 had previously received a clinical diagnosis of PDD-NOS from the Clinical Medical Director of the Pingree Center. An ADOS was administered to confirm a diagnosis of ASD. Participant 2 obtained a Communication + Social Interaction Total score of 11, exceeding the autism spectrum cut-off of 8. Participant 2 exhibited increased difficulty with the Reciprocal Social Interaction section of the ADOS, receiving a score of 8, exceeding the autism cut-off of 6. Prior to recruitment to participate in the study, a Stanford-Binet 5 was administered. Participant 2 received a Nonverbal IQ score of 128, a Verbal IQ score of 111, and a Full Scale IQ score of 120. Participant 2's mother described him as rigid and inflexible, often engaging in behavior inappropriate for the situation. During the study, Participant 2 continued his normal use of Prozac—1.25 mg/day.

*Participant 3*, a 3.8-year-old Caucasian male, was assigned to the didactic social skills instruction group. Prior to inclusion in the study, Participant 3 had received a clinical and educational diagnosis of Autistic Disorder. The mother of Participant 3 reported that he first received a diagnosis of PDD-NOS at age 15 months. While a community physician originally diagnosed Participant 3 with autism, the diagnosis was also confirmed by the Clinical Medical Director of the Pingree Center. Confirmation of the diagnosis was obtained through administration of an ADOS. Participant 3 received a Communication + Social Interaction Total score of 10, exceeding the autism spectrum cut-off of 8. A WPPSI-III was also administered to determine inclusion criteria. Participant 3 received a Verbal IQ score of 110, a Performance IQ score of 105, and a Full Scale IQ score of 109. Participant 3's mother described several behaviors that

interfered with Participant 3’s social interaction with others: rigidity in play behaviors (i.e., “play my way”), and abnormal play behaviors (i.e., lining objects up and wrapping strings around things). Since Participant 3’s first diagnosis, he has continually received interventions to remediate his difficulties.

*Participant 4*, a 5.2-year-old African American male, was also assigned to the didactic social skills instruction group. Prior to inclusion in the study, Participant 4 had received a clinical and educational classification of Autistic Disorder. While the Clinical Medical Director of the Pingree Center assigned the clinical diagnosis, the origin of the educational diagnosis is unknown. Confirmation of this diagnosis was obtained through administration of an ADOS. Participant 4 received a Communication + Social Interaction Total of 13, exceeding the Autism cut-off. Participant 4 had previously been administered a Stanford-Binet 5, on which he obtained a Full Scale IQ score of 95. Participant 4 was described as having particular difficulty in frustrating activities. Participant 4 was also described as being inflexible and having difficulty focusing. Information on all participants is also presented in Table 2.

Table 2

## Participant Characteristics

	Participant 1	Participant 2	Participant 3	Participant 4	Total
Child’s Age	4.9	4.8	3.8	5.2	4.6
ADOS Total	14	11	10	13	12
FSIQ Score	101	120	109	95	106
GADS Total	78	92	103	82	88.7
Preintervention SRS					
Total Parent	75	69	90	70	76
Teacher	55	56	47	50	52

### Setting

Children were recruited for inclusion in the current study through a school specializing in the treatment of children with autism—The Pingree Center for Children with Autism, but also educates normally developing children as well. The Pingree Center bases treatment of children with ASD on an Applied Behavior Analysis model. Initial assessment, social skills instruction, observation of skills, and follow-up assessment took place at the Pingree Center. Lessons were taught in a kiva type conference room located at the center. The conference room was equipped with a projector, with which videos were shown. Participants sat on carpet squares on the floor of the room. The room was sufficiently large as to play a social skills game as a group after each lesson. Free time observations occurred in the same room as social skills instruction. During free play, carpet squares were removed from the play area. For coding and reliability, free time sessions were videoed. Six toys were available for participant use during free time sessions. Initially, participants had access to toy cars (Mattel), LEGOS (LEGO), Ants in the Pants Spongebob Edition (Hasbro), Transformers (Hasbro), and Don't Break the Ice (Hasbro). After the first baseline session, Don't Break the Ice was replaced with Ring Around the Nosy (Pressman Toy) due to participant difficulty in assembling the game.

### Dependent Measures

#### Observation System

Bellini's Social Observation System (2007, see Appendix B) was used during baseline and treatment phases to evaluate the amount of social interaction demonstrated by participants with ASD. Bellini's Social Observation codes allow for coding of social

initiations, social responses, total social engagement, and play behaviors. Social initiations are defined as the following: requesting assistance or information; joining in a play activity or interaction; giving a greeting or compliment; giving, sharing, or showing an object; and requesting interaction or participation. In order for a behavior to be coded as a social initiation, the behavior must be the beginning of a new behavioral sequence. This may be accomplished through changing play activities, partners, or discontinuing a behavior for at least 5 seconds. Social responses are defined as responding to a request for assistance or information, joining an activity upon request, accepting an object when offered, and appropriately continuing an interaction.

The observation system uses a 10-second time sampling method of observing behaviors, in which the observer watches the behavior for 5 seconds, and then records the behavior during the next 5 seconds. During each interval, only one behavior was coded: a social initiation, a social response, or no behavior. The observational data gained provide the needed information to calculate effect sizes for the video-based and didactic instruction groups. At the end of each session, observations of a 10-minute analog free time period were conducted. Free time periods were videotaped to facilitate coding of social engagement. Analog free time periods were conducted at the end of each lesson, with social engagement codes being calculated for each participant with ASD during all free time periods.

### Social Responsiveness Scale

The Social Responsiveness Scale (SRS; Constantino, 2002) is a 65-item questionnaire that is designed to assess several characteristics of autism spectrum



disorders. The SRS provides an assessment of social impairments, social awareness, social information processing, ability for reciprocal social communication, anxiety and avoidance of social situations, and autistic traits. Items on the SRS are rated from 1-4 (not true to almost always true). The SRS was administered to parents and teachers of participants with ASD prior to intervention implementation. Upon the completion of the social skills program, the Social SRS was again completed for the children with ASD by parents and teachers. Pre- and postintervention scores will be compared to determine any changes in social responsiveness.

#### Autism Social Skills Profile

The Autism Social Skills Profile (Appendix H) is a 49-item likert-type scale designed to assess social engagement abilities of children with ASD (Bellini & Hopf, 2007). Items may be answered 1-never/almost never, 2-sometimes/occasionally, 3-often/typically, or 4-very often/always. The ASSP was designed to aid in the planning of social skills interventions, as well as assess the effect of developed interventions. The ASSP yields a total score, as well as three subscale scores—Social Reciprocity, Social Participation/Avoidance, and Detrimental Social Behaviors. On the ASSP, higher scores suggest less impairment in social functioning. The ASSP was completed by parents of participants with ASD prior to beginning intervention, as well as at the conclusion of intervention.

### Power Cards

The Superhero Social Skills program uses Power Cards (Appendix I) to track the successful demonstration of social skills taught in the program. Power Cards are distributed during the first social skills lesson of a new skill. The Power Cards have a picture of one of the superheroes, along with the steps to the current skill being learned. To track demonstrations of the current skill, the Power Cards are bordered with circles that are filled in when the skill is demonstrated correctly. Each week, the number of circles each student has filled in was recorded. At the end of the program, the number of circles completed each week was correlated with frequency of social engagement as measured by Bellini's Social Observation System during analog free time sessions.

### Scooter and Black Hole Cards

Scooter Cards and Black Hole Cards (Appendix I), built-in components of the Superhero Social Skills program, were used to evaluate change in rule-following behavior over the course of the social skills program. During social skills lessons, Scooter cards were distributed to children based on their following group rules (i.e., Get Ready, Follow Directions, Be Cool, and Participate), while failing to follow group rules earned participants Black Hole cards. The number of Scooter cards and Black Hole cards passed out during each social skills lesson was charted to determine changes in rule following behavior for individuals in the group.

### Behavioral Intervention Rating Scale

The Behavioral Intervention Rating Scale (BIRS; Von Brock & Elliott, 1987) was administered to teachers and parents upon the completion of the intervention. The BIRS is a 24-item Likert-type scale that is effective in assessing treatment efficacy and iatrogenic treatment effects. Responses to items are based on a six point scale ranging from strongly agree to strongly disagree. The BIRS will be used to evaluate teacher and parent judgments as to the efficacy of the Superhero Social Skills program.

### Child Consumer Satisfaction Survey

In order to evaluate participant satisfaction in this study, the Child Consumer Satisfaction Survey (CCSS) was developed (Block, Hood, & Radley, unpublished; see Appendix C). The CCSS is a simple 5-question Likert-type scale that is used to determine acceptability of interventions, as assessed by the participant. These scores will be used to evaluate participant experience of the Superhero Social Skills program.

### Social Validity Checklist

The Social Validity Checklist (Appendix D) adapted from Bellini (unpublished) was completed by parents upon completion of the intervention. The social validity checklist is a 7-question Likert-type scale that is used to assess parental perceptions of the efficacy and worth of the Superhero Social Skills program.

## Intervention Fidelity

To assess the fidelity with which the Superhero Social Skills program was implemented, an intervention fidelity checklist was created (Appendix E). The checklist was created by compiling a detailed, sequential list of the steps of the Superhero Social Skills program. At the conclusion of each social skills lesson, the social skills instructors completed the checklist. A mean percentage of treatment fidelity was then calculated.

## Design

A replicated AB single-subject design was used to compare the efficacy of video-based instruction to traditional didactic instruction (Hayes, 1981). Baseline observations of social interaction during analog free time periods were conducted three times for each participant with ASD. Observations of free time social interaction were conducted during the experimental phase at the conclusion of each social skills lesson. The replicated single-subject AB design involves the establishment of stability during the baseline phase (A), and the introduction of change in conditions affecting the subject (B).

Although several threats to internal validity present themselves when using AB single-subject research design, Kazdin (1982) and Kratochwill (1992) have concluded that AB designs are valid when they meet strict conditions. Kazdin argued that AB designs are valid when:

1. The data are objective
2. Assessments occur on multiple occasions
3. The target behavior being treated is stable
4. When participants form a heterogeneous group and

5. When the intervention produces immediate and marked effects.

Kratochwill added several criteria that a study must meet before it can be considered valid:

1. The study must be planned
2. Maintain a high level of treatment integrity
3. Consist of a standardized treatment and
4. Produce a large effect size.

If the trend observed in phase A suddenly changes with the introduction of phase B, one can be confident that changes in phase B are responsible for changes in behavior (Hayes, 1981). However, results from the AB design can be confounded by factors such as maturation, the effect of measurement, and other external events (Kratochwill, 1978). To control for confounding variables, the multiple baseline design is commonly used in single-subject research. Essentially, the multiple baseline design involves implementation of phase B at different times for each subject by employing staggered baseline phases. This technique allows for control of reaction to assessment and maturation, as well as reducing the probability that external factors are producing the changes in the target behavior (Hayes, 1981). Because the social skills programs evaluated in the current study are designed to be conducted in groups of children, a multiple baseline design could not be used.

This study meets both with Kazdin's and Kratochwill's criteria for valid single-subject research. The problem being treated, ASD, is a stable trait. The participants are heterogeneous in diagnosis, age, inclusionary abilities, and level of education. Assessments of social interaction during analog free time periods are conducted multiple

times during the study, and the treatment consists of highly structured lessons, delivered by trained researchers. Results of this study also suggest that the current study meets the criteria for producing large changes in the target behavior.

### Procedures

Two children with ASD and 2 normally developing peers were randomly selected to be included in a group receiving Superhero Social Skills via video—Participant 1 and Participant 2 were assigned to the video group. After teachers nominated children to participate in the program, parents were contacted through a note sent home in order to obtain consent for their child to participate in the current study (see Parental Consent Form, Appendix E). The purpose of the current study was explained and any questions that parents/guardians may have were answered. After consent was obtained, 4 children with ASD and 4 typically developing peers were randomly selected for inclusion in the study. Each child who returned a consent form was assigned a number, after which numbers were drawn at random to determine the participants in the video-based Superhero Social Skills group. When those participants had been determined, the remaining 2 children with ASD—Participant 3 and Participant 4—and their peers were assigned to the group that received Superhero Social Skills through a traditional didactic instruction format in which the primary researcher and a trained graduate assistant presented each lesson.

### Baseline

After participants had been randomly assigned to treatment groups, the baseline phase of the current study was conducted. During baseline phase, participants were observed in an analog setting for three 10-minute free time sessions to establish a baseline measure of social interaction. Observations were conducted in the same room in which the lessons were taught. During free time observations, six toys/games as previously described were provided for the children. A time-sampling procedure will be used to determine the number of 10-second intervals in which the child with ASD initiates interaction or responds to their peers during the 10-minute interval.

### Superhero Social Skills Program

The program is designed to be taught twice weekly over an 18-week period (see program description in Appendix F). One new social skill is presented each week to each group in the study, with each skill consisting of two lessons. Lessons from the social skills program, *Superhero Social Skills*, are intended to be taught to children with Autism when accompanied by their peers. During the first session of each week, the social skill is presented by animated superheroes—The Initiator and Interactor Girl, and their sidekick Scooter the Robot. The superheroes introduce the skill, provide rationale for use of the skill, and outline steps for correct demonstration of the skill. The superheroes then invite the children with ASD and their peers to watch video models of children demonstrating the skill. After viewing several video models of the skill, the viewers are invited to role-play the skill. The second weekly lesson reviews the acquisition of the skill through a repeated viewing of the entire social skills video and additional role-

playing. At the end of each social skill lesson, participants in the program participate in social games that allow them to practice newly learned skills in an analog setting.

In order to foster generalization, a DVD of the video modeled social skill is provided for the home, using similar lessons to those taught at school or in a clinic. In addition to the use of DVDs to present social skills, Superhero Power Cards are used. Power Cards are used for self-monitoring, and are marked by a facilitator or parent when the child successfully demonstrates the learned social skill. The Power Card is also used as a homework mechanism, allowing empty spaces on the card to be filled in by the parent when the social skill is demonstrated in a generalized setting. Self-monitoring occurs at the end of each social skills lesson, when the participant transfers the marks on the Power Card to a Power Poster, which is displayed in the treatment setting. Each week, participants in the program receive a new Power Card, encouraging the demonstration of the current week's social skill. Social Stories in the form of a comic book are also given as homework. Each week, participants are assigned a new comic book chapter in which the superheroes demonstrate the social skill.

#### Superhero Social Skills Group-Implementation

Social skills lessons were taught two times per week for 45 minutes. During this study, only the Superhero Social Skills eight foundational skills were taught. These lessons included Introduction to the Social Skills Group, Get Ready, Following Directions, Anxiety Reduction, Participating, Generalized Imitation, Body Basics, Expressing Wants and Needs, and Joint Attention (see Appendix F for complete description of the skills). A new lesson was presented at the beginning of each new



week. Occasionally, regular social skills instruction was interrupted by school holidays. In these cases, social skills instruction was presented on the next available day. The social skills lessons follow a set schedule for the group viewing the animated videos and the group receiving only traditional didactic instruction.

#### Didactic Group-Implementation

Those participants assigned to the didactic teaching group received exactly the same content as those in the video-based group, except that the group facilitators, the primary researcher and another School Psychology graduate student at the University of Utah, presented all the information, rationale, and social skills steps. While the didactic teaching group did not view the animated videos, they viewed the peer modeling videos as part of the weekly social skills lessons and homework.

#### Observation of Social Initiation and Responses

Following the social skills lesson, probes of social interactions during the analog free time period were conducted 18 times for each child in the Superhero Social Skills group and the didactic group over the 8 weeks. Probes were conducted in an identical fashion to baseline social interaction probes: each participant with ASD was observed during each free time period of 10 minutes in the analog setting. These periods were filmed, and coding of social initiations and responses were completed at a later time. Social engagement was coded using Bellini's Social Interaction Codes (Appendix B; Bellini, unpublished). Bellini's codes allow for coding of seven different types of social initiation and six types of social responses. While codings were completed using the

specific initiation and response codes, data analysis only considered the more general categories of initiation and response. For a more detailed description of Bellini's codes, see Appendix B. These codes allowed for detailed descriptions of participant's social engagement during the free time periods.

In addition to filming analog play periods and coding for social interactions, the number of Scooter Cards and Black Hole cards distributed during the social skills lesson was recorded at the close of each lesson. This number was recorded and plotted on a graph, allowing for an analysis in change of rule-following behaviors over time. The number of Power Charges earned was also recorded at the end of each lesson. This recording was completed by the participant as they transferred marks from the Power Card to the Power Poster. This recording, which also functioned as a self-monitoring technique for the participant, was verified by the group facilitator.

Upon conclusion of the social skills lessons, participants with ASD in both groups were given the Child Consumer Satisfaction Survey (CCSP). The CCSP items were presented verbally to participants to ensure understanding of each question. Parents of children with ASD and their teachers were given the BIRS and the SRS, while only parents of children with ASD were asked to complete Bellini's social validity checklist. These measures were collected by the primary researcher and scored. Effect sizes and percentage of nonoverlapping data points were also calculated by the primary researcher using data collected through the Bellini Observation System.

### Data Analysis

In order to compare efficacy of the two forms of instruction, effect sizes were calculated for each group. Percentage of observed 10-second intervals in which social initiation and social response occurred were calculated for each participant with ASD for baseline and treatment phases. Using the Busk and Serlin (1992) No Assumptions model, effect sizes were calculated for the video instruction group and the traditional didactic instruction group. Effect sizes were interpreted using the Cohen's (1988) standards for interpreting effect sizes. Cohen defined a small effect size as one between 0.1 and 0.3, a medium effect size as between 0.3 and 0.8, and a large effect size as a correlation of 0.8 and above.

In conjunction with effect sizes, percentage of nonoverlapping data points (PND; Scruggs, Mastropieri, & Casto, 1987) was calculated for social interactions of children with autism during the observed free time probes. PND is computed by determining those intervention data points whose value is higher than the highest baseline data point value. Once these points have been determined, the number of nonoverlapping data points is divided by the total number of intervention data points. When PND has been determined for each subject, PND scores for each participant were averaged to obtain one PND score for each group.

The number of Power Card circles completed by each participant and the percentage of free time spent in social interaction were correlated using a Pearson Correlation Coefficient. Descriptive statistics were used to determine changes in rule-following behavior over time, as measured by Scooter and Black Hole cards. Pre- and posttest scores obtained from SRS were compared. Constantino suggests that changes in

SRS T-scores by one to two standard error of measures should be considered significant treatment effects (Constantino, 2002). This study follows Constantino's more conservative recommendation, assuming scores that change by two or more SEM to be significant changes. Teacher and parent treatment acceptability scores gathered from the BIRS and Bellini's Social Validity Measure, as well as participant ratings of acceptability on the CCSS, were also analyzed using descriptive statistics.

## CHAPTER 3

### RESULTS

The purpose of this study is to pilot test a program developed to teach social skills to preschool-age children with ASD in a specialized setting, and to compare the efficacy of video-based presentation of social skills training to a didactic method of instruction. The program is based on a superhero theme with animation and comic books, and incorporates research-validated components of previously developed social skills programs, including video modeling, social stories, direct instruction, and self-monitoring.

#### Research Question 1

*What is the effect size and PND of Superhero Social Skills for Children with Autism when presented in its video-based format, as measured during a social interaction observation during analog free time?*

Analysis of treatment fidelity checklists revealed that the Superhero Social Skills video-based intervention was delivered with 100% integrity.

Overall, participants in the video-based group initiated social interactions an average of 4.72% of intervals during baseline, and initiated interactions during 4.7% of

treatment intervals. Participants responded to others during 1.35% of intervals during baseline, and 11.95% of intervals during treatment. Participants in the video-based group averaged social engagement during 6.35% of baseline intervals, and averaged social engagement during 16.75% of intervals. Using Cohen's metric to interpret average effect sizes for participants in the video-based group, a small effect size was observed in social initiations ( $ES=.295$ ). Large effect sizes were observed in both social responses ( $ES=1.05$ ) and total engagement ( $ES=.88$ ).

Participant 1, assigned to the Superhero Social Skills video-based instruction group, was present for 15 of 16 social skill lessons. During the 10-minute baseline observations, Participant 1 initiated social initiations an average of 0.05% of intervals. During treatment, Participant 1 averaged social initiations during 1.5% of intervals. Participant 1 responded to others during 1.1% of intervals of baseline, and 4.7% during treatment. Social engagement was observed in an average of 1.6% of intervals during the baseline phase, and an average of 6.3% of intervals during treatment (Figures 1, 2, and 3). Using Cohen's metric for judging effect sizes, large effect sizes were observed in social initiations ( $ES=0.80$ ) and total social engagement ( $ES=0.82$ ), while a medium effect was observed in social responses ( $ES=0.71$ ). Percentage of nonoverlapping data points was calculated at 40%.

Participant 2, assigned to the Superhero Social Skills video-based instruction group, was present for 9 of 16 social skill lessons. Participant 2 was unexpectedly removed from the Pingree Center just after half the social skills lessons had been presented. At the end of the intervention, follow-up forms were sent to Participant 2's parents, but were never returned. While incomplete, the data show progress made before

### Participant 1-Social Initiations

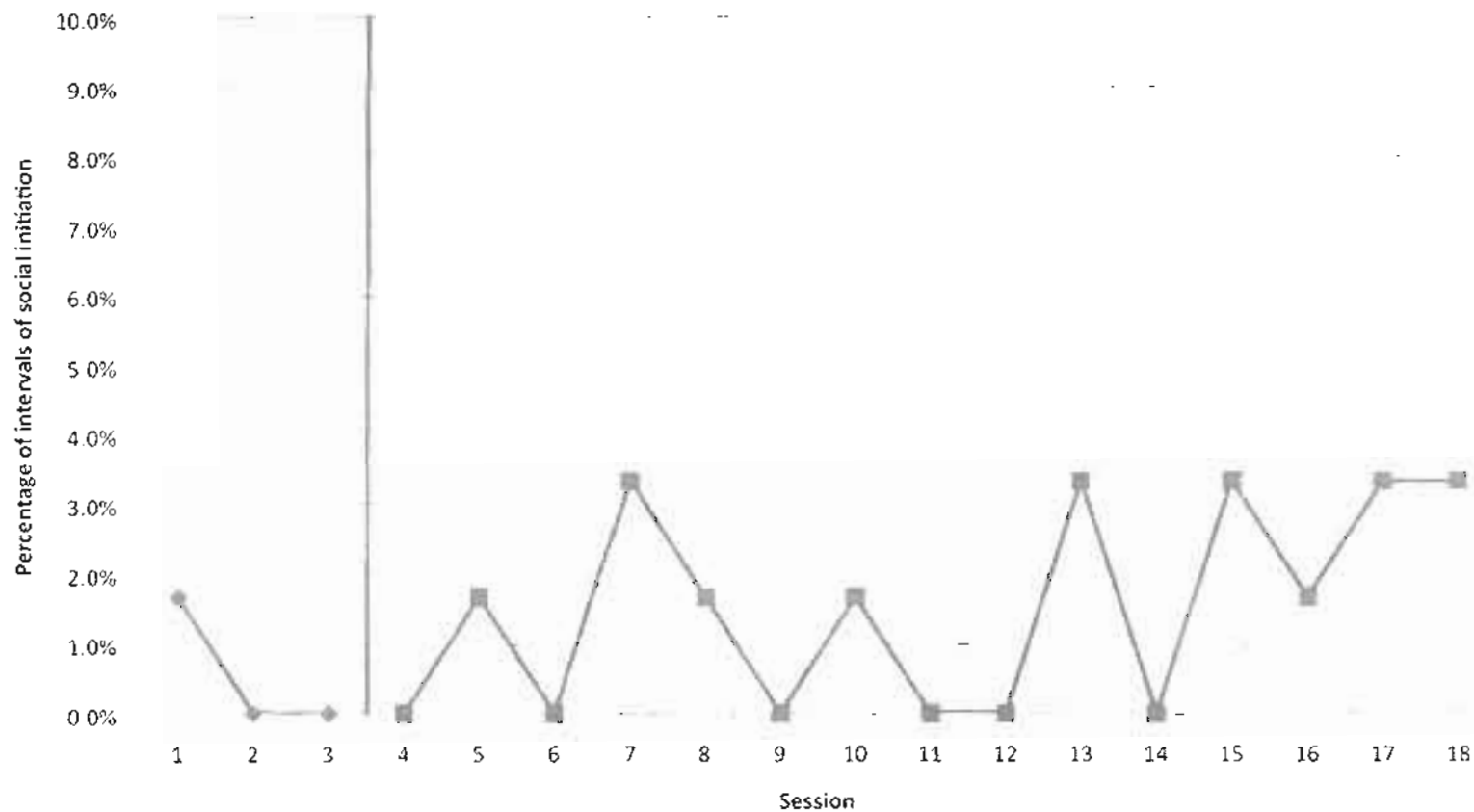


Figure 1. Social Initiations, Participant 1

### Participant 1-Social Responses

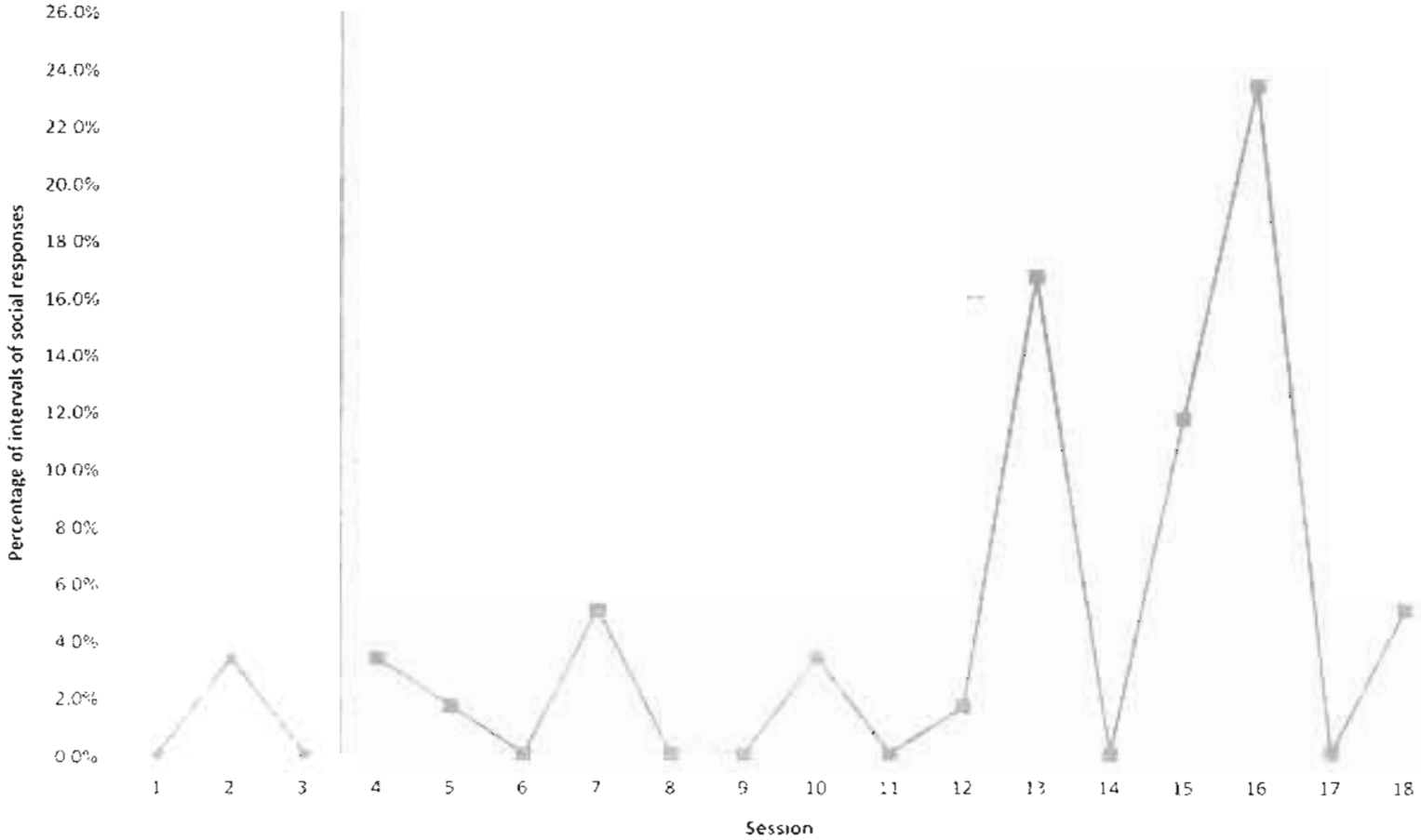


Figure 2. Social Responses, Participant 1



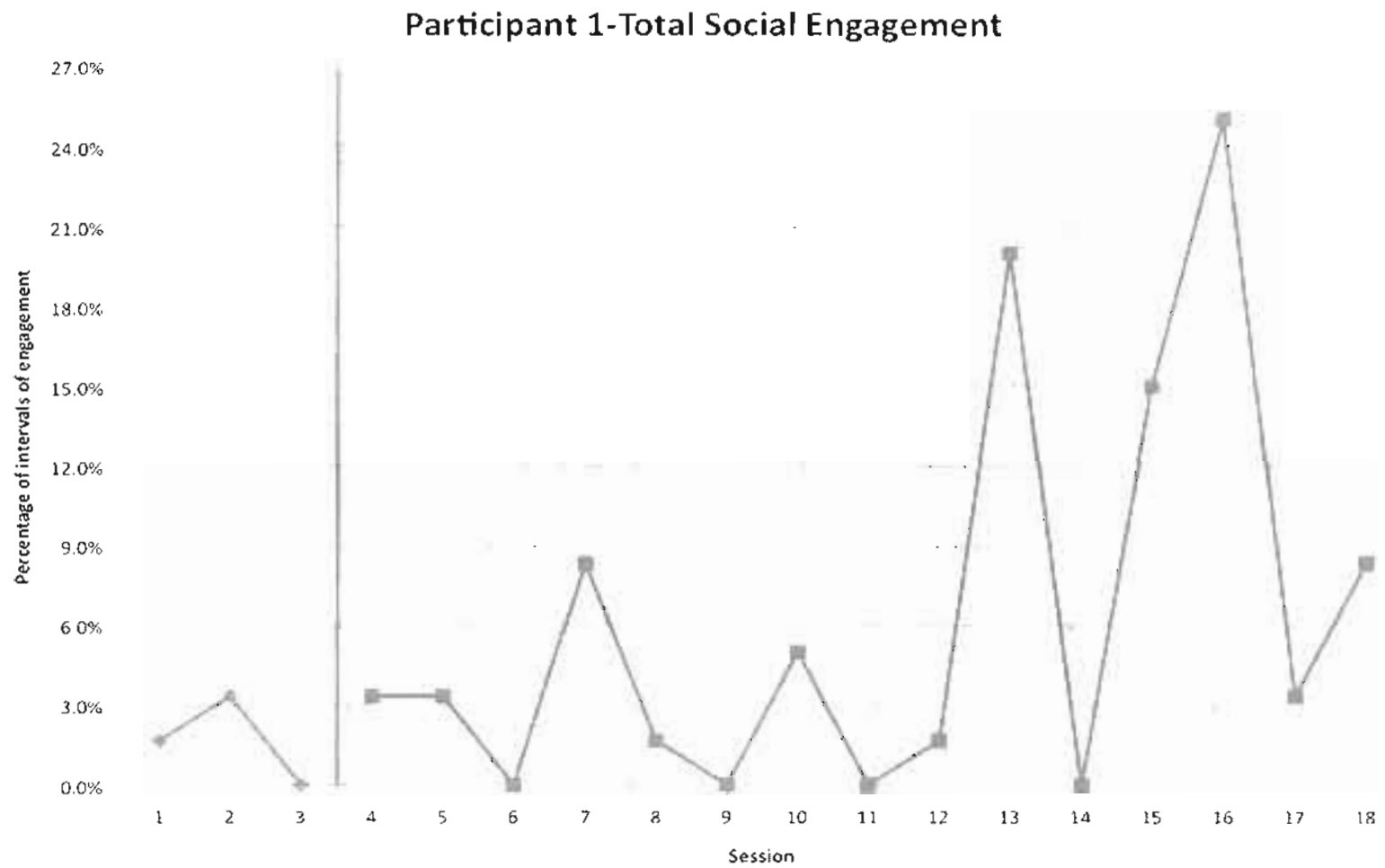


Figure 3. Total Social Engagement, Participant 1

removal from the school. During the 10-minute baseline observations, Participant 2 initiated social interactions an average of 9.4% of intervals. During the treatment phase, Participant 2 averaged social initiations during 7.9% of interactions. Participant 2 responded to others during 1.6% of intervals in the baseline phase, and responded to others an average of 19.2% of intervals during the treatment phase. Social engagement was observed in an average of 11.1% of intervals of baseline, and an average of 27.2% of intervals of treatment (Figures 4, 5, and 6). A small negative effect was observed in social initiation ( $ES=-0.21$ ). Large effect sizes were observed in both social responses ( $ES=1.28$ ) and total social engagement ( $ES=1.05$ ). Percentage of nonoverlapping data points was calculated to be 55.6%.

Overall, data collected suggest that video-based Superhero Social Skills is effective in increasing social responding and total engagement in individuals with ASD. Both participants made gains in social responses and total engagement, while only Participant 1 improved in social initiations. This research question was satisfied with the data collected.

#### Research Question 2

*What is the effect size and PND of Superhero Social Skills for Children with Autism when presented in a traditional didactic format, as measured during a social interaction observation during analog free time?*

Fidelity checklists from the didactic instruction group revealed that the didactic Superhero Social Skills group was delivered with 100% treatment integrity.

### Participant 2-Social Initiations

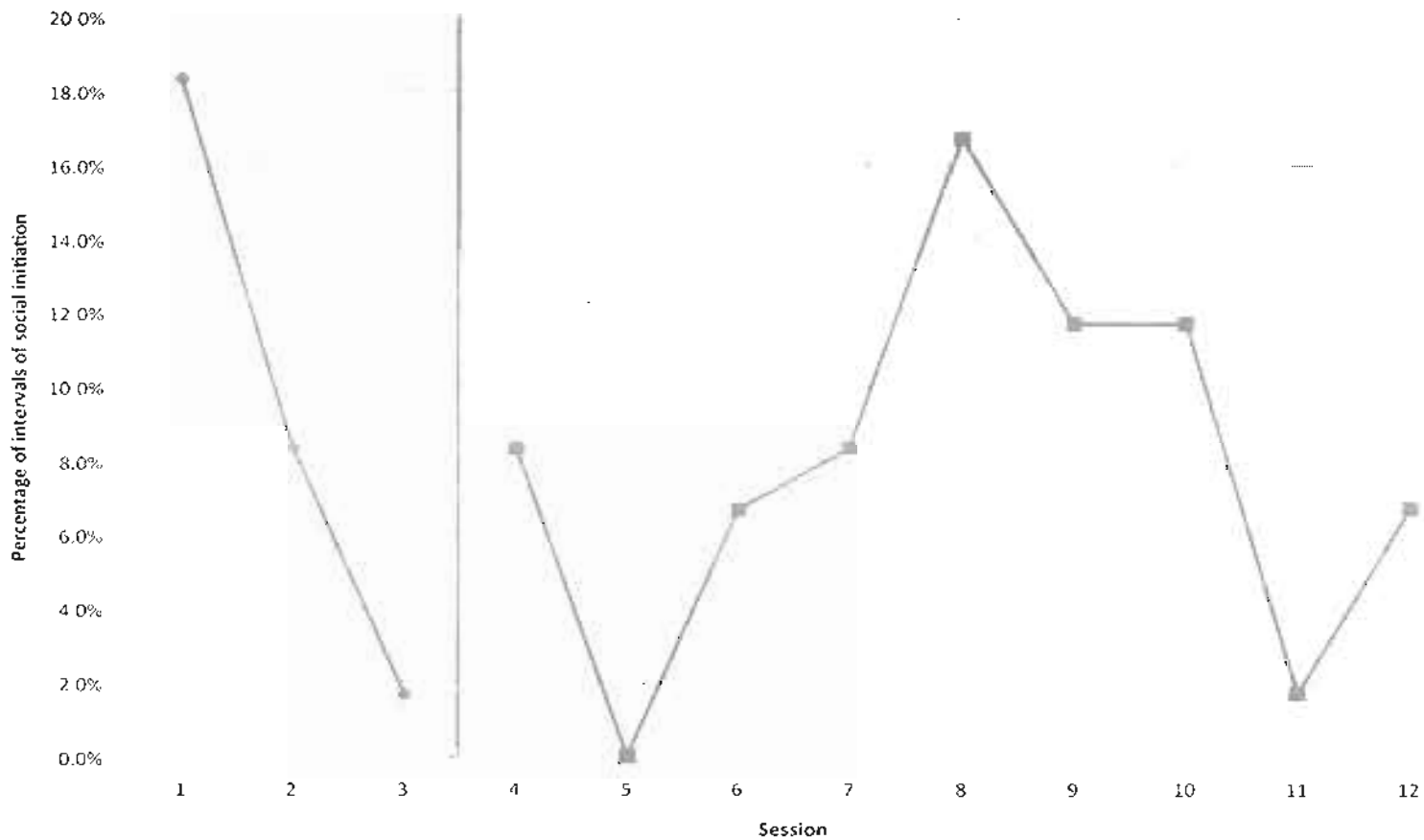


Figure 4. Social Initiations, Participant 2

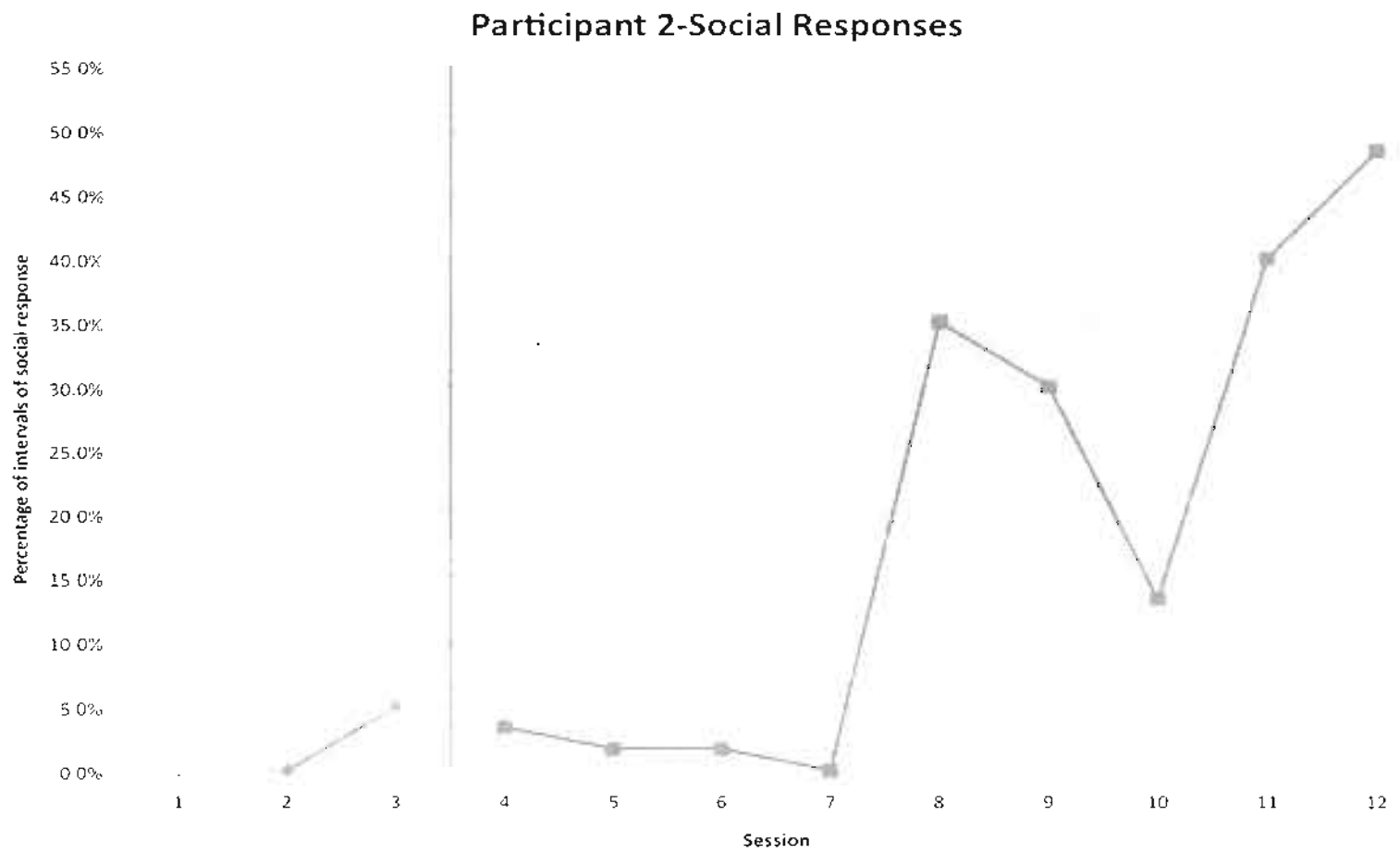


Figure 5. Social Responses, Participant 2

### Participant 2-Total Social Engagement

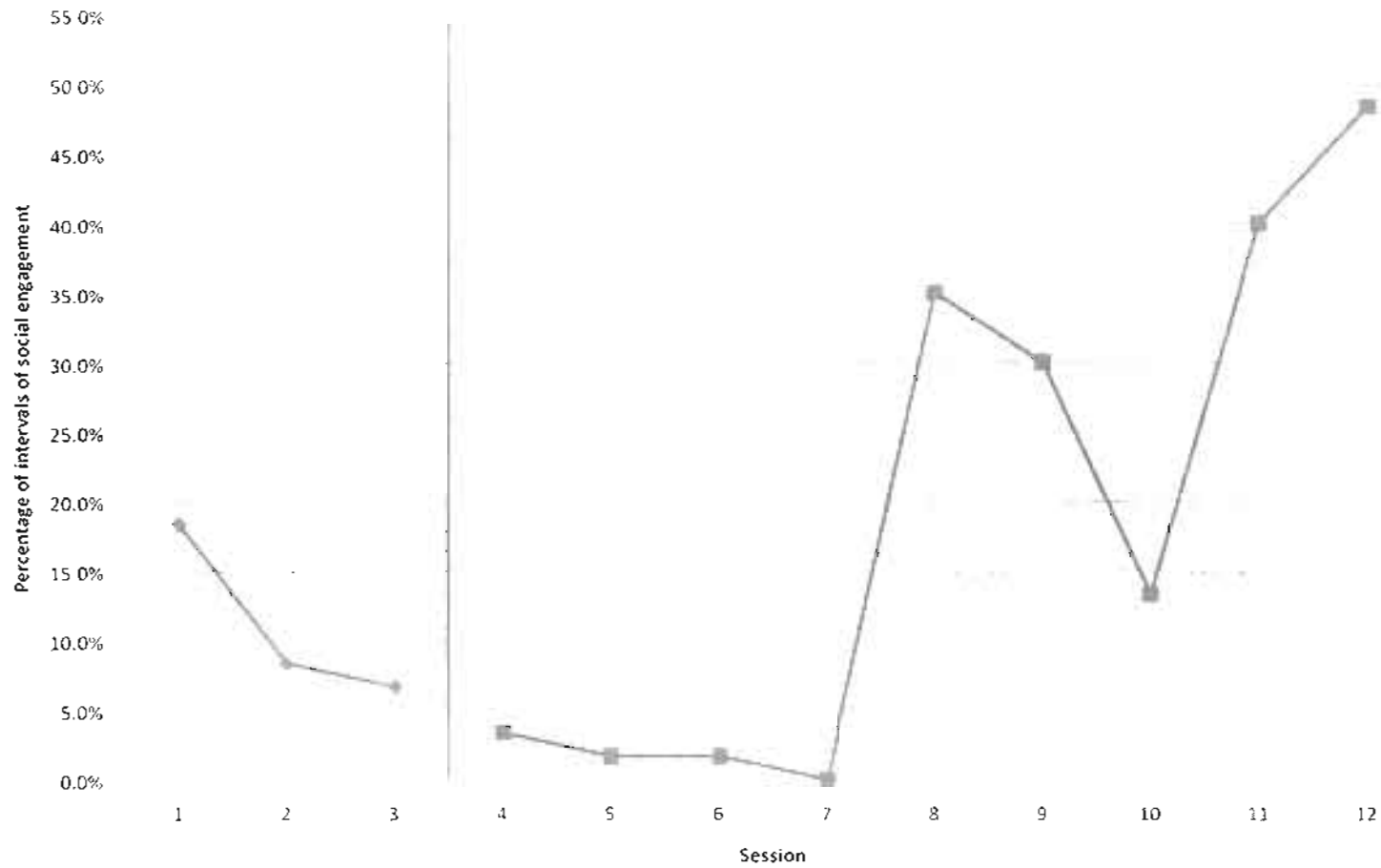


Figure 6. Total Social Engagement, Participant 2

Overall, participants in the didactic instruction group initiated social interactions during an average of 3.25% of intervals during baseline, and 6.3% during treatment. The 2 participants responded to others during an average of 7.75% of intervals of baseline, and 16.65% during treatment. Baseline social engagement was observed during 11.1% of intervals, with social engagement during 22.95% of treatment intervals. Using Cohen's metric to interpret effect sizes, a small effect size was observed for social initiations ( $ES=.46$ ), and large effect sizes were observed for social responses ( $ES=1.48$ ) and total engagement ( $ES=1.54$ ).

Participant 3, assigned to the didactic instruction group, was present for 15 of 16 social skill lessons. During the 10-minute baseline observations, Participant 3 initiated social interactions an average of 2.7% of intervals during baseline, and 10.6% during treatment. Participant 3 responded to others during 2.2% of intervals during baseline phase, and 18.1% during treatment phase. Social engagement during baseline was observed in an average of 5% of intervals, and in 28.7% of intervals during treatment (Figures 7, 8, and 9). Effect sizes were calculated for changes in social interactions ( $ES=1.76$ ), social responses ( $ES=2.76$ ), and for total social engagement ( $ES=3.09$ ). All effect sizes are classified as large by Cohen's metric for judging effect sizes. Percentage of nonoverlapping data points was calculated at 100%.

Participant 4, assigned to the didactic instruction group, was present for 16 of 16 social skill lessons. During the 10-minute baseline observations, Participant 4 initiated social interactions an average of 3.8% of intervals, and initiated interactions during 2.0% of treatment intervals. Participant 4 responded to others during 13.3% of intervals during baseline, and in 15.2% of treatment intervals. Social engagement was observed in an

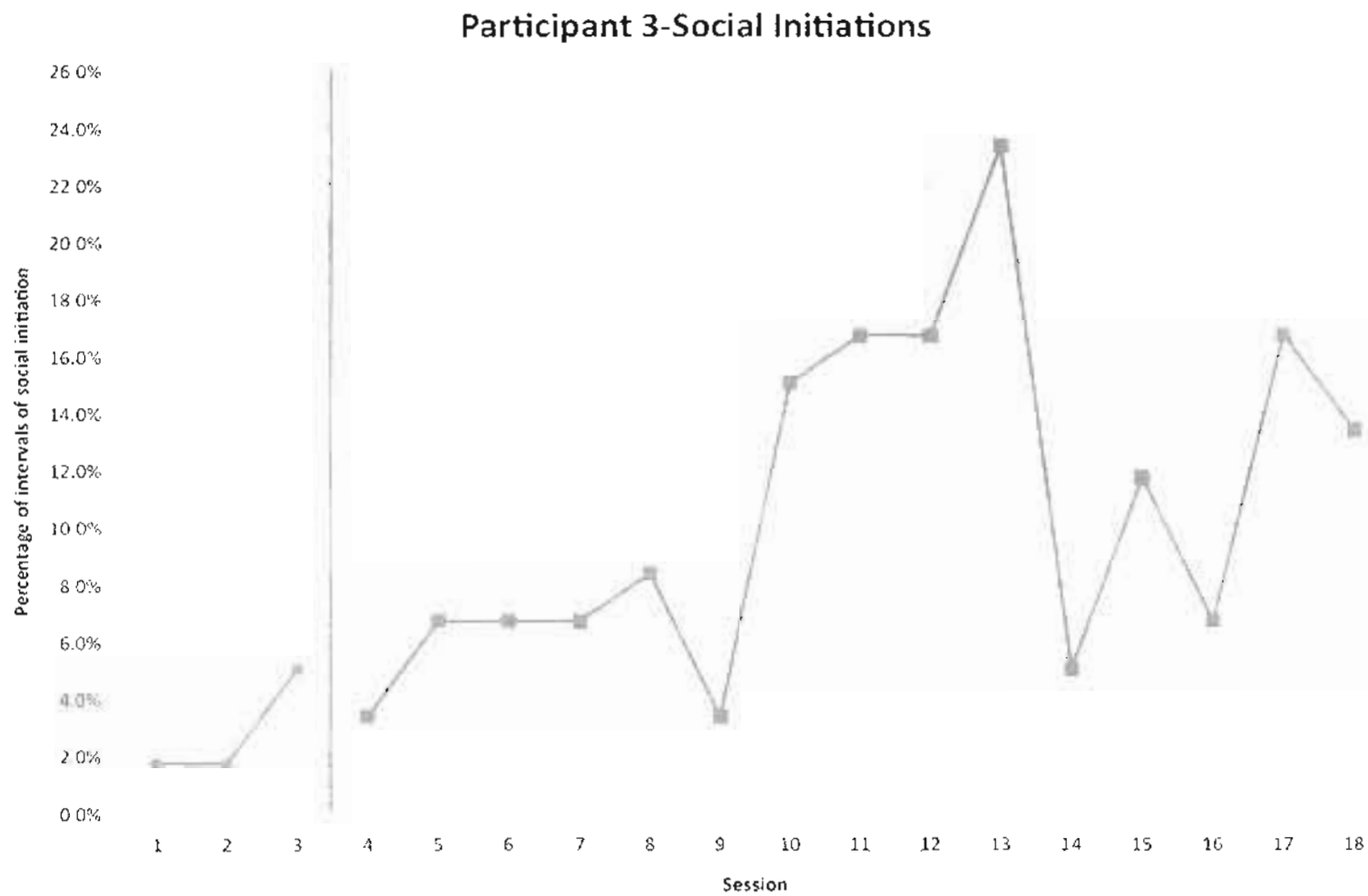


Figure 7. Social Initiations, Participant 3

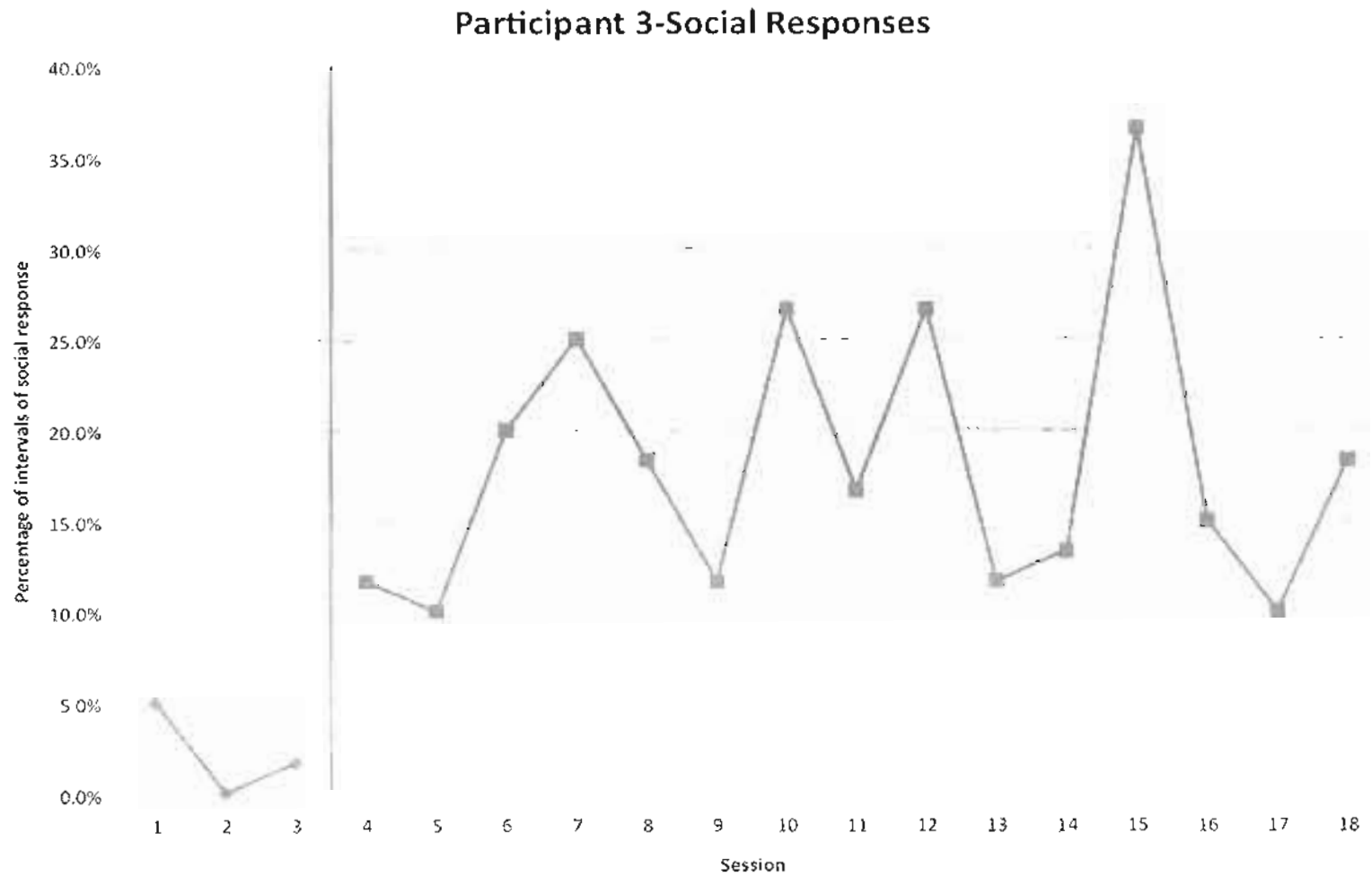


Figure 8. Social Responses, Participant 3



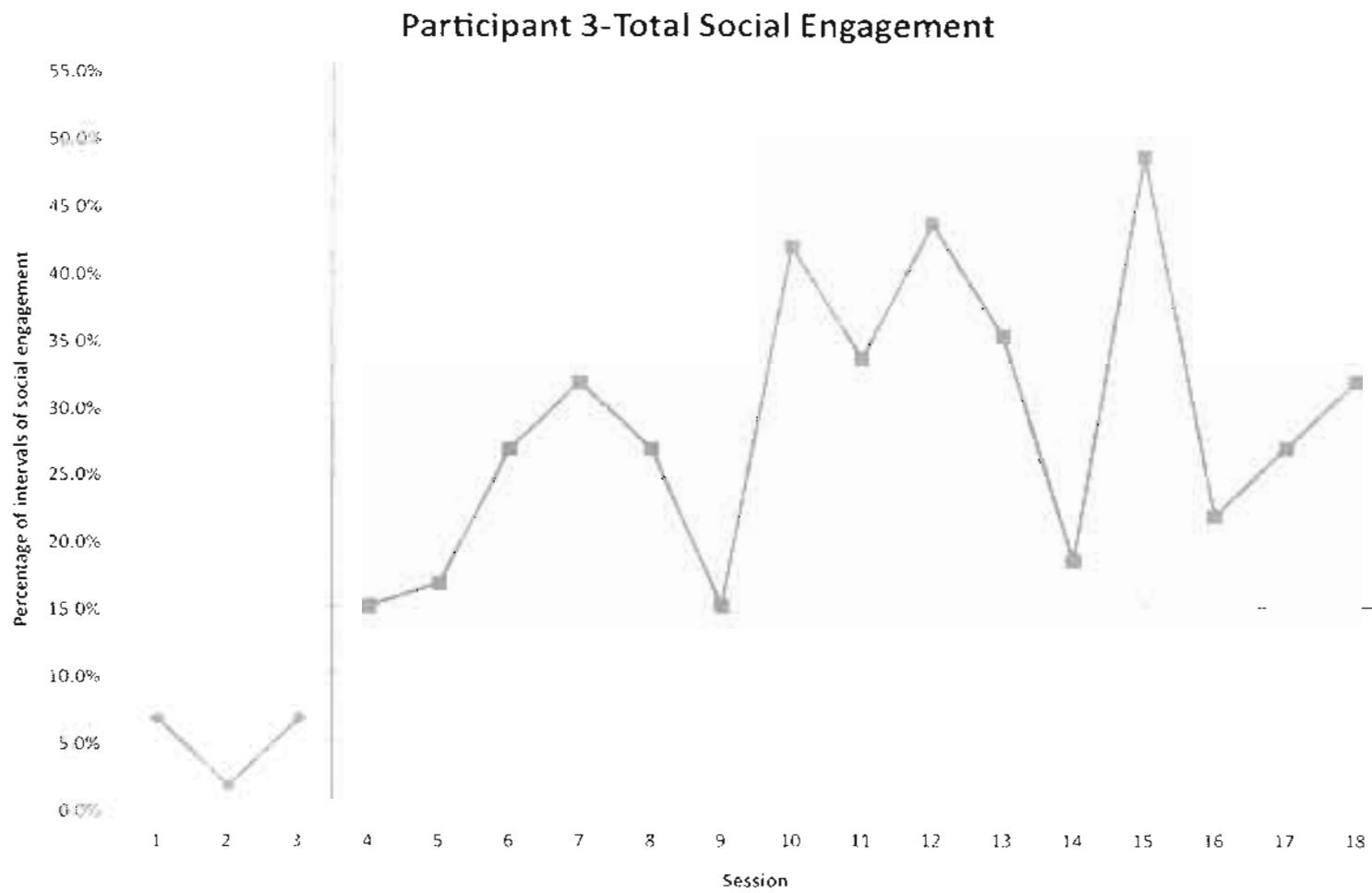


Figure 9. Total Social Engagement, Participant 3

average of 17.2% of baseline intervals, and in 17.2% of intervals during treatment (Figures 10, 11, and 12). Using Cohen's metric, the social initiation response was largely negative ( $ES=-0.83$ ), a small positive effect was observed in social responses ( $ES=.21$ ), and total social engagement was judged as no effect ( $ES=.0$ ). Percentage of nonoverlapping data points was calculated at 25%.

On average, participants in the didactic group improved substantially in social responding and total engagement, but only made small gains in social initiations. However, these gains are mainly the product of large improvements in all three areas in Participant 3. No such gains were observed in Participant 4. Because of this, no conclusion may be drawn about the efficacy of the didactic instruction included in this study. However, the gains of Participant 3 suggest that some components of the didactic intervention may be of utility in improving social skills in children with ASD. The research question was satisfied with the data collected.

### Research Question 3

*Using Cohen's (1988) effect size metric, does traditional didactic instruction or video-based instruction produce a greater effect size?*

On average, the didactic social skills group produced a higher average effect size for total social engagement ( $ES=1.54$ ) than did the video-based Superhero Social Skills group ( $ES=0.93$ ) (Table 3). However, this high effect size is due to substantial changes in social engagement in only 1 participant in the didactic group. Both participants in the video-based Superhero Social Skills group were observed to make substantial improvements in total social engagement through intervention. The

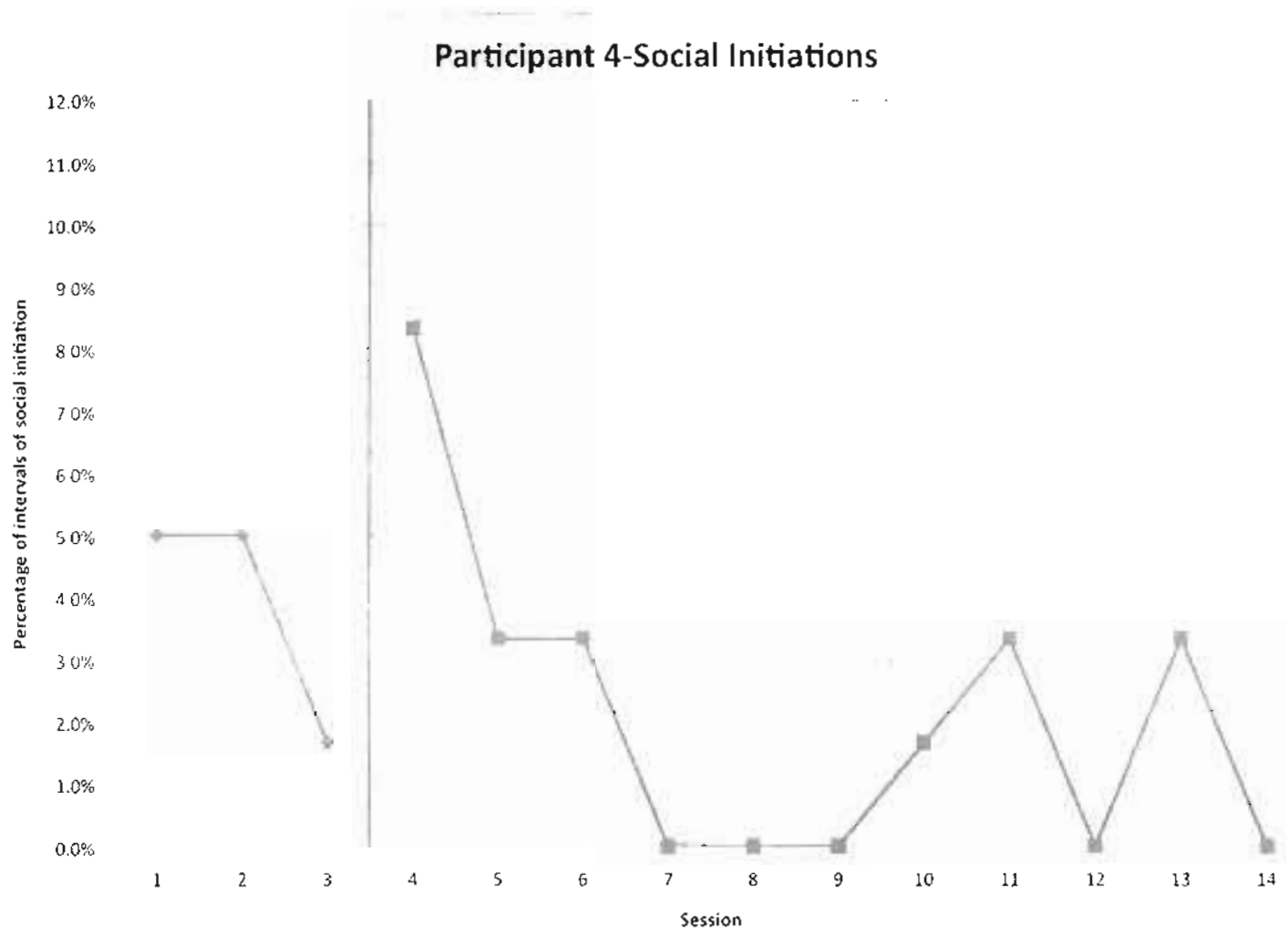


Figure 10. Social Initiations, Participant 4

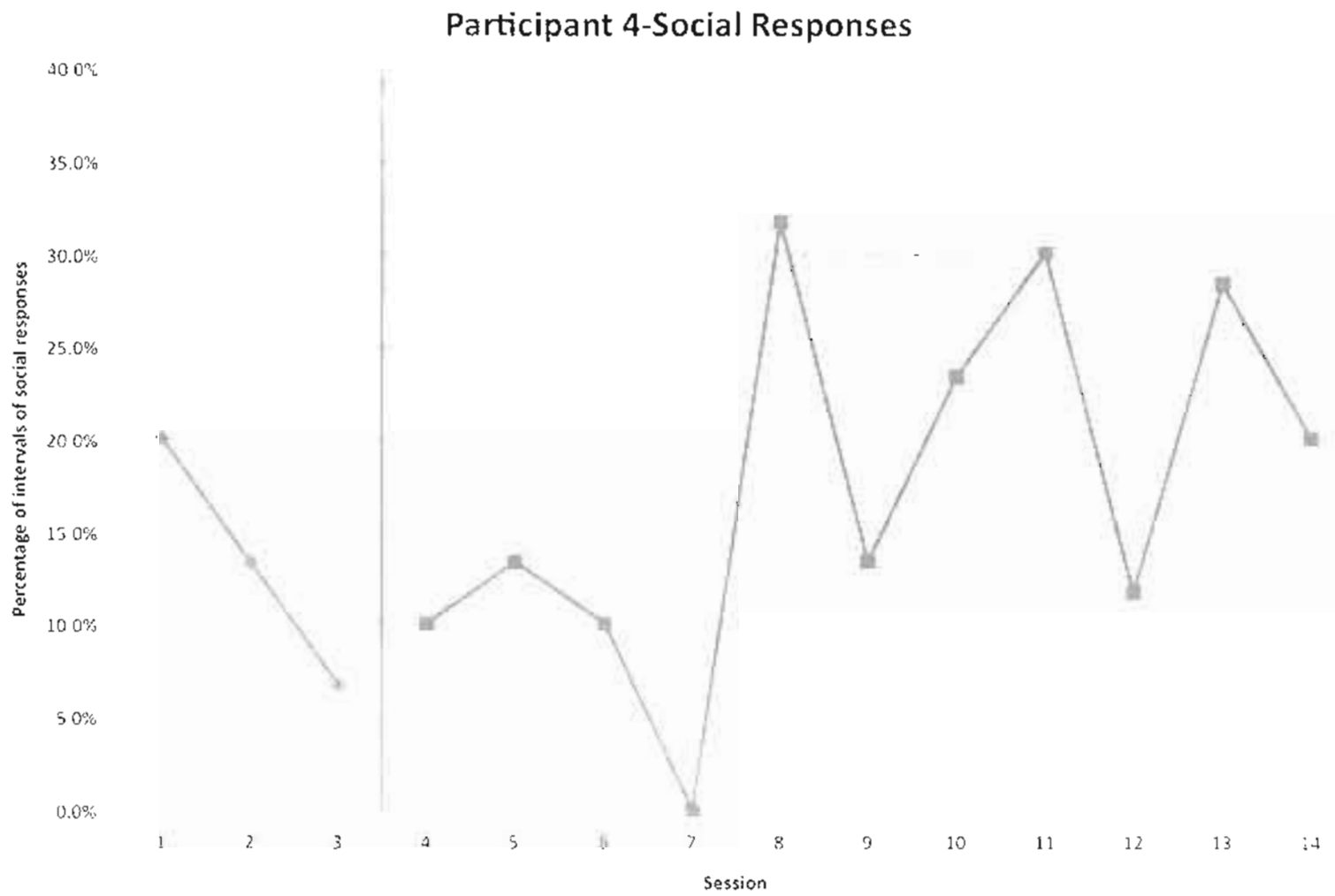


Figure 11. Social Responses, Participant 4

### Participant 4-Total Social Engagement

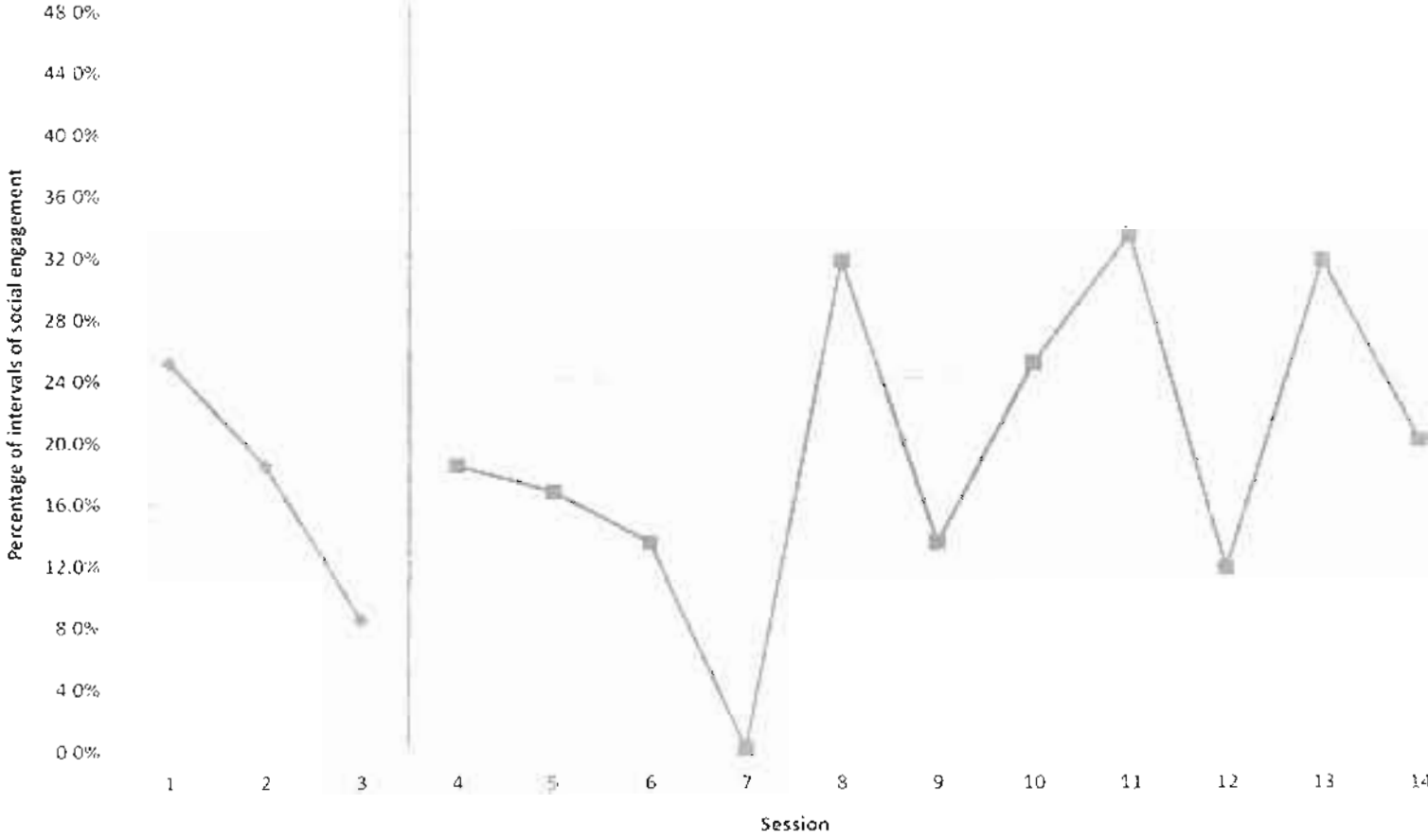


Figure 12. Total Social Engagement, Participant 4

Table 3

## Mean Effect Sizes by Group

Group	Social Initiations	Social Responses	Total Social Engagement
Didactic	0.46	1.48	1.54
Video-Based	0.29	0.99	0.93

didactic group also produced higher average effect sizes in social initiations ( $ES=0.46$ ) and social responses ( $ES=1.48$ ) than the video-based Superhero Social Skills group ( $ES=0.29$  and  $ES=0.99$ , respectively). Again, performance of the didactic instruction group is due to substantial improvement in only 1 participant. Overall, it can be determined that the video-based Superhero Social Skills program produced more positive results, satisfying the research question.

#### Research Question 4

*Comparing preintervention and postintervention scores, what are the changes in participants' Social Responsiveness Scale scores?*

On average, the four participants with ASD included in the study received a Social Awareness  $T$  score of 78.5 preintervention, and 69.9 postintervention as rated by parents. Social Cognition  $T$  scores rose slightly, from 73.25 preintervention to 74.3 postintervention, as rated by parents. Parents endorsed a decrease in Social Communication  $T$  scores, from 72 preintervention to 68 postintervention. Parent endorsement of Motivation  $T$  scores also decreased, from 66.75 preintervention to 51.3

postintervention. The Autistic Mannerisms *T* score dropped from 76.5 preintervention to 75.3 postintervention, as rated by parents. Lastly, Total SRS *T* score declined from 76 preintervention to 70.6, as rated by parents (Table 4).

For teacher ratings, the average of the 4 participants SRS scores rose slightly in the Social Awareness *T* score, from 52.25 preintervention to 55 postintervention. The Social Cognition *T* score remained approximately the same as rated by teachers, from 54.5 preintervention to 54.25 postintervention. The average Social Communication *T* score rose from 50.5 preintervention to 54.5 postintervention as rated by teachers. The average Motivation *T* score also rose, from 52.5 to 53.75 as rated by teachers. Similarly, the Autistic Mannerisms *T* score rose from 52.25 to 58 as rated by teachers. Overall, teachers evaluated the SRS Total *T* score as raising from 52 preintervention, to 55.75 postintervention (Table 4).

Table 4

Average Pre- and Postintervention SRS Scores, as Rated by Teachers and Parents,

	Social Awareness	Social Cognition	Social Communication	Motivation	Autistic Mannerisms	Total
Pre-Parent	78.5	73.25	72	66.75	76.5	76
Post-Parent	69.6	74.3	68	51.3	75.3	70.6
Pre-Teacher	52.25	74.5	50.5	52.5	52.25	52
Post-Teacher	55	54.25	54.25	53.75	58	55.75

For Participant 1, preintervention Parent SRS (Social Awareness,  $T=70$ ; Social Cognition,  $T=72$ ; Social Communication,  $T=72$ ; Motivation,  $T=62$ ; Autistic Mannerisms,  $T=79$ ; Total= $75$ ) and Teacher SRS (Social Awareness,  $T=57$ ; Social Cognition,  $T=64$ ; Social Communication,  $T=53$ ; Motivation,  $T=49$ ; Autistic Mannerisms,  $T=53$ ; Total= $55$ ) scores were compared to postintervention Parent SRS (Social Awareness,  $T=66$ ; Social Cognition,  $T=74$ ; Social Communication,  $T=68$ ; Motivation,  $T=58$ ; Autistic Mannerisms,  $T=79$ ; Total= $72$ ) and Teacher SRS scores (Social Awareness,  $T=63$ ; Social Cognition,  $T=66$ ; Social Communication,  $T=58$ ; Motivation,  $T=49$ ; Autistic Mannerisms,  $T=57$ ; Total= $59$ ) (Figure 13 and 14). Using Constantino's recommendations for determining substantial changes in SRS scores, no detectable changes were observed. Constantino recommends that a reduction in score by 2 standard errors of the mean—the standard deviation of the sampling distribution—be considered substantial. On the graphs,

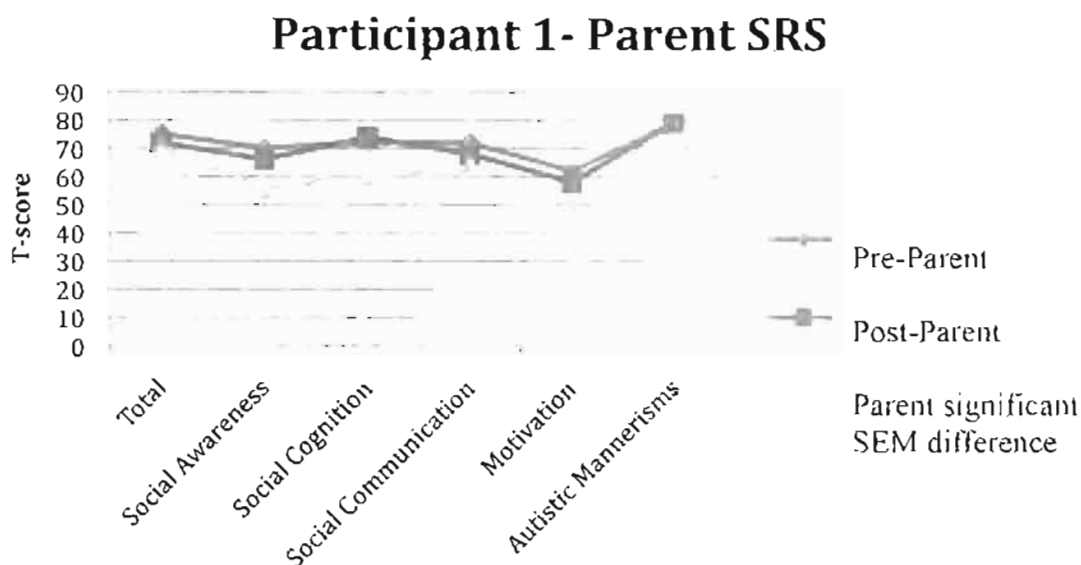


Figure 13. Parent SRS, Participant 1



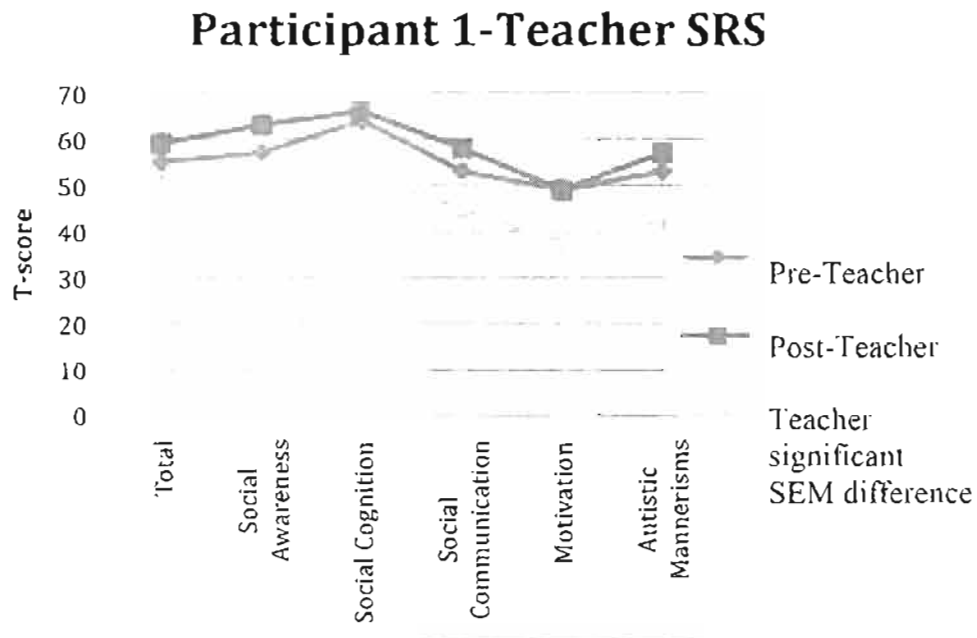


Figure 14. Teacher SRS, Participant 1

*Note: Post- scores below dashed line considered significant*

postscores falling below the dashed line—two standard error of measures below the pre-score—are considered substantial.

Similar results were observed in Participant 2. Preintervention Parent SRS (Social Awareness,  $T=78$ ; Social Cognition,  $T=61$ ; Social Communication,  $T=67$ ; Motivation,  $T=56$ ; Autistic Mannerisms,  $T=71$ ; Total= $69$ ) and Teacher SRS (Social Awareness,  $T=60$ ; Social Cognition,  $T=55$ ; Social Communication,  $T=56$ ; Motivation,  $T=51$ ; Autistic Mannerisms,  $T=56$ ; Total= $56$ ) were determined, but due to Participant 2's withdrawal from the school no postintervention parent SRS scores are available. Preintervention Teacher SRS scores were compared to postintervention Teacher SRS scores (Social Awareness,  $T=50$ ; Social Cognition,  $T=50$ ; Social Communication,  $T=58$ ; Motivation,  $T=59$ ; Autistic Mannerisms,  $T=60$ ; Total= $57$ ) (Figure 15 and 16). No

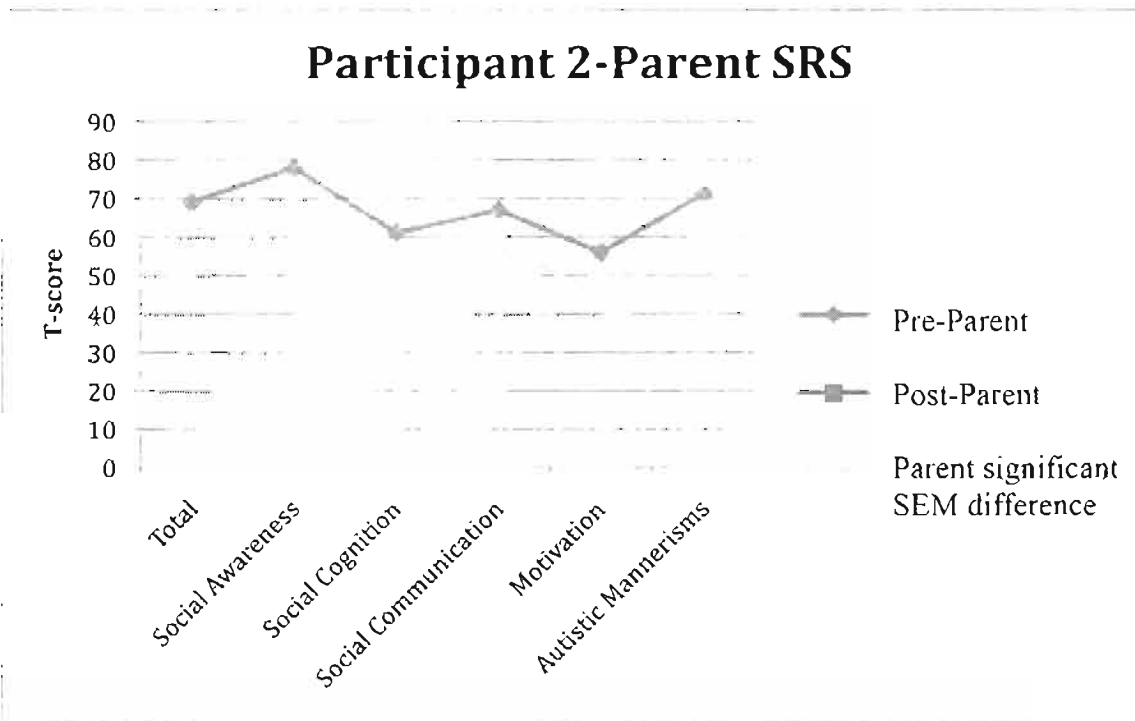


Figure 15. Parent SRS, Participant 2

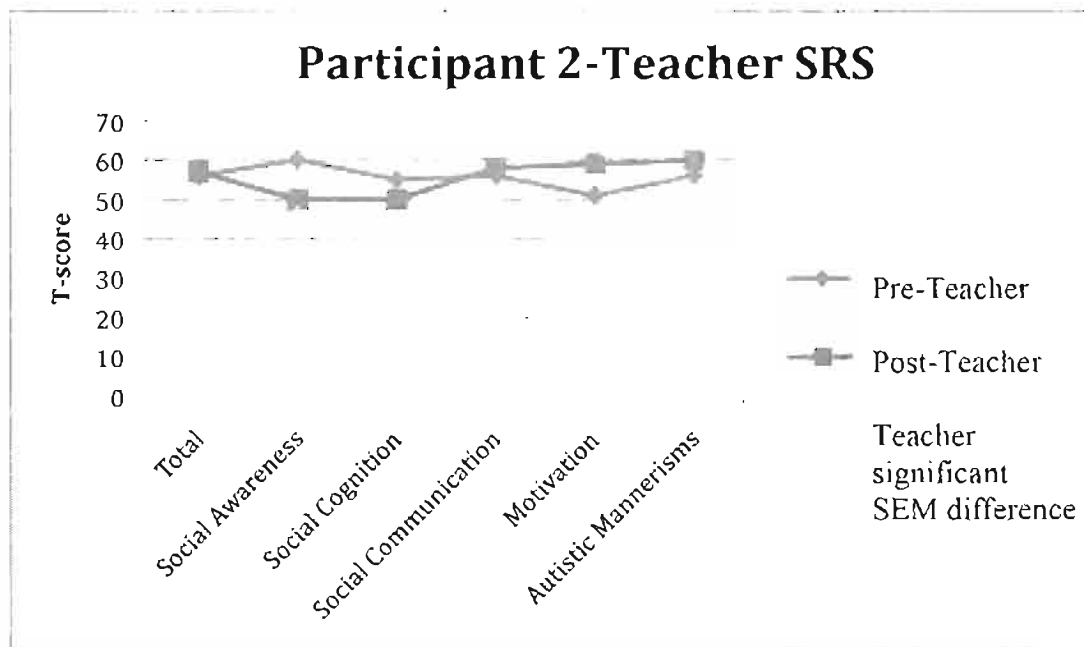


Figure 16. Teacher SRS, Participant 2

substantial changes were observed between pre- and postintervention Teacher SRS scores.

Preintervention Parent SRS for Participant 3 (Social Awareness,  $T=88$ ; Social Cognition,  $T=90$ ; Social Communication,  $T=85$ ; Motivation,  $T=90$ ; Autistic Mannerisms,  $T=80$ ; Total=90) and Teacher SRS (Social Awareness,  $T=40$ ; Social Cognition,  $T=51$ ; Social Communication,  $T=44$ ; Motivation,  $T=57$ ; Autistic Mannerisms,  $T=45$ ; Total=47) scores were compared to postintervention Parent SRS (Social Awareness,  $T=75$ ; Social Cognition,  $T=79$ ; Social Communication,  $T=74$ ; Motivation,  $T=56$ ; Autistic Mannerisms,  $T=78$ ; Total=76) and Teacher SRS scores (Social Awareness,  $T=45$ ; Social Cognition,  $T=51$ ; Social Communication,  $T=53$ ; Motivation,  $T=57$ ; Autistic Mannerisms,  $T=62$ ; Total=55) (Figure 17 and 18). Substantial decreases in scores were observed in Parent

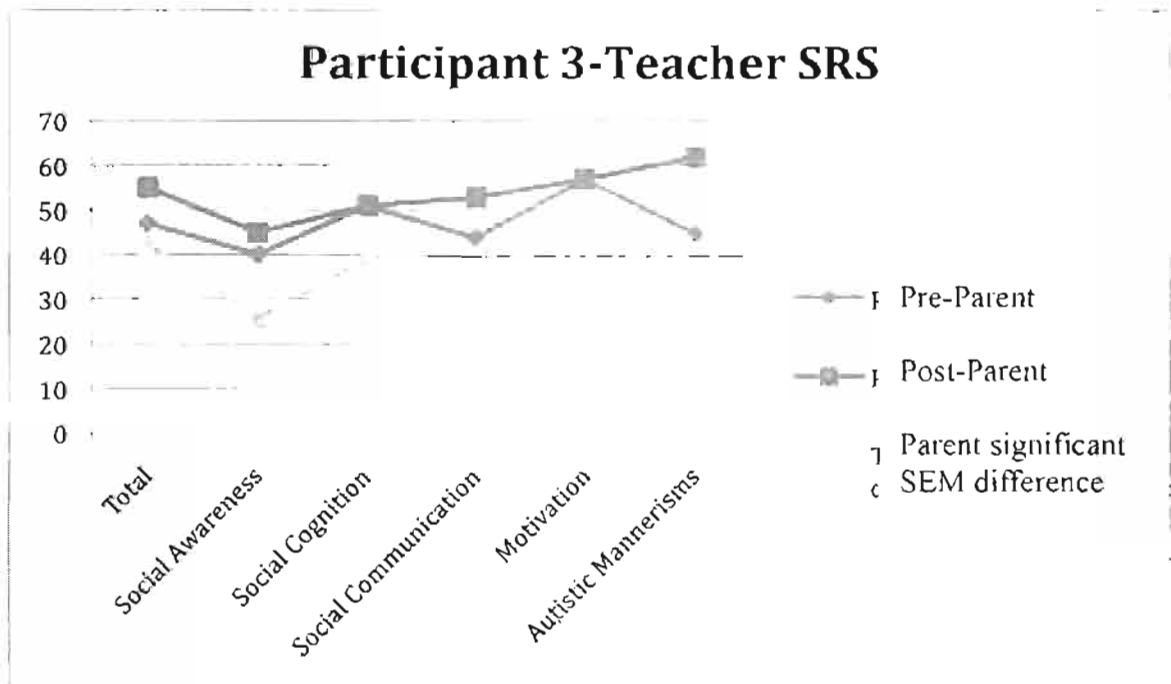


Figure 17. Parent SRS, Participant 3

## Participant 3-Parent SRS

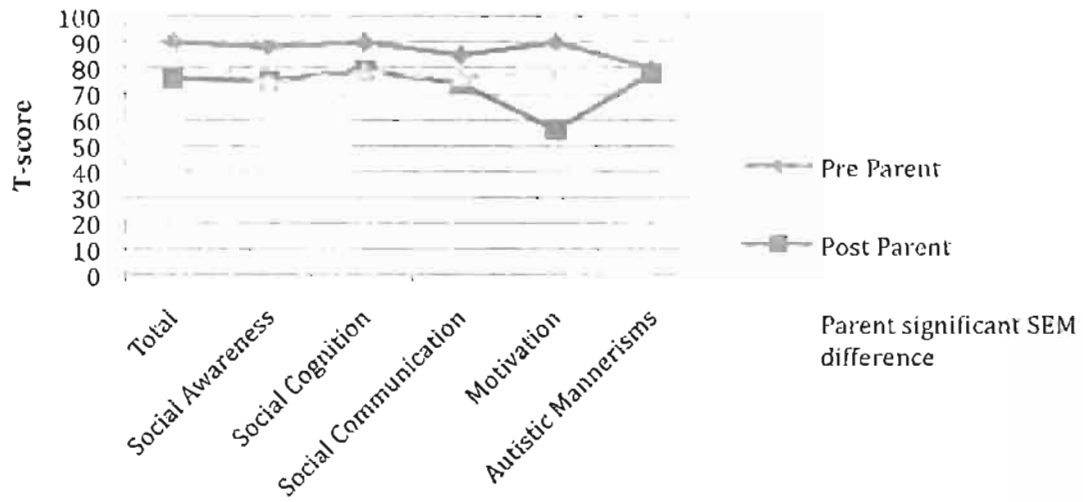


Figure 18. Teacher SRS, Participant 3

*Note: Post- scores below dashed line considered significant*

SRS Social Communication, Motivation, and Total scores.

For Participant 4, preintervention Parent SRS (Social Awareness,  $T=78$ ; Social Cognition,  $T=70$ ; Social Communication,  $T=64$ ; Motivation,  $T=59$ ; Autistic Mannerisms,  $T=76$ ; Total=70) and Teacher SRS (Social Awareness,  $T=52$ ; Social Cognition,  $T=48$ ; Social Communication,  $T=49$ ; Motivation,  $T=53$ ; Autistic Mannerisms,  $T=55$ ; Total=52) scores were compared to postintervention Parent SRS (Social Awareness,  $T=68$ ; Social Cognition,  $T=70$ ; Social Communication,  $T=62$ ; Motivation,  $T=40$ ; Autistic Mannerisms,  $T=69$ ; Total=64) and Teacher SRS scores (Social Awareness,  $T=62$ ; Social Cognition,  $T=50$ ; Social Communication,  $T=49$ ; Motivation,  $T=50$ ; Autistic Mannerisms,  $T=53$ ; Total=52) (Figure 19 and 20). Substantial decreases in scores were observed in Parent SRS Motivation and Total scores.

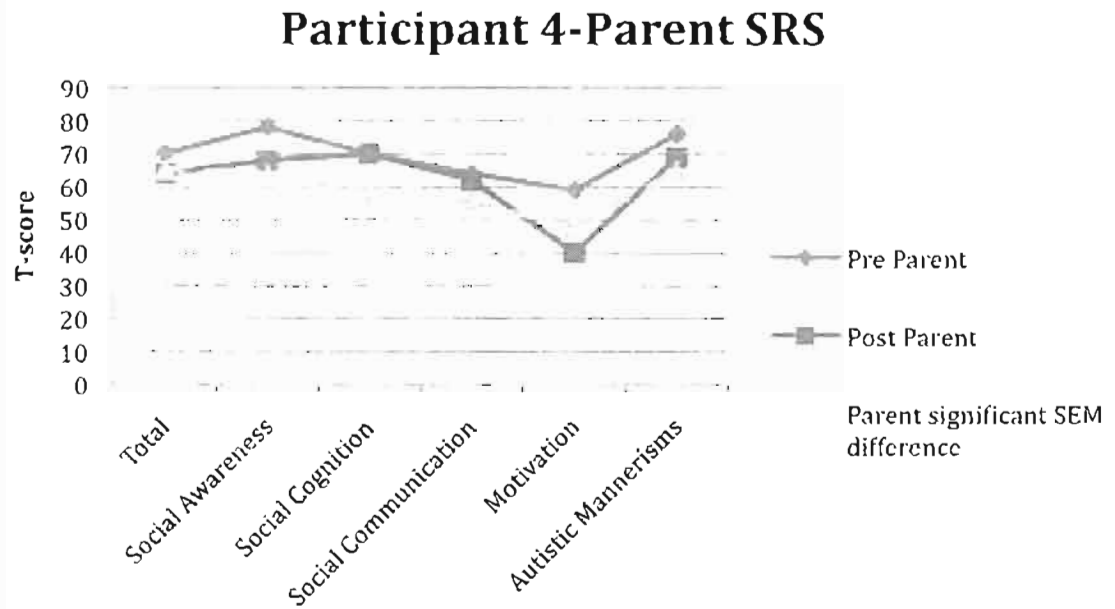


Figure 19. Parent SRS, Participant 4

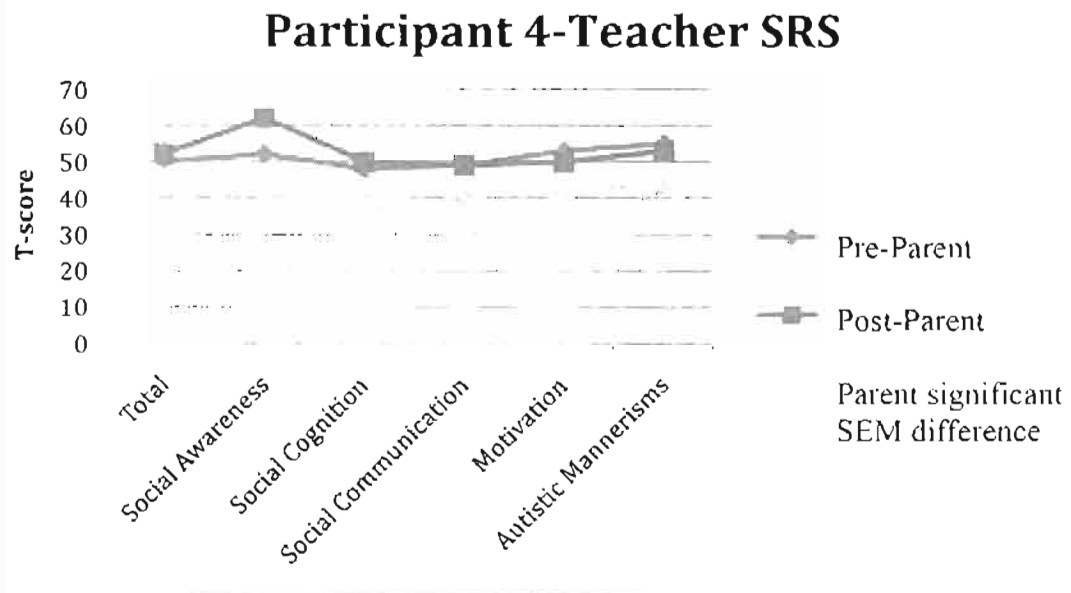


Figure 20. Teacher SRS, Participant 4

*Note: Post- scores below dashed line considered significant*

Overall, parents rated social awareness, social communication, autistic mannerisms, and total autistic symptomology as improving over the course of the intervention. Teachers only noted social awareness as improving, with the improvement being minimal. Individually, improvements were most consistently observed in the areas of Total symptoms, Social Cognition, and Motivation. However, the video-based intervention and the didactic instruction did not produce consistent results across subjects. It was also observed that parent ratings of behaviors improved substantially more than teacher ratings of behavior. The reason for differences in teacher and parent rating changes is unknown. The data collected from the study satisfy the research question, demonstrating that the interventions were effective in producing positive changes in participant SRS scores. However, incomplete data exists for parent-ratings of the video-based intervention due to the attrition of one subject.

#### Research Question 5

*Comparing preintervention and postintervention scores, what are the changes in participant's Autism Social Skills Profile scores, as rated by parents?*

On average, the 4 participants increased their total social abilities, as measured by the ASSP (pre=120.25, post=131). Social reciprocity was also rated as improving on average (pre=48, post=55). Overall, social participation/avoidance was rated as improving least (pre=35.25, post=35.6). Detrimental behaviors were seen as improving slightly overall (pre=27.25, post=30). Pre- and postmeasures are compared graphically in Figure 21.

### Average ASSP Score

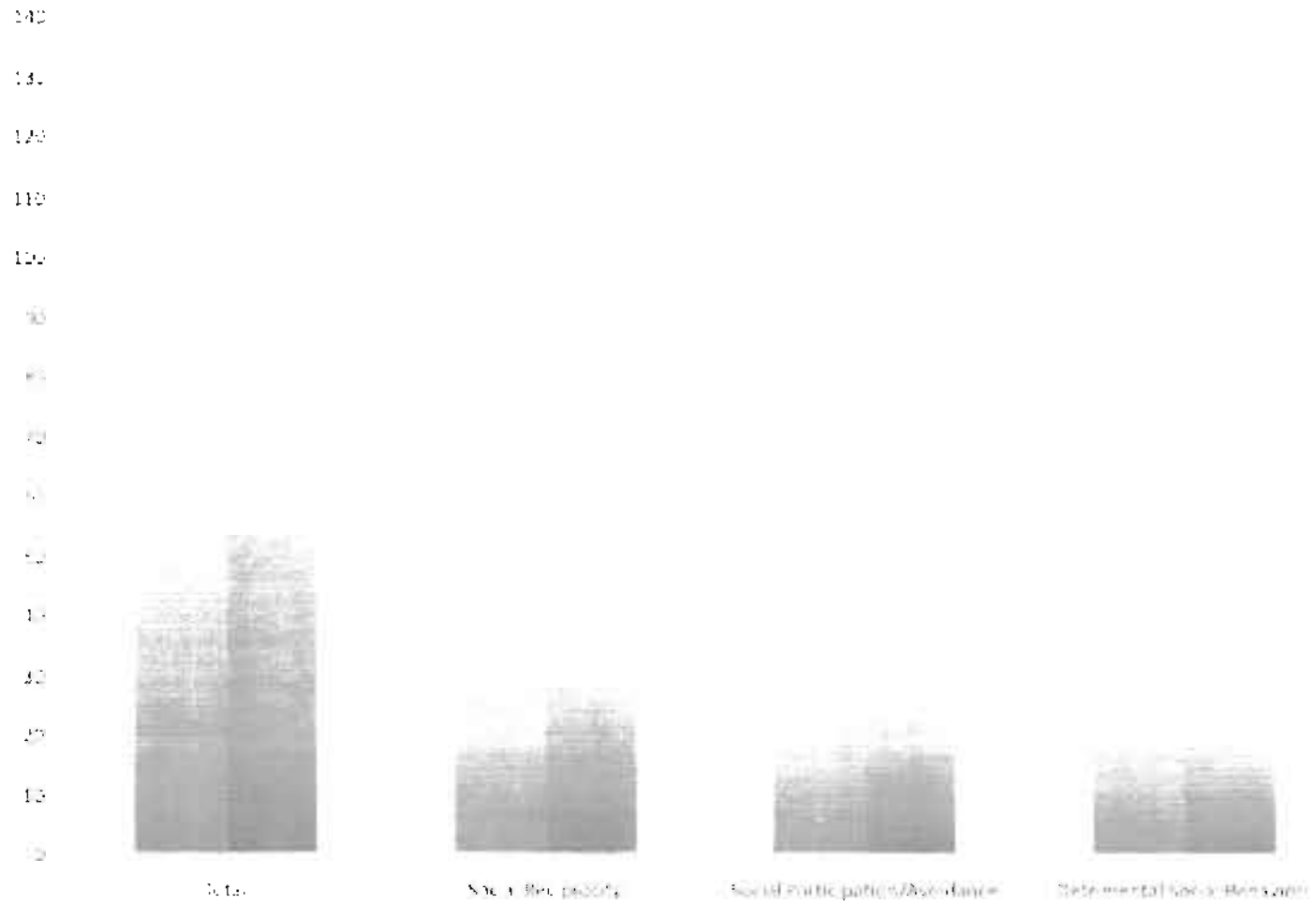


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Figure 21. Average ASSP Score

For Participant 1, scores from preintervention and postintervention ASSP scores were also compared (Figure 22). Total social skills abilities were rated as decreasing slightly (pre=135, post=126). Social reciprocity was judged as unchanging (pre=54, post=54). Social participation/avoidance (pre=37, post=36) and detrimental social behavior scores (pre=33, post=27) both decreased.

Due to Participant 2's withdrawal from the program, no follow-up parent ASSP data was able to be collected. Preintervention ASSP data is presented in Figure 23. Pre- and postintervention ASSP were also compared for Participant 3, revealing small positive changes in all scales (Figure 24). Participant 3 was rating as having higher social reciprocity abilities (pre=36, post=49), exhibiting more social participation (pre=29, post=31), and having fewer detrimental social behaviors (pre=23, post=30). Overall, Participant 3 was rated as possessing more social skills at the conclusion of the intervention (pre=96, post=122).

For Participant 4, positive overall changes were observed between pre- and postintervention ASSP scores (Figure 25). Improvement was observed on all scales of the ASSP. Social reciprocity (pre=48, post=62) and social participation skills (pre=39, post=40) were rated as improving with intervention. Detrimental social behaviors were judged as decreasing (pre=25, post=33). Overall social skills were also judged as improving with the didactic Superhero Social Skills intervention (pre=122, post=145). Overall, the ASSP data suggests that the didactic intervention was effective in improving social skills in all participants in all subscale areas except Detrimental Social Behaviors. The video-based intervention produced only decreases in the Detrimental Social Behaviors scale. However, the video-based intervention is incomplete due to attrition of



### Participant 1-Parent ASSP

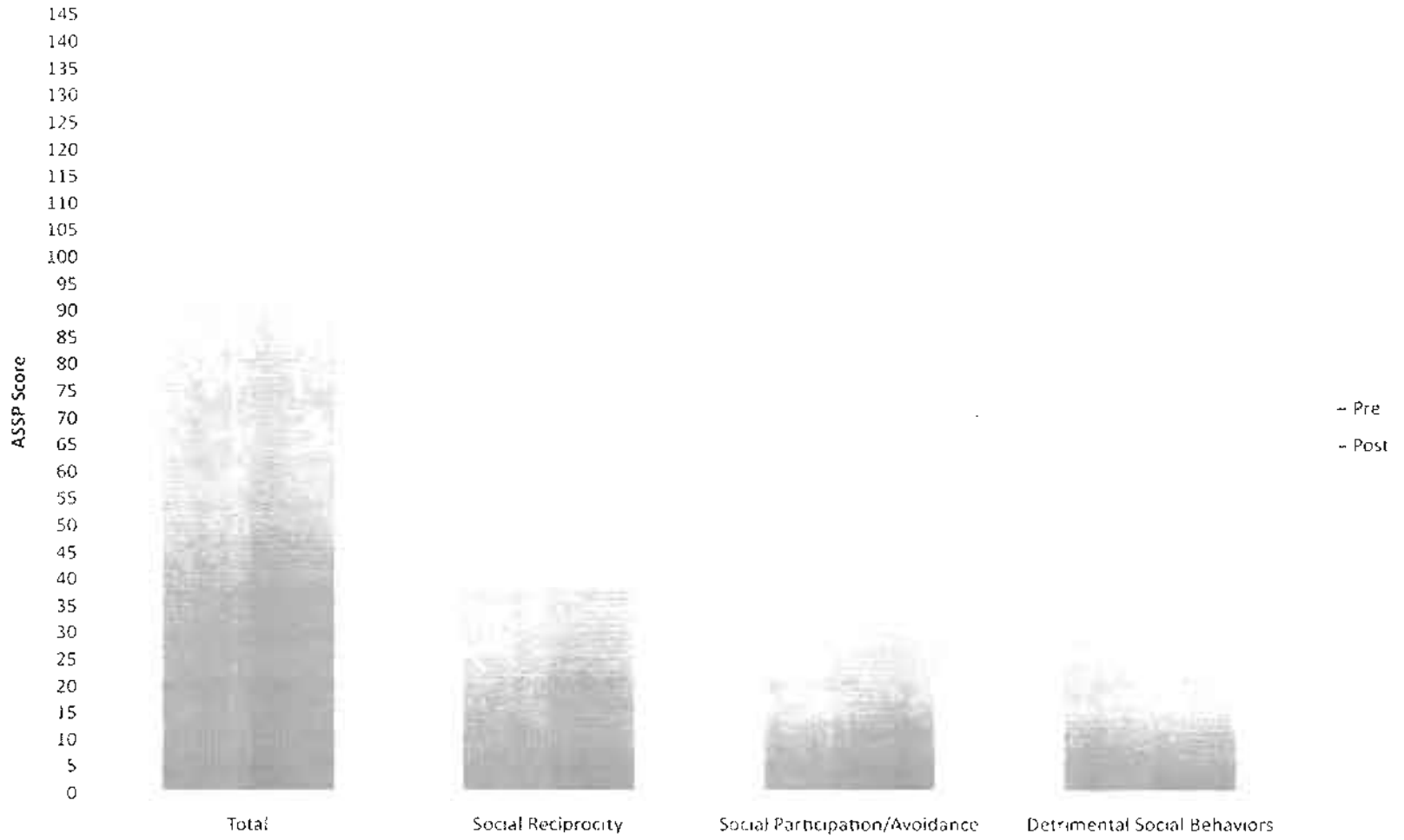


Figure 22. ASSP, Participant 1

## Participant 2-Parent ASSP

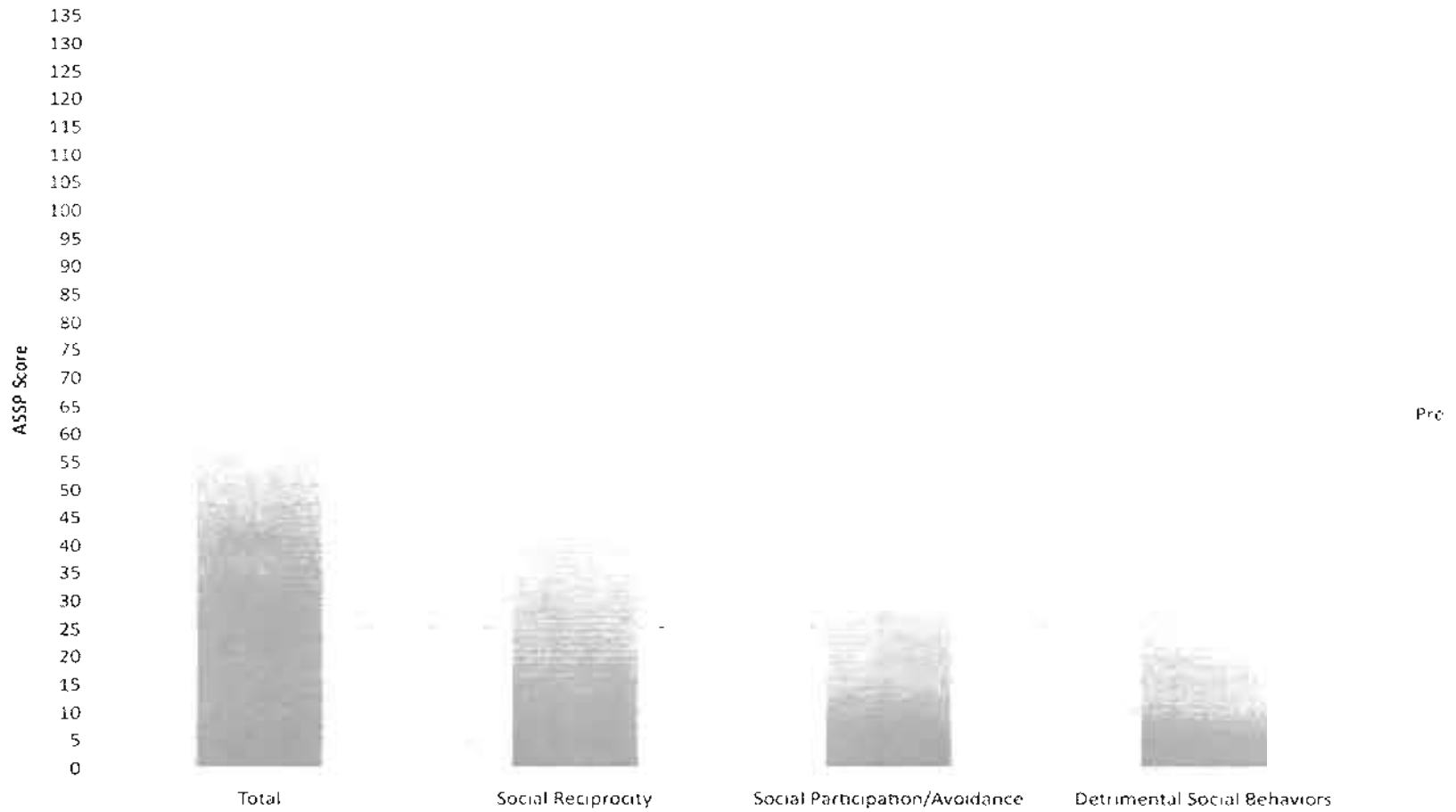


Figure 23. ASSP, Participant 2

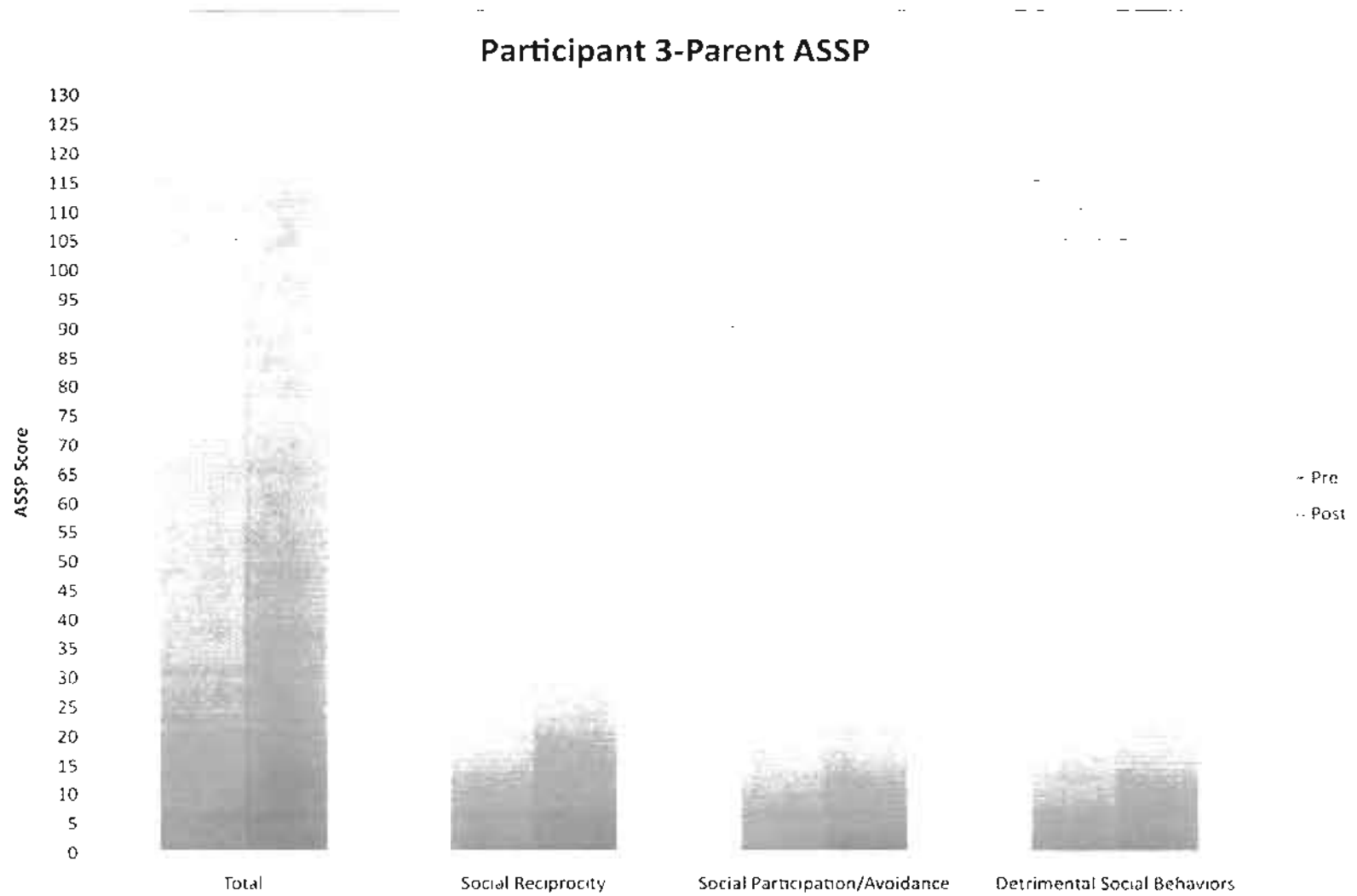


Figure 24. ASSP, Participant 3

### Participant 4-Parent ASSP

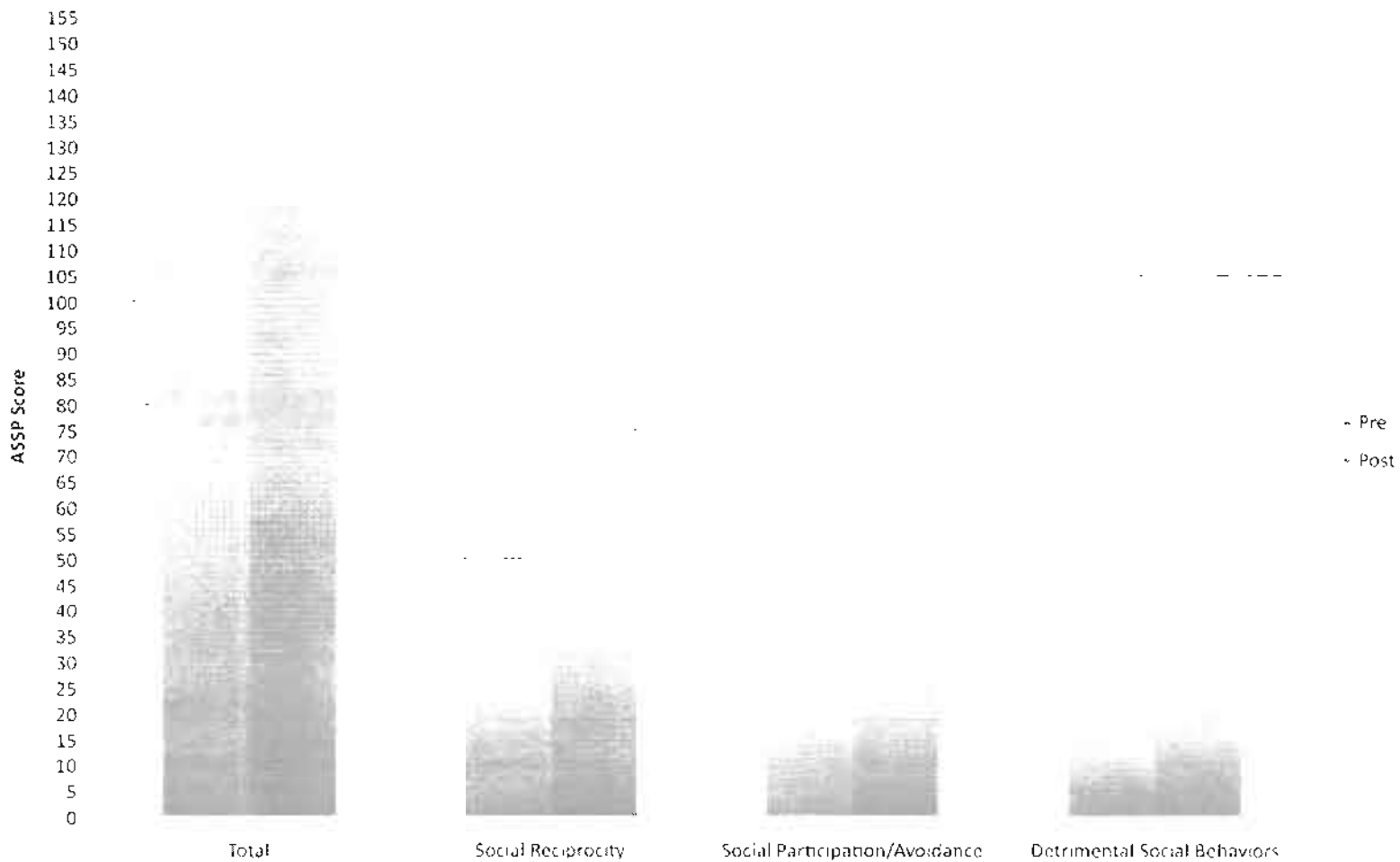


Figure 25. ASSP, Participant 4

1 of 2 subjects. Therefore, the data is not generalizable. On average, the two interventions produced observable increases in Total Social Skill abilities, as measured by the ASSP. Because the data is uninterruptible for the video-based group, the research question is not satisfied.

### Research Question 6

*What is the correlation between number of circles filled in on each participant's Power Cards and their percentage of social engagement during analog free time?*

Averaged across participants in both groups, there was no significant correlation between Power Charges received and total engagement during analog play periods [ $r = -.142, n = 30, p = .462$ ]. Analysis also revealed no significant correlation between receiving Scooter Cards during instruction and total engagement during analog free play [ $r = -.121, n = 55, p = .377$ ]. No significant correlation was found between receiving Black Hole Cards and total engagement during analog free play [ $r = .067, n = 55, p = .626$ ]. Correlations are presented in Table 5.

For Participant 1, the Pearson product-moment correlation coefficient calculated revealed no correlation between Power Charges and percentage of total social engagement [ $r = .405, n = 8, p = .319$ ]. It also revealed no correlation between receiving Scooter Cards and total social engagement [ $r = .043, n = 15, p = .877$ ]. No significant correlation was observed between receiving Black Hole cards and total social engagement [ $r = -.165, n = 15, p = .555$ ].

Similarly for Participant 2, the Pearson product-moment correlation coefficient calculated revealed no significant correlation between Power Charges and percentage of

Table 5

## Pearson Product-Moment Correlation Coefficients

	Power Charges		Scooter Cards		Black Hole Cards	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Participant 1	.405	.319	.043	.877	.165	.55
Participant 2	-.496	.316	-.319	.401	.122	.754
Participant 3	.239	.567	-.405	.133	-.049	.860
Participant 4	-.088	.835	-.003	.989	-.172	.523
Total	-.142	.462	-.121	.377	.067	.626

total social engagement [ $r=-.496, n=6, p=.316$ ]. It also revealed no correlation between receiving Scooter Cards and total social engagement during analog free play [ $r=-.319, n=9, p=.401$ ]. No significant correlation was observed between receiving Black Hole cards and total social engagement [ $r=.122, n=9, p=.754$ ].

As with Participants 1 and 2, the Pearson product-moment correlation coefficient calculated for Participant 3 revealed no correlation between Power Charges and percentage of total social engagement [ $r=.239, n=8, p=.567$ ]. It also revealed no significant correlations between receiving Scooter Cards and total social engagement [ $r=-.405, n=15, p=.133$ ]. No significant correlation was observed between receiving Black Hole cards and total social engagement [ $r=-.049, n=15, p=.860$ ].

For Participant 4, the Pearson product-moment correlation coefficient calculated revealed no correlation between Power Charges and percentage of total social engagement [ $r=-.088, n=8, p=.835$ ]. It also revealed no significant correlations between receiving Scooter Cards and total social engagement [ $r=-.003, n=16, p=.989$ ]. No significant correlation was observed between receiving Black Hole cards and total social engagement [ $r=-.172, n=16, p=.523$ ].

Overall, it appears that receiving Scooter Cards and Black Hole Cards is uncorrelated to total social engagement during analog play periods. It is also clear that receiving Power Charges is not correlated with total social engagement during analog play periods. The data collected from this study are sufficient to satisfy the research question.

#### Research Question 7

*What is the improvement in following group rules, as measured by the number of Scooter Cards and Black Hole cards distributed during each social skills lesson?*

Overall, no changes in rule following behaviors were observed in the didactic instruction and video-based Superhero Social Skills groups. On average, a decrease in the number of Scooter Cards received dropped after the first two sessions, which then stabilized. The average number of Black Hole Cards received remained low throughout the entire intervention (Figure 26).

For Participant 1, a slight decrease in the number of Scooter Cards received was observed (Figure 27). Participant 1 did not engage in rule breaking behaviors, and never received a Black Hole Card. A drop in the number of Scooter cards received was observed in Participant 2, while Black Hole Cards remained at a low level (Figure 28). Similar patterns were observed in Participant 3 (Figure 29). After an initial burst of Scooter Cards, acquisition of cards maintained a similar level throughout the remainder of the intervention. Black Hole Cards were infrequently distributed to Participant 3.

Participant 4 demonstrated similar behavior—after an initial burst of Scooter Cards, card acquisition dropped slightly but maintained a similar level during the

### Average across participants

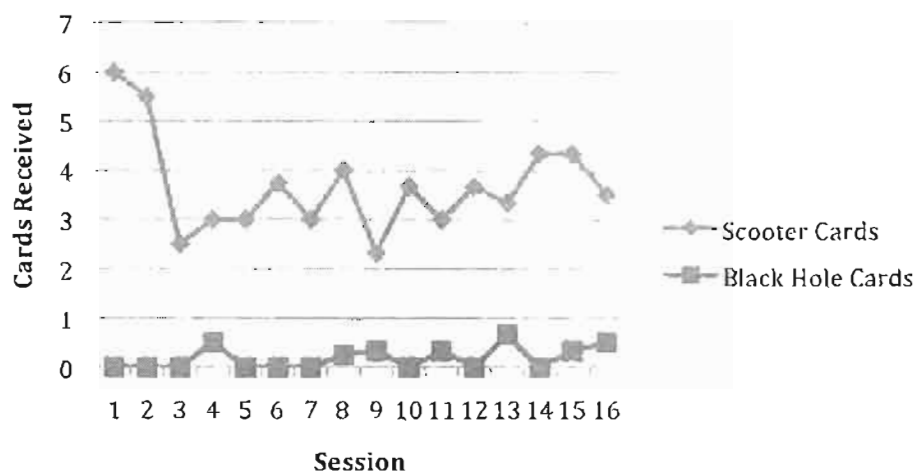


Figure 26. Scooter Cards and Black Hole Cards, Average

### Participant 1

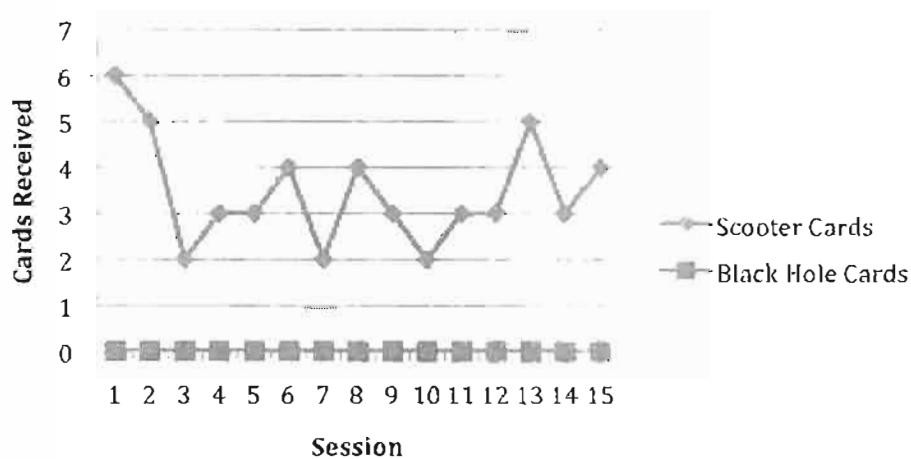


Figure 27. Scooter Cards and Black Hole Cards, Participant 1



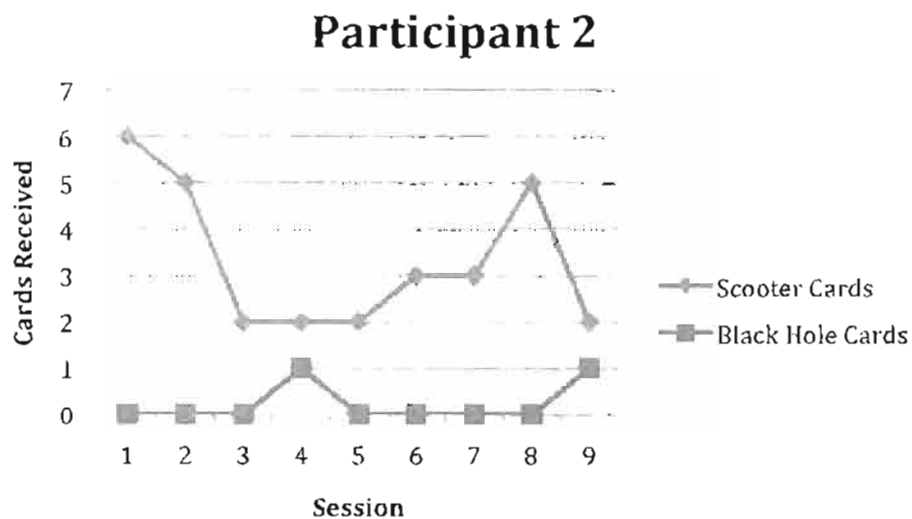


Figure 28. Scooter Cards and Black Hole Cards, Participant 2

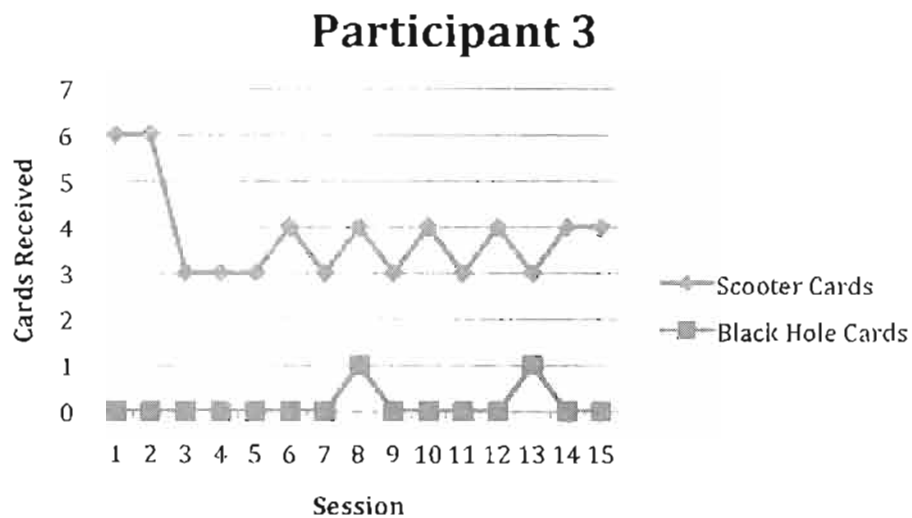


Figure 29. Scooter Cards and Black Hole Cards, Participant 3

remainder of the intervention (Figure 30). Black Hole Cards were received at a higher frequency during the final sessions than during initial sessions.

Initial high levels of Scooter Card distribution can be attributed to initial shaping of rule following behaviors during the first social skills lessons. Due to the fact that no participant received more than one Black Hole Card per lesson, it is suggested that distribution of Black Hole Cards is effective in deterring rule-breaking behaviors. The data obtained in this study adequately satisfy the research question.

#### Research Question 8

*What is the social validity: according to teachers, as measured by the BIRS?*

Teachers of children in the didactic group also assessed the group as socially valid and favorable ( $M=4.81$ ) on a scale of 1 to 6, 1 being strongly unfavorable and 6 being

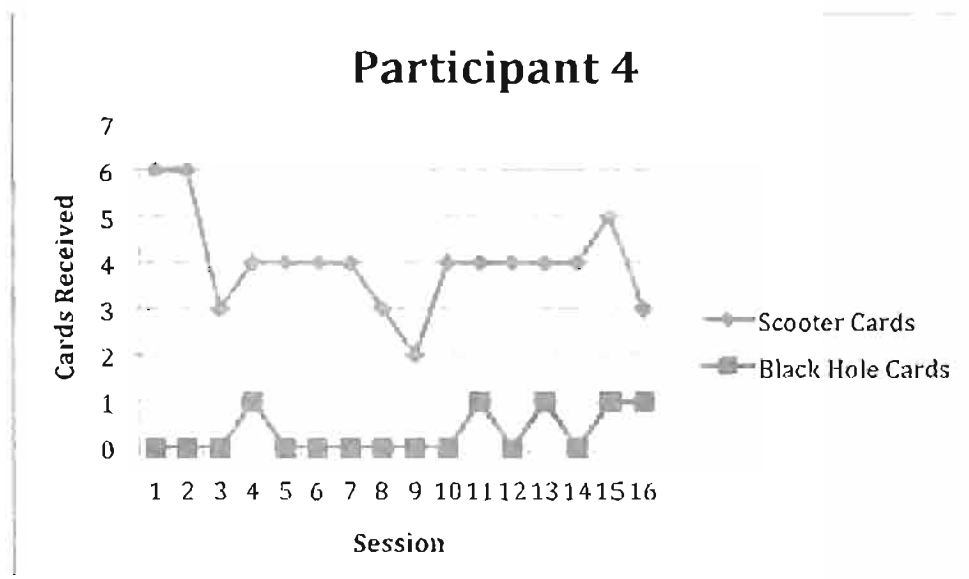


Figure 30. Scooter Cards and Black Hole Cards, Participant 4

very favorable. Teachers of children in the video-based social skills group also evaluated the Superhero Social Skills program as favorable socially valid ( $M=4.70$ ). Individual item means are presented in Table 6. Items rated least favorable by parents were the following: Superhero Social Skills would improve a child's behavior to the point that it would not noticeably deviate from other peer's behaviors; other behaviors related to social skills also are likely to be improved by Superhero Social Skills; and Superhero Social Skills should produce enough improvement in social skills so the behavior is no longer a problem. Overall, teachers believed that the Superhero Social Skills treatment would produce favorable results, but the results would not be sufficient to overcome all social skill deficits in a child with ASD. The data obtained in this study are sufficient to satisfy the research question.

#### Research Question 9

*What is the social validity according to parents, as measured by the BIRS?*

Parents whose children participated in the didactic social skills group rated the overall intervention as favorable ( $M=4.64$ ) on a scale of 1 to 6, 1 being strongly unfavorable and 6 being very favorable. An average of BIRS scores of parents whose children participated in the video-based social skills group was not available due to the withdrawal of one subject from the school where the current study was conducted. However, the BIRS data gathered from Participant 1's parent reflected a favorable assessment of the intervention ( $M=4.79$ ). Individual BIRS item means are presented in Table 6.

Items that received the least favorable ratings from parents were the following:

Table 6

## BIRS Item Means

Item	Didactic parent mean	Didactic teacher mean	Video parent score	Video teacher mean	Total mean
1. Superhero Social Skills would be an acceptable intervention to improve social skills	5	5	5	5	5
2. Most parents/teachers would find Superhero Social Skills appropriate for social skills intervention	5	4.5	5	4.5	4.75
3. Superhero Social Skills should prove effective in targeting social skills	5	5	5	5	5
4. I would suggest the use of Superhero Social Skills to other parents/teachers	5	5	6	5	5.25
5. Poor social skills in my child/student are severe enough to warrant use of Superhero Social Skills	3.5	6	5	5.5	5
6. Most parents would find Superhero Social Skills suitable in targeting social skills	4.5	4	5	4.5	4.75
7. I would be willing to use Superhero Social Skills in my home/classroom	5	5.5	6	5.5	5.5
8. Superhero Social Skills would not result in negative side effects for the child	5.5	5	6	5	5.375
9. Superhero Social Skills would be an appropriate intervention for a variety of children	4.5	5	5	5	4.875
10. Superhero Social Skills is consistent with other social skills programs I have used	5	5.5	4	5.5	5
11. Superhero Social Skills is a fair way to teach social skills	5	5.5	5	5.5	5.25

Table 6 Continued

Item	Didactic parent mean	Didactic teacher mean	Video parent score	Video teacher mean	Total mean
12. Superhero Social Skills is reasonable for difficulties that arise from social skills	5	6	5	5.5	5.375
13. I like the procedures used in Superhero Social Skills	5	6	5	5.5	5.375
14. Superhero Social Skills is a good way to handle social skills at home	5	5	6	5	5.25
15. Overall, Superhero Social Skills would be beneficial for my child	5	5	5	5	5
16. Superhero Social Skills would quickly improve a child's behavior	4.5	4.5	4	4	4.25
17. Superhero Social Skills would produce a lasting improvement in a child's behavior	4.5	5	5	5	4.875
18. Superhero Social Skills would improve a child's behavior to the point that it would not noticeable deviate from other peer's behavior	4	3.5	4	3.5	3.75
19. Soon after using Superhero Social Skills, parents would notice a positive change in social skills	4	4.5	5	4	4.375
20. The child's behavior will remain at an improved level even after Superhero Social Skills is discontinued	4.5	5.5	4	4.5	4.625
21. Using Superhero Social Skills should not only improve the child's behavior in the home/classroom, but also in other settings	5	4	4	4	4.25

Table 6 Continued

Item	Didactic parent mean	Didactic teacher mean	Video parent score	Video teacher mean	Total mean
22. When comparing a participant with a non-participating peer before and after use of Superhero Social Skills, the participant's and the peer's behavior would be more alike after using Superhero Social Skills	3.5	4	4	4	3.875
23. Superhero Social Skills should produce enough improvement in social skills so the behavior is no longer a problem	4.5	3	3	3	3.375
24. Other behaviors related to social skills also are likely to be improved by Superhero Social Skills	4	3.5	4	4	3.875

poor social skills in my child are severe enough to warrant use of Superhero Social Skills; when comparing a participant with a nonparticipant peer before and after use of Superhero Social Skills, the participant's and the peer's behavior would be more alike after using Superhero Social Skills; and Superhero Social Skills should produce enough improvement in social skills so the behavior is no longer a problem. Similar to teachers, parents' primary concerns centered on the ability of Superhero Social Skills to improve social skills to a point that children with ASD were indistinguishable from typical peers.

Items that received the most positive ratings from parents were the following: I would suggest the use of Superhero Social Skills to other parents; I would be willing to use Superhero Social Skills in my home; Superhero Social Skills is a fair way to teach social skills; I like the procedures used in Superhero Social Skills; and Superhero Social Skills is a good way to handle social skills at home. Items that received the most positive ratings from teachers were the following: poor social skills in my student are severe enough to warrant use of Superhero Social Skills; I would be willing to use Superhero Social Skills in my classroom; Superhero Social Skills is consistent with other social skills programs I have used; Superhero Social Skills is a fair way to teach social skills; Superhero Social Skills is reasonable for difficulties that arise from social skills; I like the procedures used in Superhero Social Skills; and Superhero Social Skills would produce a lasting improvement in a child's behavior. Overall, parents and teachers evaluated Superhero Social Skills as being highly acceptable, and presenting social skills in a manner that is effective and fair. Most importantly, Superhero Social Skills was evaluated as having the ability to produce lasting changes in social skills. The data from this study are sufficient to satisfy the research question.

### Research Question 10

*What is the participant satisfaction of Superhero Social Skills for Children with Autism, as measured by the Child Consumer Satisfaction Survey?*

Additional social validity data were collected from the intervention participants. Intervention participants from the didactic and verbal groups were verbally administered items from the Child Consumer Satisfaction Survey (CCSS). Responses were converted to numerical scores, following the same metric as the Parent Social Validity form. Overall, the Superhero Social Skills was perceived as being very favorable. On average, participants in the didactic group strongly agreed with all statements ( $M=4$ ), indicating high satisfaction with the program. The CCSS was only administered to Participant 1, as Participant 2 had withdrawn from the school prior to conclusion of the intervention. It was also found that Participant 1 strongly agreed with all CCSS statements ( $M=4$ ), again suggesting high treatment satisfaction. The data gathered in this study is sufficient to satisfy the research question.

### Research Question 11

*What is the social validity according to parents, as measured by a scale adapted from Bellini's social validity scale?*

An additional social validity checklist, adapted from Bellini, was administered to parents of intervention participants upon conclusion of the program. Parents were asked to endorse "Strongly Disagree," "Disagree," "Agree," or "Strongly Agree" in response to five items. Responses were coded into numerical values (Strongly Disagree=1, Disagree=2, Agree=3, Strongly Agree=4), with item 1 being reverse scored. Overall,



parents of the didactic intervention participants rated the didactic version of Superhero Social Skills as not interfering with normal class activities ( $M=3$ ), beneficial to their children ( $M=3.5$ ), and easy to implement ( $M=3.5$ ), as well as rating their children as enjoying watching the peer videos ( $M=4$ ) and enjoying the overall program ( $M=3.5$ ). Due to Participant 2's withdrawal from the school housing the Superhero Social Skills program, social validity data is only available from the parent of one video-based participant. The video-based intervention was rated as not interfering with normal classroom activities (4), easy to implement (4), and beneficial to their child (4). Their child was also rated as enjoying watching the Superhero Social Skills videos (4) and enjoying their participation in the intervention (4). The data obtained in this study is sufficient to satisfy the research question.

### Reliability

The filmed free time periods serve as a means to measure interrater reliability. Twenty percent of the filmed free time sessions were observed and coded by trained research assistants and compared to the researcher's social interaction coding of the same video session. The reliability check ensures that judgments of social interaction remain accurate measures of the participant's actual social interaction. Reliability was calculated by dividing the number of agreements by the number of agreements and disagreements. Overall reliability was calculated to be 89.54%.

Kappa was calculated to determine reliability. Kappa is especially useful in determining interobserver reliability because it determines both occurrences and nonoccurrence of behaviors (Sattler, 2006). Kappa is used to determine the proportion of

observer agreements, while also correcting for chance agreements. The current study used the formula presented by Uebersax (1982) for calculating kappa. For the current study, kappa was found to be 0.79. According to Landis and Koch (1977), a kappa of 0.79 can be determined to have substantial strength of agreement. For these reasons, it is determined that the codings used in this study are reliable and interpretable.

## CHAPTER 4

### DISCUSSION

The current study evaluated the efficacy of the Superhero Social Skills program in increasing social engagement of preschool-age children with ASD. Four children with ASD were recruited from a specialized school for participation in the study. Participants were required to meet inclusion criteria and diagnosis of ASD was confirmed through administration of an ADOS prior to inclusion in the study. After meeting inclusion criteria, 4 participants with ASD were randomly selected for inclusion in the study. Participants with ASD were then randomly assigned to one of two treatment groups. Participants 1 and 2 were assigned to the video-based Superhero Social Skills group. Participants 3 and 4 were assigned to the didactic social skills group. Additionally, 4 typically developing peers were recruited for inclusion in the study from an on-site preschool used for integration purposes. The 4 typically developing peers were randomly assigned to the treatment groups. Individuals assigned to the didactic group received identical information as the video-based group, with the only difference being in the method of instructional delivery.

Once assigned to groups, observations of social engagement were made during three 10-minute analog play periods. Each analog play period was filmed, and social

initiations and responses were coded in 10-second intervals for all participants with ASD. Prior to beginning treatment, social skill checklists were completed by parents and teachers of participants with ASD. These checklists allowed for comparison between preintervention and postintervention parent and teacher appraisal of social skills. Once baseline observations of social engagement were completed, both treatment groups began social skills instruction. Social skills groups were held twice weekly for a total of 8 weeks. At the conclusion of each social skills lesson, participants were placed in a 10-minute analog play period. As with baseline, these analog play sessions were videoed and social interactions and responses were coded for all participants with ASD. Upon conclusion of the study, social skills checklists were again completed by parents and teachers of participants with ASD.

Overall, it was found that the video-based social skills program on average produced a large effect size ( $ES=.93$ ) for total engagement. Effect sizes for social initiations and responses were small ( $ES=.29$ ) and large ( $ES=.99$ ), respectively. Likewise, the didactic social skills group was found to produce a large effect size ( $ES=1.54$ ) for total social engagement, with medium ( $ES=.46$ ) and large ( $ES=1.48$ ) effect sizes found for social initiations and social responses, respectively. However, as previously discussed, the effect sizes for the didactic group are the result of extreme improvements in social engagement of only 1 participant. Overall, it appears that both the video-based and didactic group was effective in increasing social engagement of participants. Parent observations also suggested that the video-based and didactic Superhero Social Skills groups were effective in reducing social impairments. Checklists

completed by parents and teachers suggest that both the video-based intervention and the didactic intervention were socially valid.

Overall, the findings of the current study contribute to current research in that they offer support for the use of a multimedia social skills program for children with ASD. The current study demonstrates that a social skills curriculum delivered by animated characters is effective in increasing social engagement in children with ASD. While many studies have attempted to evaluate the efficacy of single interventions for increasing social engagement, the current study demonstrated that several interventions can be successfully combined into a single social skills package. Equally important, it was found that the Superhero Social Skills program is socially valid, receiving high ratings from parents and teachers. It was also demonstrated that the Superhero Social Skills package can be delivered with 100% treatment fidelity, due to its reliance on video-presented social skills lessons instead of facilitator-based social skills lessons. These findings are particularly important given the negative outcomes associated with poor social skills in individuals with ASD.

The hypothesis of the current study—that participants in the video-based group would make greater improvements in social engagement than participants in the didactic group—was found to be false. While large effect sizes in total engagement were observed for both participants in the video-based group, 1 participant in the didactic group demonstrated greater gains. This suggests that other components included in the Superhero Social Skills program are capable of producing large effects in social engagement. However, it was observed that both participants assigned to the video-based group experienced large effects, while only 1 participant in the didactic group

experienced such effects—with the other participant demonstrating no intervention effects.

Unlike the findings of Bellini and Akullian's (2007) meta-analysis, which found that most social skills programs for children with ASD produced only questionable intervention effects, the current study found that the Superhero Social Skills program, when presented didactically or in its video-based format, produced large effect sizes in total social engagement. This increase in social engagement reflects improved social initiations and responses. Bellini and Akullian also reported in their meta-analysis that social skills programs decrease in effectiveness when instruction is delivered outside the child's natural environment. Although the current study evaluated a social skills program taught outside of the participant's classroom, overall effect sizes were still observed to be large. However, other research in social skills training for children with ASD reveals that many of the components included in Superhero Social Skills have been found to be effective in increasing social engagement of individuals with ASD—effectively differentiating Superhero Social Skills from many of the social skills programs included in the meta-analysis of Bellini et al. (2007).

Improvements in social engagement observed in both treatment groups in this study can be explained by past social skills research. In their meta-analysis, Bellini and Akullian (2007) found that video-modeling not only produced moderate intervention effects (PND=80%), but found video-modeling interventions to be effective in maintaining and generalizing learned social skills (PND=83%, PND=74%, respectively). While the PNDs calculated in the current study demonstrate more variability than found by Bellini and Akullian, the meta-analytic findings support the effect sizes calculated in

the current study. The classification of video-modeling as an Established Treatment by the NAC also aids in explaining the results of this study. The NAC review of 50 studies (National Autism Center, 2009) using live and video modeling found that modeling was effective in increasing important skills related to social ability. Communication, play, and interpersonal skills were all increased as a result of the studies evaluated by the NAC.

Additional support for the use of video modeling in preschool-age children has been found (Bellini et al., 2007). Similar to the results of the current study, a video-modeling intervention was found to substantially improve social initiations of intervention participants. Although participants in both the video-based and didactic Superhero Social Skills groups were exposed to video-models of social skills, not all participants improved as expected. In the researcher's opinion, differences in social skill improvements may be due to a lack of necessary exposure to the video-models. Participant 4, who demonstrated little change in social engagement during treatment, frequently reported that he had not watched the assigned peer model videos at home. Therefore, it may be necessary that video models be observed more frequently, such as once per day as done by Bellini et al. Overall, research suggests that the inclusion of video modeling in the Superhero Social Skills program would result in increases in social engagement.

The use of peer-mediated instruction is also likely to have contributed to the effects observed in the current study. Effects sizes found in the current study ranged from .00 to 3.09, with a mean of 1.24 for all participants. This mean is similar to the effect sizes found in Zhang's (2008) meta-analysis of peer-mediated social skill interventions, which found an overall effect size of 1.46. Peer modeling, the peer-

mediated intervention incorporated in both treatment groups evaluated in the current study, was found to be the most effective type of peer-mediated social skills intervention. These findings, in conjunction with findings of Miller's (2006) meta-analysis, aid in explaining the treatment effects observed in both groups.

Miller's meta-analysis also found that peer-mediated interventions produced large effect sizes ( $ES=3.27$ ) for children with ASD. One significant finding in Miller's meta-analysis was that as children age, peer-mediated interventions become more effective in improving social skills. For younger children, it was found that collateral skill interventions were more useful for younger children. Because only preschool-age children participated in the current study, the peer-mediated component of the Superhero Social Skills intervention may not have been as effective compared to peer-mediated intervention with school-age children. Miller's finding of a correlation between participant age and efficacy of peer-mediated interventions is useful in explaining why effect sizes found in the current study are somewhat lower than for other peer-mediated interventions evaluated in the meta-analysis. Instead, the findings of the current study are more closely in line with Zhang's (2008) findings on social skills programs that combine several types of peer-mediated interventions—programs that were determined to have an effect size of 1.89. Overall, it is expected that the peer-mediated component of Superhero Social Skills was beneficial in increasing social engagement of preschool children with ASD.

The effect sizes observed in both treatment groups can also be explained by the inclusion of Direct Instruction techniques incorporated in the program. Research on the Direct Instruction model has found large effect sizes (Adams & Englemann, 1996;



Forness et al., 1997), as were found for the majority of participants included in the current study. Skill sequencing, a principle central in the Direct Instruction model, also plays a fundamental role in the Superhero Social Skills program. For example, the Get Ready skill is the first skill taught in the Superhero Social Skills program. Although it is not a social skill, Get Ready teaches children to pay appropriate attention to the group facilitator—developing instructional control and allowing for maximum participant benefit through enhanced engagement in the social skills group. The skill sequencing aspects of Direct Instruction are continued in subsequent lessons of Superhero Social Skills, with skills being presented in a calculated sequence of basic to advanced skills.

The findings of the current study also support the use of the modeling, guided practice, and independent practice method of Direct Instruction. Participants in Superhero Social Skills and other Direct Instruction interventions are first shown models of the target behavior, and then allowed to practice the behavior in a controlled environment where prompts are provided. During the Superhero Social Skills group, participants with ASD are allowed to practice the social skills with a typical peer during role-play situations and during social games. Lastly, participants are encouraged to practice the skill independently outside the social skills group, with monitoring and feedback from parents and teachers. Just as the components of the Direct Instruction model were found to form an effective instructional strategy for students in special education (White, 1988), the same components of Direct Instruction incorporated in the Superhero Social Skills program are considered to contribute to the large effect sizes observed in social engagement during the current study.

The positive effects of Superhero Social Skills can also be attributed to the inclusion of social stories in the curriculum. The inclusion of participants with a minimum verbal IQ score of 70 on a standardized measure conforms to the findings of Quirnbach et al. (2009) that basic verbal skills (i.e., WISC verbal IQ score above 68) are requisite for social stories to be effective. The social skill improvements observed in 3 of 4 participants can, in part, be attributed to participants having sufficient verbal skills as to benefit from social stories. The current study using the Superhero Social Skills curriculum also sought to overcome previous shortcomings of social story-only interventions, such as lack of maintenance of learned skills (Sansoti et al., 2004), by incorporating additional components.

Additional practices found to be effective in increasing social interaction in children with ASD were included in the Superhero Social Skills program. While Lee et al. (2007) found that self-management was successful in increasing rates of appropriate behavior, the author of the current study believes self-management contributed less to the outcomes than other components due to limited inclusion of the component in the program. Self-management took place at the end of each treatment session, during which participants transferred Power Charges earned during the treatment session and at home to the Power Poster. Perhaps if participants had been responsible for monitoring their use of learned skills and giving themselves Power Charges, instead of assigning adults to these tasks, the program could have benefitted more from the inclusion of the self-monitoring component—resulting in effects similar to those observed in the meta-analysis of Lee et al.

Effects observed in the current study also demonstrate the utility of high-interest media in social skills programming. Participant's verbal reports indicated that they enjoyed reading the comic books and watching the peer model videos. Participants in the video-based group indicated that they enjoyed the animated superheroes that presented and taught the social skills. High interest media played the important role of engaging the participants and encouraging higher levels of attention, thereby increasing the amount learned during each social skills lesson.

Although 1 participant in the didactic Superhero Social Skills group failed to show improvement in social engagement, improvement was observed in 1 subject in the didactic group. This finding further suggests that the previously discussed components of Superhero Social Skills are responsible for gains in social engagement observed in this study. Because participants in both treatment groups were exposed to video models of children successfully performing the taught skills, peer-mediated instruction, and effective instructional procedures, it is expected that both treatment groups would benefit from the models. The failure of 1 participant to demonstrate any improvements in social engagement may be due to differences in use of intervention materials and procedures outside the intervention setting, discussed further in the limitations section.

#### Limitations and Future Research

The current study evaluated the effects of the Superhero Social Skills program, comparing the efficacy of a video-based method of presentation with a didactic form of instruction. The primary outcome measure of the study, the Bellini observation system, may have provided an underestimate of actual social responses during the analog play

sessions. While the observation system used provided the opportunity to record actual responses, opportunities to respond were not considered. That is, a participant's opportunities to respond to peers varied during each analog play session—with some sessions providing more opportunities to respond and increase the percentage of time engaged in social response. However, some analog play sessions may not have offered as many opportunities to respond to peers, thereby decreasing the participant's percentage of engagement in social responses although no such decrease actually existed.

Differences in home utilization of the social skills program also proved to be an uncontrolled variable. It was the author's observation that during check-in, Participant 4 often reported that he had not watched the DVD at home, nor read the social story comic book. Additionally, Participant 4's use of the Power Card system—in which demonstration of the current social skill is reinforced outside the social skills group—waned with time. Initially, Participant 4 returned Power Cards with a large number of Power Charges completed. Towards the end of the program, Power Cards were more often incomplete. Such variation in utilization of the Power Cards was not observed in other participants. It was also observed that Participant 3 had more parent utilization of the social skills program. For these reasons, lack of control of home utilization variables proved to be a limitation of the study.

Another limitation of the study was the lack of a multiple baseline design. Multiple baseline designs allow the researcher to better determine if intervention is responsible for observed changes due to greater control of threats to internal validity. Due to the use of treatment groups in the current study, a multiple baseline design across participants was not possible. Threats to internal validity in AB designs stem from a lack

of control of external variables, such as maturation, previous exposure to social skills instruction, and other confounding variables. While the current study extended over several weeks, it is not expected that maturational effects greatly contributed to the effects observed in the current study. The current study did not account for other confounding variables, such as previous exposure to social skills training and parental implementation of the current social skills curriculum. However, due to the current study meeting the criteria of Kazdin (1982) –using multiple assessments, a stable target behavior, heterogeneous group of participants, and producing an immediate and marked effect—and Kratochwill (1992) –using a planned study with a high level of treatment integrity, delivering a standardized treatment, and producing a large effect size— for valid AB design, it is expected that the results of the current study are valid.

The current study is also limited by the attrition of Participant 2 in the video-based group. While Participant 2 did demonstrate improvements in social engagement attributed to the introduction of the *Superhero Social Skills* intervention, follow-up data—such as parent completed SRS and ASSP—are not available. The attrition of Participant 2 limits the study’s ability to compare the two treatment groups. However, due to the improvements in social engagement observed in Participant 2 prior to leaving the study, one may conclude that the overall treatment was beneficial.

Lastly, the current study was unable to apply findings that social skill groups are best taught in the child’s natural environment (Bellini et al., 2007). While peers from the children’s classrooms were included, the social skills group took place in a separate classroom with a small number of children. Had social skills instruction occurred in the

children's natural setting, different effects may have been observed. The current study is also limited by lack of generalization and follow-up data.

Future research on social skill packages for children with ASD should address the aforementioned limitations. Of utmost importance is addressing parental use of the social skills package. Parental use of the social skills program is not only important for producing intervention effects, but also for increasing maintenance effects and generalization to other settings. Superhero Social Skills is designed to improve generalization and maintenance of learned skills through incorporation of components found to be useful in these areas. However, the success of these components hinges on parental follow-through and appropriate use of the social skills materials—such as DVDs and comic books. Future research should focus on parental training—teaching parents how to effectively use the Superhero Social Skills program in order to obtain maximum effect.

Future research should also focus on utilizing research findings on teaching social skills in the children's natural environment. Again, parent training can serve this purpose by providing reinforcement and training of social skills in the child's natural environment. Additional research may also focus on a school-wide implementation of the Superhero Social Skills program. Such research would provide important information about the treatment, generalization, and maintenance effects of the Superhero Social Skills program, while also providing information about the efficacy of school-wide social skills programs.

Important research considerations should also be taken for future research on the Superhero Social Skills program. As previously discussed, opportunities to respond may

have affected the outcome of the current research study. Future studies should evaluate social responses and opportunities to respond, providing a better evaluation of changes in said behavior. Future research should also evaluate generalization of effects to other settings, such as classroom and home behaviors. Follow-up studies should be conducted to evaluate the long-term efficacy of the Superhero Social Skills program.

### Implications for Practice

The findings of the current study provide support for the use of the Superhero Social Skills program for young children with ASD. The results suggest that the Superhero Social Skills program, whether presented via video or didactically, is effective in increasing social engagement in the target population. Superhero Social Skills was also found to be socially valid, based on parent and teacher ratings of the program. Superhero Social Skills provides an effective, economical, and easy to implement social skills program. Overall, results of this study suggest that the Superhero Social Skills program is an acceptable treatment option for addressing social skill deficits in children with ASD.

APPENDIX A

SOCIAL SKILLS PLACEMENT CHECKLIST





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***Motivation and Learning Style***

What is the child's typical motivational level? (Circle one)

Very motivated                      Somewhat motivated                      Not motivated

What are the child's favorite things or activities? \_\_\_\_\_

Is the child more of a visual learner or auditory learner? \_\_\_\_\_

***Attention Span and Persistence***

Describe the child's activity level (Circle one)

Extremely active                      Somewhat active                      Average                      Below average  
Lethargic

***Memory Abilities***

Describe your child's memory abilities (Circle one)

Excellent      Good                      Average      Fair  
                    Poor

***Anxiety and other Psychological Factors***

What causes the child to become upset? (Circle all that apply)

New situations                      New people      Changes in routine                      Frustrating  
activities

Can the child calm him/herself when upset or does he/she need help in doing so?

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What strategies have assisted the child in managing negative feeling states?

?? \_\_\_\_\_

***Other Relevant Factors***

Are there any other important factors or considerations we should know about your child?

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***Thanks for your help in completing this. The information is very useful!***

APPENDIX B

SOCIAL OBSERVATION CODES

## Bellini's Social Observation Codes

### **Social Engagement:**

Participation in activity or play sequence with peer involving shared toys, objects, and play items. Parallel play with separate play items is excluded from this code; however, an exchange of play items during the interval should be coded as social participation.

Examples include being pushed in a wagon, taking turns during a board game, playing jointly with paint, play dough, building blocks, brushes, cars, dolls, etc. Also, asking questions, or responding to questions, and engaging in conversations should be coded as participation. Any unprompted social response or initiation during an observation interval should be recorded as social engagement for that interval (see codes below).

### **Social Initiation**

- a. Request Assistance
- b. Request Information
- c. Request Interaction/Participation
- d. Joining-in Play Activity or Interaction
- e. Greeting/Compliment
- f. Giving/Sharing/Showing
- g. Offer Comfort/Physical Affection

Initiation: defined as the child beginning a new social sequence, distinguished from a continuation of a previous sequence by a change in partner, change in activity, or a discontinuation of the previous play sequence for at least 5 seconds.

- Requesting (non-verbal) using a sign or other nonverbal behavior (e.g., handing or bringing an object to other person to request an activity, interaction, or assistance (e.g., raise hand) with others
- Requesting (verbal) using questions or directives to obtain items or to get others to engage in actions or interactions, or to request assistance
- Play initiation--gets other person's attention by gesturing, holding up an object, tapping a child on the shoulder, asking other person to play, or calling his or her name, joining-in a play activity or interaction with other children (w/o being requested to do so)
- Asking social questions and requesting information. Questions that are not for the purpose of requesting objects or interactions. Asking questions about what is happening; what will happen next; how people feel; or who is doing what
- Comments. Talking about feelings or what is happening during the social situation.

- Giving/ sharing. Giving an object to other person or sharing an object with which the child is already playing.
- Praise/Compliment/Greeting. Statements of approval, affection, greeting, or admiration of other. Also include non-verbal gestures of greeting, such as waving “hello” or “goodbye.”
- Physical affection—Positive physical contact such as hugging, kissing, holding hands.
- Play organizer-- Verbally specifies an activity, suggests a play area, or directs other person to engage in any activity related play behavior; verbally or nonverbally offers or requests an object from the other person
- Comfort/Reassurance—Verbal or physical consolation when another person is in some way distressed

#### Social Responses

- a. Request for Assistance
  - b. Request for Information
  - c. Request for Interaction/Participation
  - d. Greeting/Compliment
  - e. Offer to Share to Object
  - f. Physical Affection
- Provides assistance to other person following a request
  - Verbally responds or responds non-verbally (e.g., nods head) to questions directed at him by others
  - Joins in activity following request or invitation
  - Verbally or non-verbally (gesture, such as a wave, or facial expression, such as a smile) responds to greeting or compliment from others
  - Accepts toy or object from other person when offered, by grabbing, looking, or holding object. Looks in the direction of an object when directed by other person to do so
  - Accepts physical affection (i.e., touch or hug) from other person without moving away from, or physically rebuking other person’s attempt at physical affection (e.g., pushing other person away, running away, etc.

APPENDIX C

CHILD CONSUMER SATISFACTION SURVEY

## Child Consumer Satisfaction Questionnaire

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Please indicate how you felt while participating in the Superhero Social Skills Program.  
Please circle the response that best describes how you felt.

**SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree**

1. Superhero Social Skills has interfered with my other classes

**SD D A SA**

2. Superhero Social Skills helped me learn how to make friends

**SD D A SA**

3. I liked watching the videos

**SD D A SA**

4. I liked reading the comic books

**SD D A SA**

5. I liked the Superhero Social Skills power cards

**SD D A SA**

6. I believe the Superhero Social Skills has helped me

**SD D A SA**

7. I enjoyed participating in Superhero Social Skills

**SD D A SA**

8. The things we talked about in the lessons are important

**SD D A SA**

9. I would like the Superheroes to teach me more

**SD D A SA**

Additional comments:

APPENDIX D

SOCIAL VALIDITY CHECKLIST



### Sample Social Validity and Treatment Fidelity Form

Teacher Name:

Student's Name:

Date:

**SD = Strongly Disagree D = Disagree A = Agree SA = Strongly Agree**

The intervention has interfered with my child's normal classroom activity

**SD            D            A            SA**

My child enjoys watching the video

**SD            D            A            SA**

The home component of the intervention is easy to implement

**SD            D            A            SA**

I believe the intervention is beneficial to my child

**SD            D            A            SA**

My child enjoyed being part of this intervention

**SD            D            A            SA**

Additional Comments:

APPENDIX E

PARENTAL PERMISSION DOCUMENT

## Parental Permission Document

### BACKGROUND

Your child is being asked to take part in a research study investigating the effectiveness of different methods of social skills instruction for children with Autism Spectrum Disorders (ASD) and their peers. Before you decide to allow your child to participate in this study, please read the following information carefully. The researcher is available to answer any questions or concerns that you may have prior to granting permission for your child to participate. Take time to decide whether you will allow your child to participate in this study.

Impairment in social interaction is one of the central traits of ASD. The current study is important due to the lack of positive results produced by social skills interventions currently available for children with ASD. Due to this lack of positive results, *Superhero Social Skills* was developed. *Superhero Social Skills* has been designed around practices that have proven most effective in increasing social interaction in past research studies, such as use of video demonstrations of social skills, inclusion of typically developing peers, and methods of tracking one's own progress. *Superhero Social Skills* is presented through a series of videos in which animated "superheroes" teach how to demonstrate a number of social skills. This study's purpose is to evaluate the efficacy of the video-based method of instruction used in *Superhero Social Skills*, as compared to a traditional instruction in which information is presented entirely through a group facilitator.

This research study is being conducted by Keith Radley, a Masters candidate at the University of Utah in Educational Psychology. All social skills lessons will be conducted at the Carmen B. Pingree School for Children with Autism during regular school hours.

### STUDY PROCEDURE

The procedures of this study vary depending if your child has been diagnosed with an Autism Spectrum Disorder. Both children with ASD and children without ASD are being asked to participate in this study. If your child has been diagnosed with ASD and you and your child agree to participate in this research, you will be asked to complete several rating scales and checklists. These scales and questionnaires will help us understand your child's current social abilities, and provide a confirmation of ASD diagnosis. These scales will take approximately 45 minutes to complete.

Parents of children who do not have ASD will not be asked to complete these surveys. While the focus of this study is to determine the efficacy of the *Superhero Social Skills* program in enhancing social interaction of children with Autism, your child will play an important role in this study. Past studies have shown social skills instruction for children with Autism to be more effective when typically developing peers are included in the social skills group. At the end of the program, parents of children without ASD will be asked to complete a short social skills group satisfaction survey.

If you allow your child to participate in this study, your child will participate in a social skills group—*Superhero Social Skills*—twice a week. The entire program will last for 18 weeks, or 36 sessions. Each session will last approximately 45 minutes. During each session, your child will be taught the steps to performing various social skills, such as

following directions and how to deal with bullies. All the lessons in *Superhero Social Skills* follow a general format of: receiving instruction on a skill, watching a video of children demonstrating the skill, practicing the skill, and playing a social skill related game. During instructional time, children will have the opportunity to earn rewards for following group rules. Your child will be provided with a homework assignment at the end of each lesson. Homework assignments typically consist of viewing a 2-3 minute video and reading a social skills comic book.

Upon completion of the *Superhero Social Skills* program, parents of children with ASD will be asked to complete another series of checklists and surveys evaluating your child's social abilities. These checklists and surveys are relatively simple and short, and will assist in empirical evaluation of the *Superhero Social Skills* program.

Although the *Superhero Social Skills* program is experimental, a number of the most effective methods of social skills instruction have been included. It is believed that *Superhero Social Skills* will be beneficial in the acquisition and demonstration of socially appropriate behaviors.

### **RISKS**

The risks of this study are minimal. Your child may not enjoy participating in social skills lessons, and may become distressed when placed in a situation where they talk about and practice social skills. However, these risks are similar to those experienced on a daily basis your child's regular environment. Participation in this study involves no more risk than your child encounters in their typical educational setting.

### **BENEFITS**

Due to the experimental nature of this study, no benefits can be promised for participating in this study. However, due to the inclusion of a number of evidence-based practices in *Superhero Social Skills*, potential benefits:

- Children with and without ASD may acquire new socially appropriate behaviors and skills
- Children with and without ASD may meet new friends
- Children with and without ASD may learn how to be a better friend
- Children with and without ASD may improve the way that they feel about themselves.
- A benefit to society to help determine social skills interventions that are helpful for children with ASD.

### **ALTERNATIVE PROCEDURES**

If you do not want your child to take part in this study, your child will remain in their regularly scheduled activities. You may contact the researcher of the Pingree School for additional social skill resources. There is no negative consequence of not participating in this study.

### **CONFIDENTIALITY**

Your child's personal information will be strictly confidential. Data obtained from your child through checklists, surveys, questionnaires, and observations will be kept in a locked filing cabinet. Any electronic data will be stored on Mr. Radley's password protected personal computer. Access to this data will be restricted to Mr. Radley and his research assistants. All personal information will be removed from any data shared with other professionals.

The results of this study may be published in a professional journal and/or presented at professional conferences. Should this occur, no personally identifiable information will be given; only the age and gender of participants will be given.

### **PERSON TO CONTACT**

If you feel that your child has been harmed as a result of participation, or if you have any questions, complaints or concerns related to this study please contact Mr. Radley by phone, or by email:

Keith Radley  
(801)860-6894  
que\_rad@hotmail.com

### **INSTITUTIONAL REVIEW BOARD**

Contact the Institutional Review Board (IRB) if you have questions regarding your child's rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at [irb@hsc.utah.edu](mailto:irb@hsc.utah.edu).

### **VOLUNTARY PARTICIPATION**

Participation in this study is voluntary. Refusal to allow your child to participate in this study, or the decision to withdraw from this study will not result in a penalty or loss of benefits to which your child is entitled. You may choose to withdraw your child's participation from the study at any time.

### **COSTS AND COMPENSATION TO PARTICIPANTS**

There is no cost to participate in this study. All materials necessary for participation will be provided by the researcher. Upon completion of the study, participants are free to retain all materials provided to them by the researcher.

Participants of this study may receive rewards for good behavior during social skill lessons. Some possible examples of rewards are food treats, stickers, and small toys. Any reward that you or your child is not comfortable with will not be used.

### **CONSENT**

By signing this consent form, I confirm I have read the information in this parental permission form and have had the opportunity to ask questions concerning the study. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to participate in this study.

\_\_\_\_\_  
Child's Name

\_\_\_\_\_  
Parent/Guardian's Name

\_\_\_\_\_

Parent/Guardian's Signature  
Date

\_\_\_\_\_  
Relationship to Child

\_\_\_\_\_  
Name of Researcher or Staff

\_\_\_\_\_  
Signature of Researcher or Staff  
Date

## APPENDIX F

### DETAILED PROGRAM DESCRIPTION

## **Introduction to the Program**

*Superhero Social Skills* is an eighteen-lesson social skills program that is run over eighteen or thirty-six weeks. It is designed to be taught in a small group format for children with high-functioning autism spectrum disorders (ASDs). The program is designed to appeal to non-disabled children as well. The ideal group composition would include some children with high-functioning ASDs and some non-disabled children who already have adequate social skills.

Although the title of the program sounds more like a fun video game, the program is an evidence-based approach to teaching social skills. This program combines highly engaging materials and activities with research-proven methods for teaching critical social skills to children with ASDs. The idea is to capture the children's attention, motivate them to participate, teach them important skills, and make the whole process fun.

Each of the eighteen skills is presented in two lessons given preferably over a one week period of time. Each lesson has the same format, rules, and motivation system. Each set of lessons varies in the type and steps of the different social skills being taught. The essential outline of each lesson includes:

- Checking In (Recording Skill Practice From Previous Week)
- Reviewing of the Posted Daily Schedule and Posted Group Rules
- Introducing the Social Skill and Watching the Superheroes Define the Skills  
and the Steps to the Skill on DVD
- Watching Peers Performing the Skill On the same DVD
- Role-playing the Skill with a Peer



- Watching the Superhero Social Story Comic Book on DVD
- Engaging in a Social Game Based on the Skill
- Free Time and/or Snack
- Marking the Superhero Power Poster with Power Charges Earned
- Group Reinforcement-Superhero of the Day
- Explaining and Giving Homework (also putting finished Comic Books and Power Posters in each child's Superhero Folder)
- Goodbyes

During the lesson, the motivation program is implemented by giving Scooter Cards for appropriate behaviors (following the Group Rules) and Black Hole Cards for inappropriate behaviors (see Technique Tips for Scooter/Black Hole Cards). The second part of the lesson later in the week differs by going over the Homework during Check-in and publicly posting skill practice by marking the Power Charges earned since last lesson to the Power Posters. In the second sessions, more free time for games is allowed. Each of these features of the second sessions is designed to promote generalization of skills learned in the first session.

***Technique Tips:  
Scooter Cards/Black Hole Cards Reinforcement***

- Laminate cards for re-use each week.*
- Write a child's name on the back of a Scooter Card when it is earned.*
- Use water-based marker so names can be wiped off and cards re-used next time.*
- Do NOT put children's names on Black Hole Cards.*

*--Accumulate earned cards (both kinds) in a see-through container as they are earned during the session so children have a visual reminder of their chances for reinforcement (more Scooter Cards – better odds).*

*--When reinforcement time comes, draw one card to see who will be the Superhero of the Day (keep drawing until a Scooter Card is drawn with a name on it).*

*--Have the Superhero of the Day draw the next card. If a Scooter Card is drawn, the child can spin the spinner to determine which reinforcer will be given.*

*--If a Black Hole Card is drawn, no reinforcer for that day—better luck next time!*

**Starting the Lesson: Checking In** (Materials-Name Tags, Checking Homework and Power Charges earned)

You may either have the children arrive independently or you may have to go and get them from their classrooms or waiting area, depending on the group level of functioning. Before the children arrive, put name tags around a large table or on chairs so they have the structure of knowing where to sit. As a lot of children with ASDs have difficulty with transition, this will assist in making the transition easier. When the children arrive, direct them to the spot next to their name tags if needed. It can help to have a digital photograph of the child on their name tag. Instruct each child put on their name tag (you may have to do this for some children) and say their name (or you say their name). Reinforce each child with a Scooter Card as they complete this process.

As the lessons progress through the program, check-in time is used to record skill practice during the week as recorded on the Power Card by parents and teachers. The facilitator marks the Power Poster with all the new power charges shown on the Power Card and puts the Power Poster up in the room. As this transfer is happening, the

facilitator can ask the child, “How did it go?” and gather information that can be used later to develop scenarios for role-playing.

***Technique Tips:***

***Lanyards***

*--In some school districts, break-away lanyards are required. Be sure to check your local rules.*

*--When the child puts on his or her lanyard, this becomes their signal to get ready and transition into the group. Don't give the child his lanyard until he is seated and ready.*

*--Keep lanyards in the room. Although the Power Cards can go home, the lanyards should stay.*

*--Vinyl badge holders protect the Power Cards from excess wear during the week. You may need to have extras on hand, however as they may not return as planned.*

**Review of the Daily Schedule and Group Rules**

To get the session started, point out the visual Daily Schedule and Group Rules. The Rules should be posted on the wall, bulletin board, or white board within the children's eye sight. For younger children, the schedule and rules may need to be in pictures rather than words. The four rules of the group are:

*Get Ready*

*Follow Directions*

*Be Cool*

*Participate*

It should be noted that the four rules are also the skills of the first four lessons of the social skills program.

Make sure to initially explain each rule separately and what it means in concrete terms (for example, “Get Ready” means you are sitting in your chair, your eyes are on me, your hands and mouth are quiet.”) Provide examples and non-examples, as well as a rationale as to why the rules are important. It is important that only the Group Leader or facilitator (no children) act out the non-examples of rule violations. Most children with an ASD find this very amusing. You can ask the children to tell you what you did wrong and how you could have followed the rule in a more appropriate way.

Next, you will need to explain to the children that they will be earning Scooter Cards when they follow the rules during group time. Black hole cards are given out for each violation of a group rule. Start shaping the children to follow the rules immediately. For instance, if a child is paying attention while you are describing the rules, you could say the following: “I like how (child’s name) is looking at me while I’m talking. That tells me that he is participating in what we are doing and makes me feel good. He earns a Scooter Card for following the rules.”

For a child who is violating the rules, you could say, “(Child’s name) is talking to his neighbor. That tells me he is not participating and I will have to put a Black Hole card in the container. Let’s hope he does better at following the rules.”

For the first session, use Black Hole Cards very sparingly because the children are still learning the rules. For the Introduction lesson, it might be most effective if you give yourself a Black Hole card when you don’t follow the rules. The non-example scenarios are perfect for this. Reinforce positive behavior in at least a 4:1 ratio to inappropriate behavior. Remember to be consistent and provide specific feedback on what the child is doing right or wrong. The Scooter and Black Hole Cards will be used

to reinforce the group at the end of the day. Explain to the group more Scooter Cards in the container means a better chance for a prize at the end of the session.

***Technique Tip:  
Keeping it Positive***

*To reduce the number of Black Hole cards given out in the group, first use Proximity Praise. For example, instead of pointing out the child that is breaking the rule, find a child that is close (proximity) and socially reward him for following rules. If the offending child then starts to behave, socially reinforce her also.*

Reviewing the Daily Schedule and pointing to the posted pictures helps with transitions for the ASD child. If you have access to a digital camera and the group progresses, you can take pictures of the various children in the group doing the scheduled activity and post them on the wall. Even as the group becomes accustomed to the schedule, they still may want you to go over it briefly each week so they know what to expect. As the group meets in subsequent weeks, you can fade out the repetition of the rules unless someone violates a rule and needs a reminder.

**Introduction of the New Social Skill and Watching the Superhero DVD**

Pass out the small Power Cards to each child (put on their lanyard) and post the corresponding Power Posters on the wall or nearby bulletin or white board with each child's name on it. Explain to the children that they will have the chance to gain power by following the steps to the targeted skill during each lesson. The Group Leader (the Leader could have his or her own Power Poster on the wall and Power Card on a lanyard) could model the social skills and mark a Power Card to show the children the process. Make a big deal about how the kids will compete with each other on how powerful they become over the course of the session. Emphasize that earning more

Power Charges means they have more powerful Superhero Social Skills. Prompt the children to look up at the video screen. This is also a good time to pass out some Scooter Cards for children who are attending and watching the video screen.

By watching the animation video, the children will be introduced to one of the main characters (i.e. The Initiator, Interactor Girl, and/or Scooter the Robot) of the program. The Superhero will name the skill and give the rationale why the skill is important. They will also learn the specific steps for the social skill through stick figures that are drawn. Again, remember to pass out Scooter Cards to children who are following the group rules to encourage the children to pay attention to the video screen and not disrupt others.

### **Watching Peers Performing the Skill On DVD**

After the Superhero has introduced the skill and the skill's steps have been demonstrated by watching the stick figure animation, the Superhero will return and invite the children in the group to "Watch some kids do it." This provides a transition in watching actual children demonstrating the skill through the use of peer video-modeling. Again, remember to provide reinforcement to children who are watching the video, either through verbal praise or through the distribution of Scooter Cards for compliance.

### **Role-playing the Skill with a Peer**

At the end of the video, the superhero will say, "Now let's see you do it!" Having the children participate in role-playing the steps to following directions, as well as putting all the steps together will help promote the generalization of these skills to other settings. Initially, the Group Leader should model each of the steps, including some non-examples. Next, the Leader should have each child in the group role-play each

step to the skill, providing a Power Charge on their Power Card for successful attempts. If the child does not perform the step correctly, an error correction process should occur instantaneously so the child learns the correct way to perform the step. After the children have successfully learned each step, you can divide them into pairs to practice putting all the steps together. The children can pick role-plays from the Scenario Cards at the end of each lesson or come up with their own scenarios.

***Technique Tip:***

***Self-as-a Model Video***

*If time and technology permit, you can video-record the children while they perform their role-plays. Make sure to follow confidentiality guidelines--obtain signed consent to video-record and permission to distribute copies to children in the group or make sure you only tape one child at a time and distribute copies only to that child.*

*If you video-record a child, make sure you keep only the correct demonstrations of the skill. Edit out errors or mistakes the child makes. These videos can then be used in the next session instead of replaying the video of peers demonstrating the skill. This approach is called "self-as-a-model" and has been shown to be very effective in teaching new skills.*

**Watching the Superhero Social Story Comic Book on DVD**

After the role-plays, guide attention back to the video screen and play the Social Story Comic Book for the skill you are trying to teach. As the Social Story Comic Book plays, point out the problem the Superheroes are having (i.e., type of problem, where they are, who else is there). When the blank bubbles appear, ask the children in the group what should happen.

You may have to pause the video, as it will provide answers after the blank bubbles are presented. Solicit as many comments as possible. Tell the children they will need to work on the Social Story Comic Book solution with their parents at home and they can earn Power Charges for writing good solutions in the blank bubbles in their own Social Story Comic Book as homework. Review the solutions during the Review time at the beginning of the next group meeting.

The Social Story Comic Book time is a good time to serve snacks to the group while they are at the table. Remember to reinforce the children with Scooter Cards for appropriate behavior and use this time as an incidental learning opportunity to give Power Charges to their Power Cards as well.

In the second session for the social skill, review the solutions for the Social Story Comic Book the children brought back as homework from their parents at the beginning of the group.

### **Engaging in Social Game Based on the Skill**

The first part of each lesson set includes a special group game that is based on the social skills you are teaching. For example, a variation of Simon Says is the game for the Following Directions skill and Play Turtle is the game for lesson on reducing anxiety. The group game is a prime time to catch students demonstrating the skill you are trying to teach. These are *incidental learning* opportunities and you have to be vigilant in catching children doing the skill. It helps if you say “I caught \_\_\_\_\_ doing the skill of the day. I’m going to mark her Superhero Power Card.” The group game should be fun and a way of giving lots of opportunities for the children to practice the social skill while playing.



Make sure you do not always catch the same child doing the skill. You might have to stretch it, but make sure all the children get caught at some time doing the skill. In the second session of each lesson set, time is allowed for small group (2-3 people) games and toys. (See the section on Free Time for game and toy suggestions.)

### **Free Time and/or Snack**

Provide several games and/or toys for the group members to play with during free time. Age-appropriate games are especially useful for practicing social skills. Shortened versions of games may be necessary to fit within the time frame. Again, when the children are demonstrating social skills during play, you can mark Power Charges on their Power Cards give them or Scooter Cards or provide error correction when necessary.

#### ***Technique Tip:***

#### ***Games and Toys***

*It helps to have toys or games that require at least two students to participate such as tic-tac-toe, checkers, ping pong, catch with a ball or Frisbee, gestures like charades, team tag, Jenga®️, Sorry®️, Uno®️, Go Fish, etc.*

Snacks can also be served during the Free Time period if they were not served during the Social Story Comic Book time.

#### ***Technique Tip:***

#### ***Helpers***

*Have two or more students help you with the snacks and reinforce them with Scooter Cards for helping.*

### **Marking the Power Poster with Power Charges Earned on the Power Card**

When free time is finished, it is time to mark all the Power Charges earned during the session on the Power Posters posted in the classroom. It helps if you give the water based pen to the student and have them self-record the number of Power Charges they earned from their Power Cards as they participated in the role-play and in free time.

Tell the children that if their parents or teachers “catch” them doing the skill during the week they can get more Power Charges by having the parent or teacher mark their card. Show them the place on the back where a parent and teacher need to sign each week to verify that only the adults marked the cards. This is meant to discourage children from filling up their own Power Cards without demonstrating the skills. The more Power Charges earned, the more Superhero Social Skill power they will have. Power Posters can be updated at this time in the session and during check-in of the next session. Public posting of the “powers” earned is an incentive to practice outside the group.

***Technique Tip:***

***Modeling***

*If you have your own Superhero Power Card and Poster, it helps to mark it and then show how another student has more Power Charges marked and you are going to try and catch up with them by practicing your skills and doing your homework this week!.*

**Group Reinforcement-Superhero of the Day**

In order to motivate the group to put their games or toys away and get ready to leave the session, save reinforcement for the last activity of the session. Make a big deal about Reinforcer Time and who might be the Superhero of the Day. The idea is

to generate excitement. This incentive will help with transition from the group back to the classroom or home.

All of the Scooter Cards (with student's names on the back) and Black Hole Cards earned during the session should be in a container already. It is important that the children not be able to see which ticket they are choosing, so block the view or raise the container where they can't see it for the drawing. The first card drawn will be for the Superhero of the Day. If a Scooter Card is drawn, the person's name on the back of the card is the Superhero of the Day. If a Black Hole card is drawn, keep going until a Scooter Card is drawn and a Superhero of the day is chosen.

The second card drawn will determine if the group gets a reinforcer or not. The Superhero of the Day draws a card from the container. If it is a Scooter Card, then the Superhero of the Day gets to spin the reinforcement spinner for the group. If it is a Black Hole card, no reinforcer for the group—better luck next time.

***Technique Tip:***

***Reinforcement Spinner***

*--When you create or buy your spinner, mark the areas unevenly.*

*Large areas (high probability) can contain smaller or less valuable prizes, treats, or privileges. Smaller areas (lower probability) can contain more valuable, more exciting prizes, treats, or privileges.*

*--Make sure the reinforcers are motivating for the group by letting them help you choose reinforcers on the spinner periodically.*

**Explaining and Giving Homework**

The homework component of this program is an essential element for the generalization of the newly learned social skills. The parents will need a set of materials to do the homework. These include the Superheroes' DVD, extra Superhero Power

Cards (in case of lost cards), and paper copies of the Social Story Comic Book Social Stories.

***Technique Tip:***

***Comic Book and Power Cards***

*Although the Comic Books and Power Cards can be printed at home from the CD, the appearance of the materials may be variable due to availability of color printers at home. Comic Books have the best appearance when printed double-sided, in full color on card stock. Power Cards are easiest to pull out of vinyl sleeves if they are printed on heavy card stock (over 110 lb. or "cover" stock). If all materials are printed in advance by the school or clinic, there is no need for parents have a CD to print materials from and all materials are equal in quality and appearance.*

In a separate meeting with all the parents of children in the group before the program starts, explain to them that at least three times a week they are expected to watch the Superhero DVD with their child for the skill that is currently being taught. They are also expected to help the child fill in the bubbles for the Social Story Comic Book that will be returned for review in the next group session.

Also, across the week ask the parent to catch (at least 3 to 5 times during the week) their child doing the appropriate social skill and mark a Power Charge on the Power Card. Both the Social Story Comic Book and the Superhero Power Card are returned for review in the second group session. All parents should receive the entire Homework Package (containing one Superhero DVD, 18 extra Superhero Power cards,

and 18 hardcopy Social Story Comic Books) at the special parent meeting before the training starts.

Remind the children that there are three ways to get more Power Charges:

- (1) Watch the DVD three times with their parents.
- (2) Fill in and color the back page of the Social Story Comic Book.
- (3) Practice their new skills at home and school.

When a child's teacher or parent "catches them" attempting or performing a social skill and applying each step, or doing the assigned homework, they will add Power Charges to their cards by filling in the circles on the card.

In the parent meeting, explain that, initially, children can get Power Charges for showing their parent or teacher partial skills until they can do the entire skill at once. After that, only entire skills can earn Power Charges. They can also get power from watching the DVD and working on the Social Story Comic Book at home. Emphasize it is important to bring the Power Card and Social Story Comic Book to the next meeting so they have a chance to increase their Power Charges, mark their Power Posters, and earn Scooter Cards.

When the Social Story Comic Book and Power Cards are returned after the second session and the next lesson set begins, they should be put in the student's Superhero notebook or folder. When the two lessons are over, the Power Posters from the wall should also be put in the student's notebook. Children may wish to keep their Power Cards with them to continue practicing skills, which helps them to continue to generalize their skills. As they continue in the program, they will earn a full deck of skill cards to

remind them of the skills they have learned. Over time, the notebook will be a record of the student's achievements and successes in the group.

### **Goodbyes**

Remind the children to work on their new skill during the week at home and at school so they can earn Power Charges on their Power Cards. They can only post Power Charges to their Power Posters if they remember to bring them next time!

#### ***Technique Tip:***

*Find a way to attach the Power Card to the child's backpack to ensure that it is available at home and school for parents and teachers to mark it, as well as return it to the next session. A second vinyl badge holder can be attached to the backpack or the original vinyl badge holder can be removed from the lanyard and clipped to the backpack. Many backpacks have small special pockets that might also be useful.*

APPENDIX G

SAMPLE LESSON

# SUPERHERO SOCIAL SKILLS

## Foundational Skills 1

### Skill 1: Following Directions

In order for a social skills curriculum to be successful in a group setting, it is important that facilitators gain instructional control of the group members from the first session. One of the most important elements of instructional control is the ability to get group members to follow directions.

This lesson is designed to teach the steps of listening when a person is giving you directions, agreeing to follow the directions, and complying with the directions right away. Although it is not critical to following directions, “look at the person” is given as the first step to establishing communication between two people. As the children perform these steps in role-plays, in free time, at home, and at school, they are reinforced by earning more power on Power Card #1, featuring the Initiator.

The video introduces and reviews each step and children are shown performing each step on the video. An important exception to the rule of following directions is also portrayed by children in the video. Children with autism spectrum disorders may not understand that some judgment is necessary when someone unfamiliar is trying to get them to do something that may not be okay.

#### Generalization:

Because following directions is a foundational skill, it is one of the four group rules. Explicit instruction in following directions will not be given after lesson 2, but the facilitators will have opportunities throughout the program to give praise and reinforcement (Scooter Cards) when this rule is followed. Teachers and parents can reinforce skill practice by “catching” a child following directions and marking Power Charges on the Power Card when the child is outside the group.



# SUPERHERO SOCIAL SKILLS LESSON PLAN

## Foundational Skills 1--Lesson 1

### Skill: *Following Directions*

**\*\*Prerequisite: Introduction Lesson**

<b>Objective</b>	Group members will be able to demonstrate the 4 steps to following directions within 3 to 5 seconds in the session, at home, and at school.	
<b>Rationale</b>	If you follow directions quickly, you will make the person happy and you will know how to do something correctly the first time. People will know that you are listening to what they are saying or asking you to do.	
<b>Steps to Following Directions</b>	<ol style="list-style-type: none"> <li>1. <i>Look at the person</i></li> <li>2. <i>Listen to their words</i></li> <li>3. <i>Nod your head or say okay</i></li> <li>4. <i>Do what the person asks right away</i></li> </ol>	<i>(Make sure to discuss situations where you don't have to follow directions—strangers, directions that would harm, etc. at an appropriate point)</i>
<b>Materials Needed</b>	DVD #1 FOLLOWING DIRECTIONS Lesson, DVD Player & TV or computer Power Card #1 Following Directions for each Power Poster #1 Following Directions for each Following Directions Scenario Cards Comic Book #1 Following Directions Scooter Cards, Black Hole Cards, lanyards, reinforcers, spinner, water-based markers	

### Starting the Lesson:

<b>Check in</b>	Review names, use name tags again if necessary.
<b>Daily Schedule and Group Rules</b>	Post schedule and rules <i>Remind them they can earn Scooter Cards for following rules, Black Hole Cards for not following rules.</i> <ol style="list-style-type: none"> <li>1. Get Ready</li> <li>2. Follow Directions (today's lesson)</li> <li>3. Be Cool</li> <li>4. Participate</li> </ol>
<b>Introduce New Skill And Power Card</b>	Skill: Following Directions (state rationale) <b>POWER CARD #1: FOLLOWING DIRECTIONS</b>
<b>Watch Video</b>	<b>DVD #1: FOLLOWING DIRECTIONS (Play All)</b>
<b>Role-plays</b>	<b>Option: Video-record role-plays for self-as-model DVD</b>  <ol style="list-style-type: none"> <li>1. Facilitator shows non-example, allow group to correct example  <i>A teacher (child in group) tells the class that it is time to clean off your desk and line up for recess. Facilitator (role-playing the student) does not comply. Exaggerate non-compliance of each step.</i> </li> <li>2. Facilitator does another example, this time a positive one.  <i>A teacher (child from group) tells a "student" (facilitator) to take out his/her</i> </li> </ol>

	<p><i>reading book and read quietly (facilitator complies). Show the steps clearly.</i></p> <p>3. Facilitator third example, a scenario when you DON'T have to follow directions. <i>Another child tells a "student" (facilitator) to give him his lunch money (bullying situation). Facilitator thinks out loud and decides he doesn't know or trust this person very well and does not comply.</i></p> <p>4. Group members take turns role playing scenarios with facilitator giving directions for them to follow  <b>FOLLOWING DIRECTIONS SCENARIO CARDS</b> can be used or children can make up their own  Facilitator emphasizes each step as it occurs, provides error correction</p> <p>5. As each child demonstrates the steps during role-plays, mark a power spot on the <b>POWER CARD #1</b>. <i>Emphasize that participating means they are following directions.</i></p>
<b>Social Story Comic Book On DVD</b>	<p>Watch the <b>DIGITAL COMIC BOOK on DVD #1, FOLLOWING DIRECTIONS LESSON</b></p> <p>The video will ask some multiple choice questions to fill in the blank bubbles. It will pause and give an answer, but explore other answers given with the group.</p>
<b>Social Game</b>	<p>Scooter Says (Simons Says)</p> <p><i>Facilitator can assist group members to take turns being "Simon" or "Scooter"</i></p>
<b>Free Time and Reinforcement</b>	<p>Incidental teaching and error correction. Provide games and toys for social play.</p> <p>Use <b>SCOOTER CARDS</b> (Write name on back) for following rules and following directions</p> <p>Use <b>BLACK-HOLE CARDS</b> for noncompliance</p> <p>Mark Power Cards as children show the steps to Following Directions</p> <p>At end of free time, draw a card for Superhero of the Day, have that child draw to see if group gets a reinforcer.</p> <p>Use <b>SPINNER</b> to determine <b>REINFORCER</b></p> <p><b>Options: Group Project Development time</b></p> <p><b>Examples: Develop own superhero—decide on a name and mission</b></p> <p><b>Put together video motivator project—decide on a title for video</b></p>
<b>Power Poster Update</b>	<p>Allow group members to update their <b>POWER POSTERS</b> with the Power Charges they have earned during role play and free time.</p>
<b>Explain Homework</b>	<p>1. Watch <b>FOLLOWING DIRECTIONS LESSON DVD #1</b> every day at home.</p> <p>2. Earn Power Charges on <b>POWER CARD #1</b> by following the steps at home and school.</p> <p>3. Have parents and teachers mark and sign the <b>POWER CARD</b>, <u>bring it back next time.</u></p> <p>4. Color in the <b>COMIC BOOK #1</b> and fill in the empty thought bubbles. <u>Bring it back next time.</u></p>
<b>Goodbyes</b>	<p>Time to provide <b>REINFORCERS</b> and transition out</p>

# SUPERHERO SOCIAL SKILLS LESSON PLAN

## Foundational Skills 1--Lesson 2

### Skill: *Following Directions*

**\*\*Prerequisite: Foundational Skills 1—Lesson 1: Following Directions**

<b>Objective</b>	Group members will be able to demonstrate the 4 steps to following directions within 3 to 5 seconds in the session, at home, and at school.
<b>Steps to Following Directions</b>	<ol style="list-style-type: none"> <li>1. <i>Look at the person</i></li> <li>2. <i>Listen to their words</i></li> <li>3. <i>Nod your head or say okay</i></li> <li>4. <i>Do what the person asks right away</i></li> </ol>
<b>Materials Needed</b>	<p>(Optional) Self-as-a-Model DVD from last week</p> <p>DVD #1 FOLLOWING DIRECTIONS</p> <p>Power Poster #1 FOLLOWING DIRECTIONS for each group member</p> <p>FOLLOWING DIRECTIONS Scenario Cards</p> <p>Comic Book #1</p> <p>Group board or card games and toys appropriate for age, toys</p> <p>Scooter Cards, Black Hole Cards, lanyards, reinforcers, spinner</p>

### Starting the Lesson:

<b>Check in</b>	<p>Update <b>POWER POSTER # 1</b> with the Power Charges from <b>POWER CARD #1</b> brought back by each group member. Ask each "how did it go?" Provide feedback if time allows.</p> <p><i>Gather information for scenarios to use during role-play</i></p> <p>Post <b>POWER POSTERS</b> in room</p>
<b>Go Over Daily Schedule and Group Rules</b>	<p>Post schedule and rules</p> <ol style="list-style-type: none"> <li>1. Get Ready</li> <li>2. <b>Follow Directions (today's lesson)</b></li> <li>3. Be Cool</li> <li>4. Participate</li> </ol>
<b>Review rationale and exceptions</b>	<p>If you follow directions quickly, you will make the person happy and you will know how to do something correctly the first time. People will know that you are listening to what they are saying or asking you to do.</p> <p><i>(Make sure you discuss situations when you don't have to follow directions)</i></p>
<b>Social Story Comic Book</b>	<p><b>COMIC BOOK #1</b> Look at the dialog that was completed in the empty thought bubbles as homework.</p> <p>(Facilitator checks dialog, does error correction now and during free time)</p>
<b>Digital Comic Book</b>	<p><b>Watch the DIGITAL COMIC BOOK #1</b> from <b>DVD #1</b>. <i>(Same as last time)</i></p>
<b>Optional:</b>	<p>Watch the <b>SELF-AS-A MODEL VIDEO</b> from last week's role plays</p>
<b>Role-plays</b>	<p>Facilitator pairs up children and has them role-play together, correcting each other</p> <p><i>Use <b>FOLLOWING DIRECTIONS SCENARIO CARDS</b> or suggest situations based on experiences reported during check-in</i></p>

	Option: video record for self-as-model again
<b>Games/Toys</b>	Encourage group members to pick a game or toy and some partners. Reinforce following directions skills during game-playing by marking <b>POWER CARD #1</b> with Power Charges.
<b>Reinforcement</b>	Give out <b>SCOOTER CARDS</b> (Name on back) for following rules, <b>BLACK-HOLE CARDS</b> for noncompliance Choose a card for Superhero of the Day, use <b>SPINNER</b> to determine <b>REINFORCERS</b> . <b>Options: Work on group project if you have one.</b>
<b>Power Poster Update</b>	Allow group members to update their <b>POWER POSTERS</b> with the Power Charges they have earned during role play and free time.
<b>Explain homework</b>	Read <b>COMIC BOOK #1</b> each night. Continue to earn Power Charges on <b>POWER CARD #1</b> from teachers and parents by following directions. Optional: Watch self-as-a-model DVD three times during the week with parents.
<b>Goodbyes</b>	Time to provide <b>REINFORCERS</b> and transition out

#### Troubleshooting:

If a child is not willing or able to follow the facilitator's direction by the end of Lesson 2, he or she needs to be pulled out of the group and go through the Get Ready program on an individual basis until instructional control is achieved.

Occasional instances of refusal to follow directions can be handled by issuing a Black Hole card that reduces the child's and the group's chances for a reinforcer at the end of the session.

Following directions can be encouraged by issuing Scooter cards for children who are following directions. If this is not enough to encourage other children to follow directions, make some of the Scooter cards BONUS cards (put a special mark on them) and give the child who earns the Bonus Scooter card an immediate reinforcer. Fade out the Bonus cards gradually as compliance becomes more consistent.

APPENDIX H

AUTISM SOCIAL SKILLS PROFILE

## Autism Social Skills Profile

*Scott Bellini*

Child's Name: \_\_\_\_\_  
FIRST MIDDLE LAST

Birthdate: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: Female Male Today's Date: \_\_\_\_\_  
MO. DAY YEAR MO. DAY YEAR

School: \_\_\_\_\_ Grade: \_\_\_\_\_

Your Name: \_\_\_\_\_  
FIRST MIDDLE LAST

Relationship to Child: Mother Father Guardian Other \_\_\_\_\_

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

The following phrases describe skills or behaviors that your child might exhibit during social interactions or in social situations. Please rate **HOW OFTEN** your child exhibits each skill or behavior independently, **without assistance from others** (i.e., without reminders, cueing and/or prompting). You should base your judgment on your child's behavior over the last **3 months**.

Please use the following guidelines to rate your child's behavior:

Circle **N** if your child **never** or **almost never** exhibits the skill or behavior.

Circle **S** if your child **sometimes** or **occasionally** exhibits the skill or behavior.

Circle **O** if your child **often** or **typically** exhibits the skill or behavior.

Circle **V** if your child **very often** or **always** exhibits the skill or behavior.

**Please do not skip any items.** If you are unsure of an item, please provide your best estimate. You may use the "Brief Description" section to provide additional information on the particular skill or behavior. For instance, if your child will exhibit a particular skill or behavior more frequently when cueing or prompting is provided, or when interacting with adults rather than peers, please make note of this in the "Brief Description" section.

## Autism Social Skills Profile

	Never	Sometimes	Often	Very often	
	N	S	O	V	
Skill Area	How Often				Brief Description
Recognizes the Facial Expressions of Others	N 1	S 2	O 3	V 4	
Recognizes the Nonverbal Cues, or "Body Language" of Others	N 1	S 2	O 3	V 4	
Requests Assistance From Others	N 1	S 2	O 3	V 4	
Understands the Jokes or Humor of Others	N 1	S 2	O 3	V 4	
Maintains Eye Contact During Conversations	N 1	S 2	O 3	V 4	
Maintains an Appropriate Distance When Interacting With Peers	N 1	S 2	O 3	V 4	
Speaks With an Appropriate Volume in Conversations	N 1	S 2	O 3	V 4	
Considers Multiple Viewpoints	N 1	S 2	O 3	V 4	
Offers Assistance to Others	N 1	S 2	O 3	V 4	
Verbally Expresses How He/She Is Feeling	N 1	S 2	O 3	V 4	
Responds to the Greetings of Others	N 1	S 2	O 3	V 4	
Joins a Conversation With Two or More People Without Interrupting	N 1	S 2	O 3	V 4	
Initiates Greetings With Others	N 1	S 2	O 3	V 4	

## Autism Social Skills Profile

Never	Sometimes				Often				Very often
N	S				O				V
Skill Area	How Often				Brief Description				
Invites Peers to Join Him/Her in Activities	N 1	S 2	O 3	V 4					
Joins in Activities With Peers	N 1	S 2	O 3	V 4					
Takes Turns During Games and Activities	N 1	S 2	O 3	V 4					
Maintains Personal Hygiene	N 1	S 2	O 3	V 4					
Interacts With Peers During Unstructured Activities	N 1	S 2	O 3	V 4					
Interacts With Peers During Structured Activities	N 1	S 2	O 3	V 4					
Asks Questions to Request Information About a Person	N 1	S 2	O 3	V 4					
Asks Questions to Request Information About a Topic	N 1	S 2	O 3	V 4					
Engages in One-On-One Social Interactions With Peers	N 1	S 2	O 3	V 4					
Interacts With Groups of Peers	N 1	S 2	O 3	V 4					
Maintains the "Give-and-Take" of Conversations	N 1	S 2	O 3	V 4					
Expresses Sympathy for Others	N 1	S 2	O 3	V 4					
Talks About or Acknowledges the Interests of Others	N 1	S 2	O 3	V 4					



## Autism Social Skills Profile

	Never	Sometimes	Often	Very often	
	N	S	O	V	
Skill Area	How Often				Brief Description
Provides Compliments to Others	N 1	S 2	O 3	V 4	
Introduces Self to Others	N 1	S 2	O 3	V 4	
Politely Asks Others to Move out of His/Her Way	N 1	S 2	O 3	V 4	
Acknowledges the Compliments Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Allows Peers to Join Him/Her in Activities	N 1	S 2	O 3	V 4	
Responds to the Invitations of Peers to Join Them in Activities	N 1	S 2	O 3	V 4	
Allows Others to Assist Him/Her With Tasks	N 1	S 2	O 3	V 4	
Responds to Questions Directed at Him/Her by Others	N 1	S 2	O 3	V 4	
Experiences Positive Peer Interactions	N 1	S 2	O 3	V 4	
Compromises During Disagreements With Others	N 1	S 2	O 3	V 4	
Responds Slowly in Conversations	N 1	S 2	O 3	V 4	
Changes the Topic of Conversation to Fit Self-interests	N 1	S 2	O 3	V 4	
Misinterprets the Intentions of Others	N 1	S 2	O 3	V 4	

APPENDIX I

POWER CARD EXAMPLE (ENLARGED)

**Get Ready!**

- 1. Get Ready!**
- 2. Feet and hands down.**
- 3. Be quiet.**
- 4. Look at the teacher.**
- 5. Count to 3.**

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